

Variations2: IU Digital Music Library First-Round Usability Test Report September 5, 2002

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Executive Summary

During July 2002, the first round of usability testing was conducted on a prototype of the Variations2: IU Digital Music Library system version 1.0 (V2). The V2 project aims to establish a digital music library testbed system for the purpose of examining dissemination of digitized music in a variety of formats (for more information about the V2 initiative see <http://dml.indiana.edu/index.html>). V2 is an extension of the current Variations system in place in the IU Cook Music Library which provides access to over 7000 titles of near CD-quality digital audio to users at computer workstations (for more information about Variations see <http://www.dlib.indiana.edu/variations/>).

Eleven students worked through a series of scenario-based tasks using V2 at the Usability Lab at Indiana University's School of Library and Information Science (SLIS). The main purpose of the formative evaluation was to investigate the work flows and needs of typical V2 users during tasks such as searching for and playing listening selections, viewing scores, bookmarking, and utilizing help. Additional goals included uncovering general design usability issues and assessing users' levels of satisfaction with V2 (as opposed to the current Variations system).

Results of the sessions revealed that users were generally impressed with V2's features. Most enjoyed the functionality of the media player, finding it easy to manipulate; others liked the presence and flexibility of the score viewer. The ability to jump quickly to particular spots in a listening piece or score was mentioned as an advantage as was the high quality of the audio recordings. The most severe usability issues were apparent in the processes of entering and retrieving search queries, bookmarking, and controlling scores. For example, users often had difficulty choosing a piece from among search results for "listening" as opposed to "viewing". With regard to bookmarking, functions such as drag-n-drop, button text interpretation, visibility of update results, and bookmark placement and editing presented difficulties. In both the player and score viewer windows, users infrequently noticed the Work tab, which led to task completion errors. Once pointed out, many users were further confused about the connotation of the word "Work". In addition, resizing and changing the presentation of scores was confusing for some users. Suggestions for redesign and improvements based upon areas in which the V2 system met or fell short of the users' work needs are offered.

Table of Contents

I. Purpose of the Study	1
II. Participants.....	7
III. Method.....	8
IV. Findings	9
Overall	9
Task Times	9
Satisfaction Ratings	10
Searching for Selections	12
Playing Selections	15
Viewing Scores	17
Bookmarking.....	18
Help Page	20
V. Recommendations	21
VI. Discussion	26
VII. Appendices:	
A – Data Collection Instruments	
Demographic Questionnaire	27
Satisfaction Survey.....	28
Debriefing Questions.....	30
B – Usage Scenarios	
Music Student.....	31
Non-music Student.....	33

I. Purpose of the Study

The Variations2: IU Digital Music Library project (V2) aims to establish a digital music library testbed system containing music in a variety of formats. The first version of Variations2 is due for release in early September, 2002. The current Variations system is used primarily by music students to listen to CD-quality recordings online at computer workstations in the IU Cook Music Library.

This formative usability test examined a high-fidelity, working prototype of the V2 system. The purpose was to investigate the work needs of users in tasks such as searching for and playing listening selections, viewing scores, bookmarking, and utilizing help. The evaluation was conducted in light of the following goals:

- Determine what problems users have when searching for selections;
- Determine what problems users have when accessing listening selections with the media player;
- Observe which modes of media playing users prefer;
- Observe which methods of score viewing users prefer;
- Determine what problems users have when accessing scores;
- Determine which media player/score viewer components are used/ignored when listening to a selection;
- Test for ease of navigation amongst different player windows;
- Determine whether bookmarks help or hinder a listening experience;
- Identify bookmarking functionality problems;
- Determine whether current help page contains appropriate and easily accessible help topics;
- Monitor problem areas to determine which need to be added to the help page;
- Gauge users' levels of frustration and/or satisfaction with V2.

Variations2 System Components

Search Window

The first step toward listening to a musical selection or viewing a score is to enter a search query in the search window. The search window offers 3 tabbed options for inputting queries: Basic, Advanced and Keyword (not enabled for this test). The Basic tab invites users to input queries for common information such as composer or piece title. In addition, users may select the type of recording format they want to search for as well as keys. The Advanced tab allows inputs of more specific information such as publisher or Library of Congress subject heading. Figure 1 shows the initial presentation of the Basic tab search window.

The quickest path to take to get to a selection for listening or score viewing is to click on the "Select" link next to the search result number. Alternatively, users may click on links for a specific piece or composer and get to further content via a dropdown menu which appears and asks users how they would like to continue their query.

Once a query has been inputted, Variations2 will return a list of results as shown in Figure 2. In this case, the query tried was Creator = Beethoven; Work Title = Symphony; Key = "A" and "Major"; Media Format = "All Recordings". Depending on the degree of search query, users may then select a blue underlined link to narrow the results by composer or piece, or choose to read more information about a composer or piece.

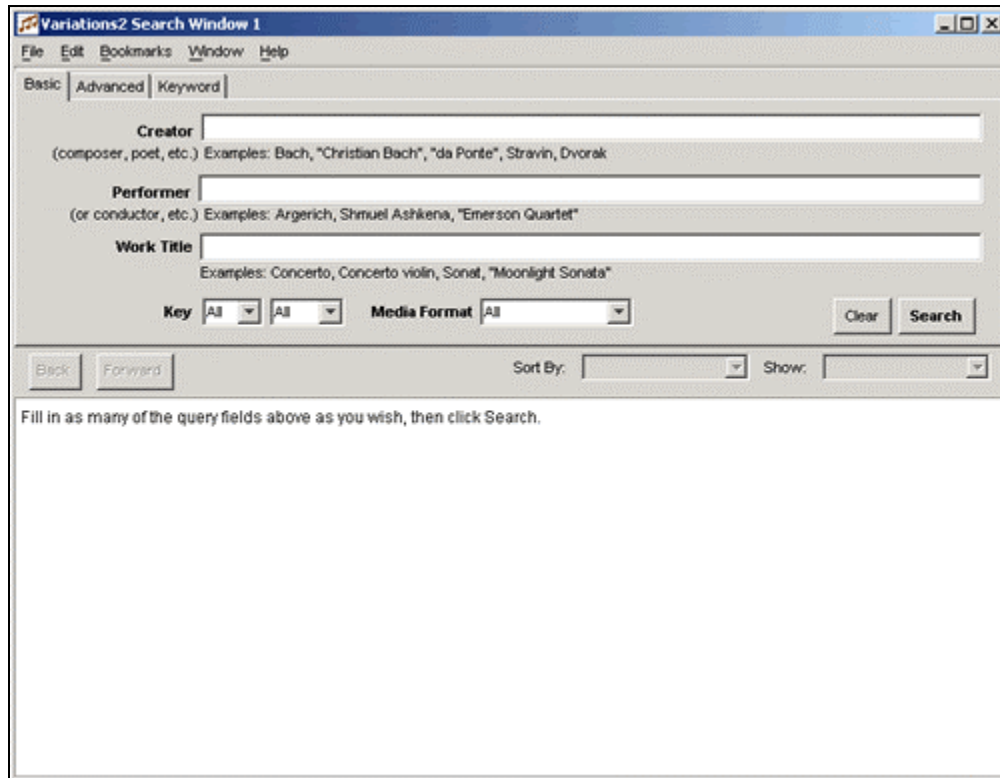


Figure 1 – “Basic” Search Window

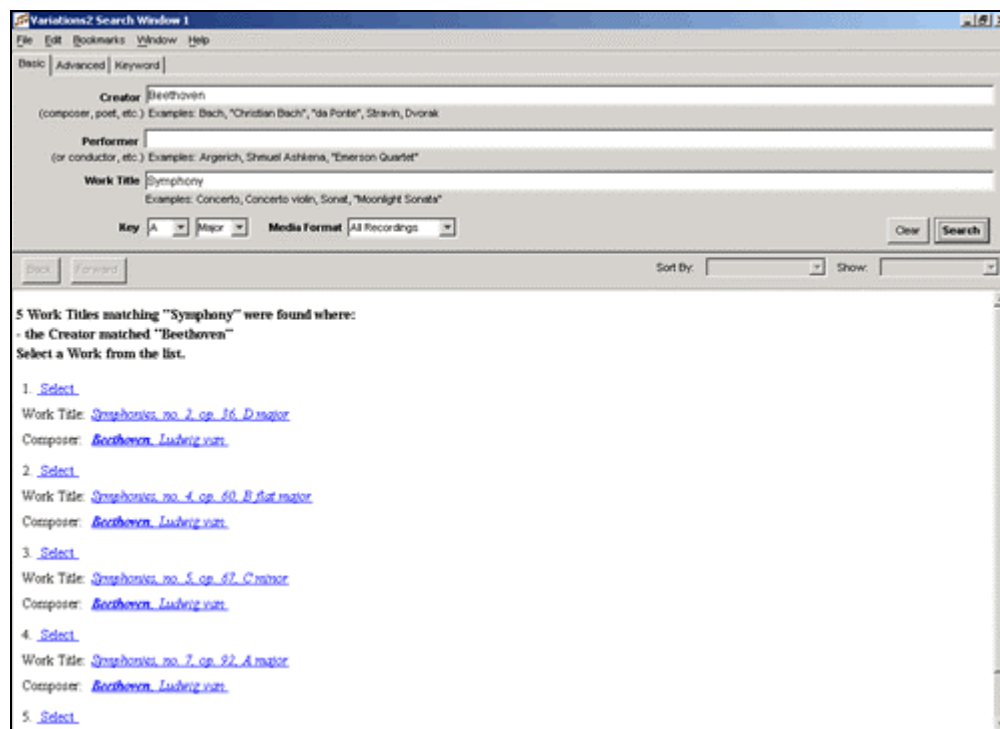


Figure 2 – Sample Search Results List

Player Window

The player window provides mechanisms for playing and listening to musical selections. It contains a media player which offers standard controls such as play, pause, and stop. Figure 3 shows the initial presentation of the media player.

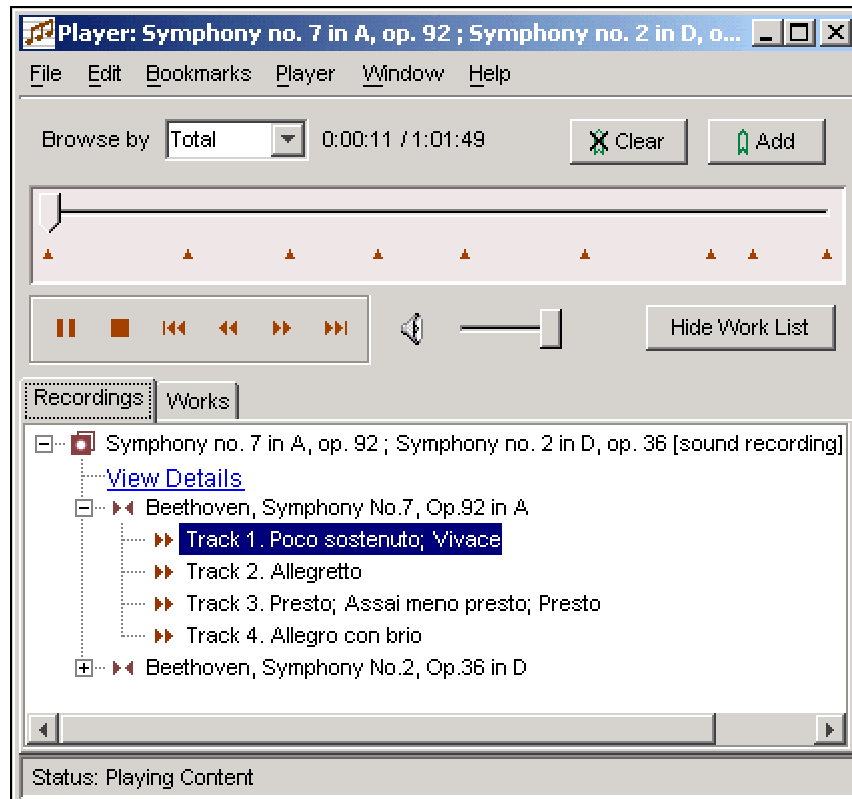


Figure 3 - Initial Presentation of the Media Player window.

Users may jump to various sections of the piece based upon the recording structure (e.g. tracks) using the Recordings tab, or the work structure (e.g. development, exposition) by selecting the Works tab. "Browse by" options (Total, CD/Side, Track) allow a user to narrow or widen the slider bar contents and thus manipulate the range of selection for bookmarking (see Bookmarking below). Figure 4 shows the player window with the Works tab visible, "Browse by" track option selected, as well as a bookmark placed at 5:26 [mm:ss].

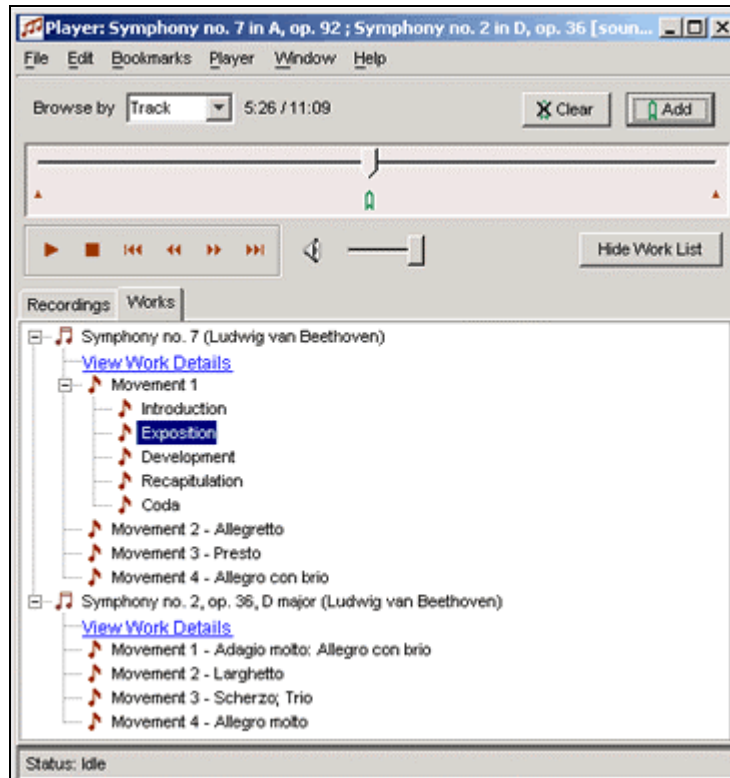


Figure 4 - Media Player with Works tab visible, Browse by Track selected and a bookmark on the track at 5:26.

Score Viewer Window

With the score viewer, one can listen to a selection and follow along on the score at the same time. As with listening selections on the Media Player, spots in scores can be bookmarked for future use. The Score tab allows users to jump to pre-determined score sections such as Table of Contents and Instrumentation; the Work tab allows users to jump to sections of the score based upon score structure (e.g. development, recapitulation). In addition, score views can be changed according to preferences using features such as Zoom In and Out, 1- or 2-page view, and Compact vs. Full View. Figure 5 displays an example of the 2-page score view for pp. 13-14 of *Beethoven's Symphony No. 7 in A Major, Op. 92*. Figure 6 displays the score viewer with the Score structure tab chosen as well as Edit Bookmarks Menu and a bookmark for "Page 13" selected.

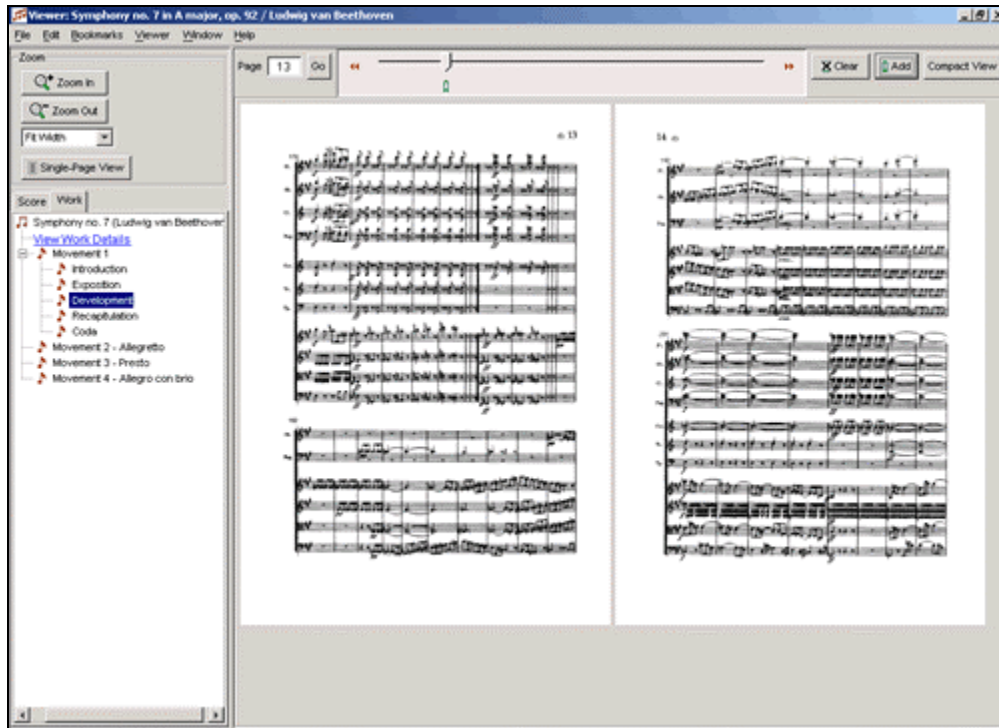


Figure 5 – Score Viewer Window with Two-Page View and Work tab options selected and a bookmark placed at p. 13.

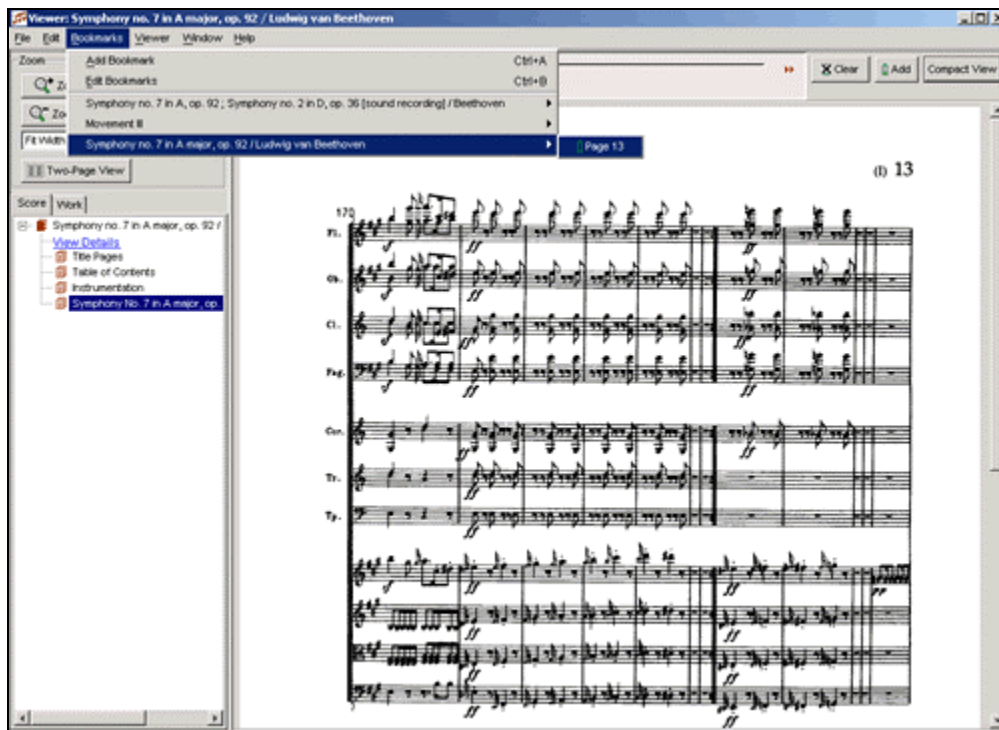


Figure 6 - Score Viewer Window with Score tab selected and the existing “Page 13” bookmark selected on the Bookmarks menu.

Bookmarking

Bookmarking provides a way to mark certain pieces or places within pieces for later reference, similar to bookmarking web pages. Bookmarks are automatically saved so they will be available for subsequent uses. Bookmarks may be edited, deleted or organized into folders using the "Edit Bookmarks" window available from the Bookmarks menu. Figure 7 below shows the "Edit Bookmarks" window used in this test. Bookmarks are organized in folders which have a hierarchical structure. Folders may be collapsed or expanded to hide or reveal their contents.

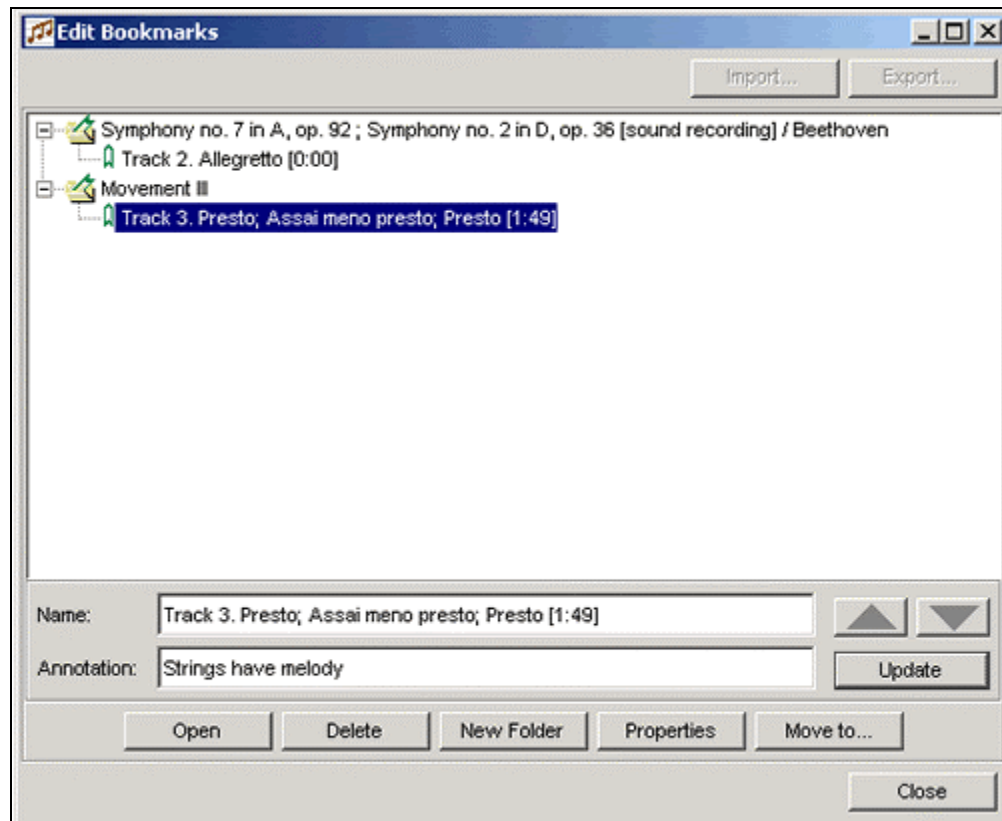


Figure 7 - Edit Bookmarks Window

Help System

The help page is currently a single web page divided into major sections in Q & A format. It is available from any V2 window by clicking the Help menu and selecting the "Variations2 Help Page" option. Based upon data from this test, help topics will be added and/or deleted from this page. The eventual goal is to present contextual help topics (e.g. hovering tips), help pages devoted to each system component (e.g. media player, score viewer), and a searchable help topics index. The help page used in this test may be viewed at

<http://ella.slis.indiana.edu/~mbswan/DML/helpsystem.html>.

II. Participants

Two groups of participants were recruited: 7 music majors (MUS) and 4 non-music majors (NON). Music students were recruited by the facilitator from summer II session music classes (M410, M502, T511). During recruitment, the facilitator explained the purpose of the study and passed around a sign-up sheet specific to the class. Those students who were interested in participating wrote their names and emails addresses and available times on the sheet. The facilitator then contacted them at a later time to set up session times.

A second group of four non-music students was recruited by Mark Notess from his usability workshop which ran from July 20-August 3, 2002. These participants filled the role of generic library patrons who may also casually use Variations. The first non-music student session was conducted as a pilot test. More information about the pilot test may be found in the **Pilot Test** section in section **III. Method**.

Participants had assorted ages and various levels of experience with computers. A summary of the relevant demographic characteristics of participants is shown in Tables 1a and 1b.

Demographics Summary

Table 1a: Non-music Major Demographics

#	Gender	Age	Major	Computer Use (hrs/wk)	Computer Experience (1=novice - 5=expert)	
					PC	Macintosh
1	M	29	MIS	11-20	4	2
2	F	24	MIS	20 or more	4	4
3	M	30+	MLS/MIS	6-10	4	3

Table 1b: Music Major Demographics

#	Gender	Age	Major	Computer Use (hrs/wk)	Computer Experience (1=novice - 5=expert)	
					PC	Macintosh
1	F	21	BM-Piano Performance	11-20	3	3
2	M	21	Jazz Studies	11-20	3	1
3	M	26	DM-Tuba Performance	6-10	3	2
4	M	21	Music Performance	0-5	2	1
5	M	30	Music Education	6-10	3	1
6	F	43	DM-Voice Performance	6-10	2	1
7	F	26	MM-Voice Performance	11-20	3	3

None of the non-music majors had ever used Variations. Six of the music majors indicated that they had used Variations previously in the music library labs. A

summary of the Variations usage frequency and activities for music majors is shown in Table 2.

Table 2: Music Majors Variations Use

#	# times/wk	Activities
1	1-5	Reserve List
2	1	Reserve List
3	Never	---
4	1-5	Class work; Performance Preparation
5	+5	Class Reserve List
6	1-5	Class reserve list; Items found in IUCAT
7	+5	Class reserve list; Recital preparation; Personal listening; Looking up dates of recordings, etc.

III. Method

All test sessions were coordinated by the facilitator. Upon each student's arrival at the SLIS usability lab, the facilitator explained briefly the purpose of the usability test and also made sure that participants were comfortable with the set-up of the lab. Participants were then seated at a PC (set to 1024x768 resolution) and read an introductory script. At this point, the facilitator double clicked on a V2 shortcut icon to pull up the search interface on the computer screen. Participants were then briefed about the function of the search interface and told that the content was "dummy" content. Participants were then instructed about the procedure for task completion and presented with the appropriate scenario sheet (music or non-music; see Appendix pp. 31-34). Next, each participant filled out a demographic questionnaire (see Appendix p. 27) and then immediately proceeded to attempt to complete each set of tasks while thinking aloud. Audio as well as computer screen interactions were videotaped for future analysis. After the tasks were completed to the best of the participant's ability, the participant filled out a V2 satisfaction survey (see Appendix pp. 28-29). After the participant completed the survey, the facilitator then asked a few debriefing questions (see Appendix p. 30) based upon observations of the participant's task completion activities. Finally, the facilitator thanked the participant for participating and answered any questions about the testing procedure that the participant might have had. Participants were not compensated for their participation.

Pilot Test

The first session (non-music major) was run as a pilot test. After the pilot, a few minor changes were made to the wording of the music and non-music scenario tasks. For example, in section A., task 6, the word "Pause" was changed to "Interrupt" so that it would not be leading. In section C., tasks 7 and 9, "Label" was changed to "Add the comment". In addition, it was decided to give future participants a lengthier introduction to the system. Henceforth, participants were told that the system contained "dummy" content and that search queries that would normally work might not in this situation. The sequence of the session components remained unchanged. Some qualitative (verbal comments, task actions) data from the pilot are included in this report; quantitative data (task times, satisfaction ratings) are not included.

IV. Findings

Overall

Overall reaction to the system generally indicated that users were happy with the system performance and would be likely to enjoy using the system once it was in place, especially to view scores. Some positive comments included, "Um, it wasn't too bad," "I thought it was pretty cool. It was pretty easy," and that it was visually easy to understand. One user thought the whole concept of being able to search and listen was the best thing about V2. Others felt that after a few tries, processes that were difficult initially would be easier: "Once you get the hang of it, it'd be easy." Specific components that garnered mostly positive comments included the media player controls, the score viewer presence, the ability to jump to specific parts of recordings and scores, and ease of navigating the help page. Negative comments were made in the areas of bookmarking, score manipulation, forming search queries, and navigating through search results. Finally, although no satisfaction questionnaire comments addressed the look of the interface, one user felt that it looked dreary and depressing because the "color is all gray."

Task Times

Overall task times for participants who had used Variations previously are compared to task times for participants who had never before used Variations. As described in Table 2, six subjects had prior experience with Variations. Table 3 presents the overall task times for both groups. The average task times for both groups were fairly close at 34:41 and 35:44. The lengthiest task times were for NON-3 and MUS-1. A possible cause of this for NON-3 includes his time spent on the help page looking for an answer to an unrelated task question; MUS-1 spent a lot of time trying to resize the score and turn pages. Task times presented in Table 3 are not definitive statements about the ease of use of V2. Many confounding variables were present that could have affected task times. For instance, non-music majors could simply have been less interested in the program and less likely to explore the interface.

Table 3 – Comparison of task times for users with "No Prior" vs. "Some Prior" Variations use.

Variations Use	Overall Task Time	Participant	
		Group	#
No Prior	41:10	NON	1
	24:28	NON	2
	52:58	NON	3
	20:09	MUS	3
Average Time	34:41		
Some Prior	51:34	MUS	1
	19:17	MUS	2
	34:15	MUS	4
	32:57	MUS	5
	35:50	MUS	6
	40:36	MUS	7
Average Time	35:44		

Satisfaction Ratings

Participants were asked fill out a 17-question Satisfaction Survey (see Appendix, pp. 28-29) and rate their experience with V2 by circling a number on a 1-7 continuum for each question. Question topics ranged from general system satisfaction to inquiries about specific V2 components and processes such as bookmarking and viewing scores. Positive adjectives were placed at the low end of the continuum (1) while negative adjectives were placed at the high end (7). Thus, a higher mean score for a particular question indicates a lower satisfaction rating. Consolidated results of the satisfaction ratings are presented in Table 4. Questions 14 and 15 pertaining to the help system also had an option of Not Applicable (N/A) in case participants did not open the help page. Non-music major (NON) responses are marked with an "o"; music major (MUS) responses are marked with a "♦". Mean scores are also shown for NON and MUS groups as well as a combined satisfaction mean for both groups which is shown in the COM column.

Overall, participants expressed high satisfaction with using V2 and its components, although non-music majors indicated that they found the system slightly less satisfying than the music majors. Non-majors and music majors fell in the middle with regard to perception of the appropriateness of search results (NON mean of 3.67; MUS mean of 3.57). Unsurprisingly, non-music majors also expressed that they would be fairly unlikely to use V2 for online score viewing (mean of 6.33) as opposed to music majors, who indicated that they would be more likely to use V2 for that purpose (mean of 3.14). For music majors, mean ratings indicating lower satisfaction were assigned to: making and using bookmarks to compare different types of musical formats and examples (3.86); appropriateness of search term results (3.57); and finding additional information about composers (4.14). All music majors indicated a high level of intention to use V2 for online listening (all ratings were a 1 or 2) while they were split on viewing online scores (4 below the mean and 3 above). One potential reason for higher music major satisfaction with the system may be simply more familiarity with the system; additional testing would certainly be necessary in order to explore this idea further.

Table 4: Satisfaction Survey Ratings for Variations2

Question	Rating							Mean Scores		
	1	2	3	4	5	6	7	NON	MUS	COM
1. Please rate your overall reaction to using the Variations2 system:	Satisfying			Disappointing				4	2	2.6
	♦	o	♦	o		o				
2. Using the media player controls to select different <i>movements</i> of a work was:	Easy			Difficult				2.33	2.14	2.2
	o	o	♦	o						
3. Using the media player controls to select specific <i>tracks</i> to play was:	Simple			Hard				2	2	2
	o	o	o		♦					

4. Getting to the pages in a score that I wanted to view was:	Straightforward						Tricky		3.33	2.86	3
	○	◆	○	◆		○	◆				
5. I would use the score viewer to examine the details of a piece's orchestration:	Always						Never		2.67	3.29	3.1
	◆	○	○		◆	◆					
6. The process of bookmarking spots in my listening selections was:	Straightforward						Confusing		2.67	3.14	3
	○	◆	○	○			◆				
7. Making and using bookmarks in order to compare different types of musical formats and examples would be:	Enjoyable						Frustrating		2.67	3.86	3.5
	○	◆	○	○	◆	◆					
8. The prospect of using bookmarks to do detailed listening is:	Appealing						Unappealing		1.67	3.14	2.7
	○	○	◆	◆	◆						
9. Entering search terms produced results that I expected:	Always						Never		3.67	3.57	3.6
		○	◆	○	○						
10. The format of the search results list was:	Self-explanatory						Unclear		3.33	2	2.4
	○	◆	○			○					
11. Finding additional information about composers was:	Trouble-free						Difficult		2.67	4.14	3.7
		○	◆	○	◆	◆					
12. Clicking on links in my search results list led to outcomes that were:	Expected						Surprising		3.33	2.86	3.0
		○	◆	◆		○					
13. Switching between screens (search window, media player, score viewer) was:	Uncomplicated						Tedious		1.33	1.86	1.7
	○	○	◆		◆						

14. I found the help page content:	Helpful			Inadequate			1.5	1.5	1.5
	○ ◆ ◆ ◆	○	◆				(n=2; 1 N/A)	(n=4; 3 N/A)	(n=6; 4 N/A)
15. Navigating the help page content was:	Easy			Difficult			2	1.75	1.83
	○ ◆ ◆ ◆		○	◆			(n=2; 1 N/A)	(n=4; 3 N/A)	(n=6; 4 N/A)
16. Once Variations2 is implemented, how likely would you be to use the system for <i>online listening</i> ?	Likely			Unlikely			3	1.29	1.8
	○ ◆ ◆ ◆ ◆ ◆	◆ ◆	○		○				
17. Once Variations2 is implemented, how likely would you be to use the system to <i>view online scores</i> ?	Likely			Unlikely			6.33	3.14	4.1
	◆ ◆ ◆		◆		○ ◆ ◆	◆ ○			

Searching for Selections

The process of inputting search queries presented various difficulties for first-time users. After a few tries, though, most users were able to overcome any initial difficulties and work through the search sequence quickly. Although users were often annoyed at not being able to use the wheel button on the mouse to scroll through results lists, the ability to quickly get to a listening selection or online score was the most often cited advantage. Further, many requested that more functions, e.g. back and forward actions, be right-click enabled. Additional prevalent issues associated with searching for and choosing selections are described below.

Entering Queries

Users entered search queries in a number of ways. Most used only the Basic search tab. The two users who went to the Advanced tab did so in one case out of frustration with the query in task C not working, and to input a Publisher name for task B in another. When entering a search query, users frequently tried to type in the entire name of a piece (e.g. "Music for the theatre"; "Symphony No. 7 in A Major") and only the last name of a composer (e.g. Copland). Since the content in the system is "dummy" content, many search queries that might have worked ordinarily did not work in this test. This caused some frustration, and several interventions by the facilitator were necessary, especially for task C. Some users put in minimal search queries (few fields) while others tried to start out very narrow by entering as much information as possible including full composer name and key signature.

When asked their opinions about inputting queries, users had mixed feelings. On one hand, some felt that the query process was easy. For instance, MUS-4 commented, "It just makes you feel like you're gonna get what you want. I didn't have any trouble putting things in and getting what I wanted." Similarly, when asked what the easiest component to use was, MUS-3 declared, "The search page. It was easy to

pick out publisher, performer....” On the other hand, some felt that the process of inputting queries was more cumbersome. For example, user MUS-6 consistently tried to input queries which followed IUCAT query syntax (e.g. for task B. she tried “Symphon?” in the Title field) with no luck. Although she was frustrated by this and claimed that inputting search queries was the most difficult component of V2 to use, she expressed satisfaction with the system: “It was a little frustrating for me that it wasn’t responding to my search the way that IUCAT responds...but, it seemed pretty handy.” NON-2 least liked the “annoying search” and felt that narrowing down searches was the hardest component to use, especially “...when there are many pieces returned that are similar to one another.” She also anticipated that it might be difficult to maneuver through results for composers with large bodies of works.

Navigating Results Sequences

Selecting choices from the search query results list was sometimes a roundabout process, as there are several ways to get to content. The Back/Forward buttons had not yet been enabled and so users had to press Search again and/or enter a new search query to start over if they wanted to return to a previous results list page to narrow in a different manner (e.g. go back and select a different composer or recording).

For this test, search sequences took one of the following paths:

A)

1. Enter a query.
2. Query returns a list of pieces which match or closely match the query (see Figure 9).
3. User clicks on the name of the piece to get to the available recordings for that specific piece.
4. User selects a piece for listening or score viewing.

B)

1. If the search query includes a composer name which may have several possible matches (e.g. Bach, which may be J.C. or J.S.) the system first returns a list of closely matching composers from which the correct composer is chosen.
2. The subsequent screens allow the user to narrow to the actual recordings/scores wanted for that composer using the same sequence as in path A starting at step 2.

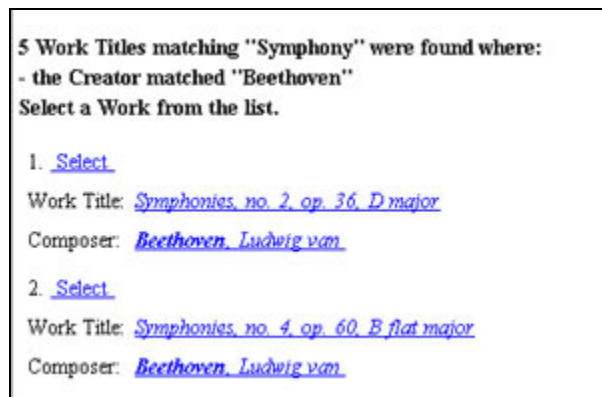


Figure 8 – Typical format of results list. Users may narrow a search by clicking on the “Select”, Work Title or Composer links.

Once a query has been submitted and results returned, the quickest path to the desired composer and subsequent selections for listening or score viewing is to click on the "Select" link next to the search result number. Alternatively, users may click on links for a specific piece or composer and get to further content via dropdown menu choices (see Figure 10).

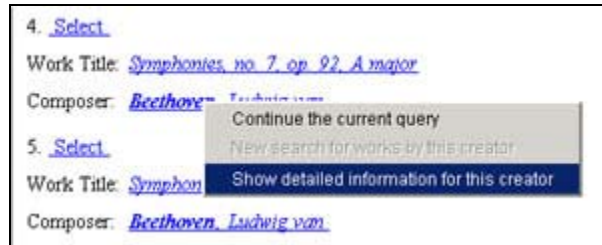


Figure 9 – Selection of a Work Title or Composer link produces a dropdown menu of choices.

Users tended not to use the "Select" link. Instead, they were drawn immediately to click on the link to the actual piece or composer they wanted to access, possibly because choosing a link is more cognitively direct. When asked about this, user MUS-5 said he went "...right to the links on the search interface". Those who chose work or composer links instead of "Select" had an extra step to get to a recording or score as they then were presented with a dropdown list of choices from which they had to select "Continue the current query" in order to continue along their path.

Besides being an extra step, the dropdown list hindered task completion for users due to the fact that it is unexpected that a hyperlink would produce a dropdown menu when clicked. MUS-1 did not understand the difference between the two menu options that appeared when she clicked on a work title. Both the pilot user and NON-1 least liked the feature of clicking on the link and seeing the two dropdown options. Other comments included, "I'm not sure when this pops up what I'm supposed to select here," and "Search interface dropdown was too much." Only three of the eleven users correctly answered task B3 which asked how many variant names there are for Beethoven. Completion of this task required that users click on the Beethoven composer link and then select the "Show detailed information for this creator" menu choice. One user who did click on Beethoven simply did not select the correct menu choice; she picked the top one, "Continue the current query." When the variant names did not appear she did not re-click the Beethoven link and select the proper menu choice, but instead proceeded to input as many variations of Beethoven as she could think of into the Creator field and do searches for those! Another user suggested as well that, "You could try different names-different spellings." Others who got it wrong simply assumed that there were no variant names for Beethoven and gave up. The three users who did get the answer went immediately to the Beethoven link and selected the correct menu option.

Users also tended not to read the results lists messages (see Figure 11) detailing the contents of the results list. When they did, they often glossed over the specifics (e.g. "3 Recordings and/or Scores") and instead scrolled to explore the contents. This behavior led to frequent wrong answers for task B2, which asked, "How many scores for ... are available for viewing?" Users tended to answer "3" based upon the results message which said, "3 Recordings and/or Scores..." while the correct answer was "1". Several users who immediately answered "3" later changed their answer to "1" when they had to view a score in task B5.

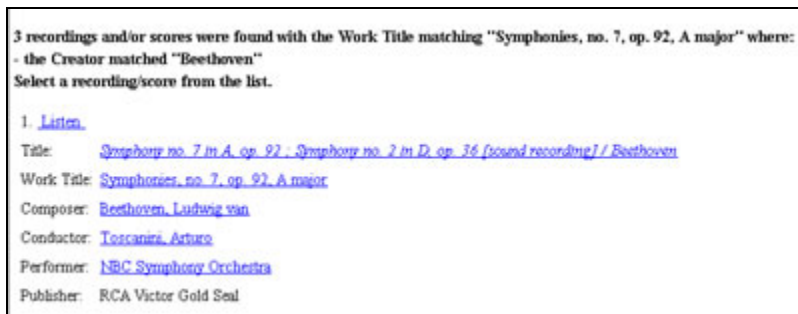


Figure 10 – List of available recordings/scores for a selected Work Title.

As shown in Figure 11, users have the option to select "Listen" to go to the media player. Not shown is another link option, "View", which opens a score for that piece. Some users went directly to "View" and opened the score with no problem. Others, though, were not so quick to retrieve the score. As these users scrolled through the results to find the score in task B5, those who did not immediately recognize the distinction between "Listen" and "View" could not quickly find the score. Many tried entering new search queries in attempt to narrow to a score and two users even clicked on the "Listen" link to try to find the score. NON-1 had problems, commenting, "Not sure where to find this..."

Playing Selections

Several users commented that the media player was the easiest component of the system to use for various reasons. MUS-1 thought the controls were easy to use in accordance with NON-1 who commented, "This is fairly standard and [the controls] are big enough to where I can see them," and NON-2 who felt the media player symbols were standard. MUS-3 felt the media player itself was "fun" and MUS-4 felt that, "Because of the old Variations....it's easier to get to different parts...." This user liked being able to jump to tracks and visualize the tracks all in one window, unlike the current Variations system. This feeling was shared by MUS-5 who liked being able to jump around from CD to CD or track and MUS-7 who thought "Getting to the different movements of the piece was really easy." Still others liked the immediacy of playback. One bug with the system caused some task completion issues. The problem occurred when users clicked on a track for playback which was not the first track on the recording. The system defaulted always to the first track on the recording instead of playing the correct track.

Recording Times

One of the biggest problems with the player related to ascertaining playback times. Several users found it difficult to answer tasks related to recording, CD and track times. Tasks where this difficulty was encountered included:

- A8 - how long is a particular section?
- C2 - how long is the total recording?
- C4 - how long is the CD?

The easiest path toward completion of these tasks necessitated changing the selection in the "Browse by" dropdown and then observing the change in the time display to the right of the dropdown (see Figure 12). The dropdown options include Total, CD/Side and Track. The default setting is Total. The left side time indicates the point at which the slider is currently resting. The right side time reflects the total

time for the particular dropdown choice. In Figure 12, then, the time indicates that the slider is at minute 11:09 of the Total recording (which may include more than 1 CD) time which is 1 hour, 1 minute and 49 seconds.

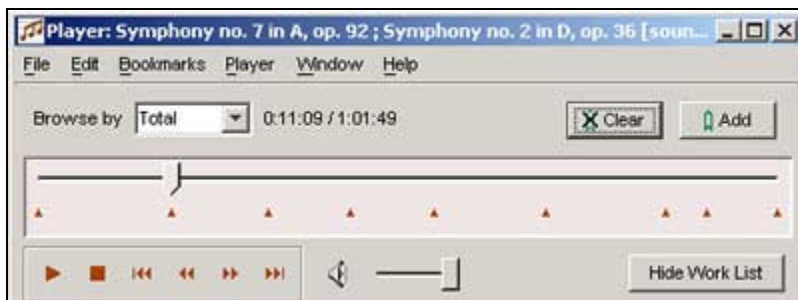


Figure 11

Users attempted many routes toward completion of the above tasks. MUS-1 tried manipulating the Hide vs. Show Work List in order to find the track time for task A8 and then incorrectly answered the task, assuming that the track time was the CD side time. NON-3 also used the Show Work List in order to figure out the track time for task A8 and then answered 0:47 which was not the track time, but instead the current start time indication. User MUS-4 attempted to figure out the track time in task A8 by observing the previous track end time and the subsequent track start time and "guessing" the time of the track in between. User MUS-6 was observed trying to click on the slider bar in order to see the track times because she was used to the way the current Variations system displays track times: "I like to have a visual representation right up in front of me, of, um, what the movements are and what length they are so I can hop ahead to different movements. That was something that I miss a little bit that I like in Variations...is having the timing of the track that I'm on automatically in front of me." Finally, user MUS-7 did click on the dropdown but did not select track, and eventually gave up on this task. For task C2, users MUS-4, MUS-6 and NON-2 added both CDs on a recording together to find total recording time instead of selecting the Total dropdown. Some simply answered C2 incorrectly, assuming that the Total recording time equaled the CD/side time and moved on.

Work Tab Visibility

Another major issue with the player was the fact that users did not see the Work tab. The Work tab contains a structure underneath which allows users to immediately jump to sections of a work such as Exposition or Development. Task A8 asked how long a particular section was. Users mainly chose to use the Recordings tab to find the answer, presumably because the sections for that particular piece were parallel to the tracks. However, users could have selected the Work tab and seen the specific section title the task referred to. When asked about this later, most users said that they did not see the Works tab ("I didn't realize the Works part right away....But the fact that it's all lined up for you is kinda nice.") or did not associate the heading "Works" with the type of structure that was underneath the tab.

Miscellaneous

A few other issues were apparent from user interactions with the player. Most users tended to not resize the player window from the default and instead scrolled up and down longer recordings lists. Also, it was not immediately obvious to some users that the orange arrows on the slider aligned with the recording structure (tracks) listed below. As well, clicking on an arrow on the slider bar did not move the playback right

to the selected arrow/track but only gets it "close". Therefore, to get directly to the start of a particular track, users had to select the track name from the list underneath the slider and press play or double-click the track name.

Viewing Scores

Overall, users were impressed with the capability of the score viewer. Several commented that the score viewer was their favorite component and that it was the easiest to use:

- "I think the score was the easiest part, because you can just....If you can remember what page, or whatever, you can just type the page in. I could follow it. It was clear." (MUS-4)
- "I liked being able to get around to the table of contents, um, and the score information...." (MUS-6)
- "I think it's really cool that you can do all the detailed stuff with the score." (MUS-7).

One user felt that the score viewer was the most difficult aspect of V2, noting that, "For me, I kept changing screen size. I couldn't find the size that fit," and another user felt that, "Getting to the right place in the score" was what she liked least about V2.

Turning Pages

Most page turning issues were minor. Although most felt that page turning "works really well" (NON-2), and liked the ability to jump quickly to different score sections (MUS-7), some encountered a few difficulties. Users explored all methods for turning pages, including entering page numbers into text box and pressing "Go"; moving the slider bar back and forth; clicking on score sections or movements; using the back and forward arrows associated with the slider bar. The least used method was the back and forward arrows. Some difficulties were encountered when users did not intuit the function of the slider bar. For instance, for task B7, NON-3 and MUS-6 clicked the forward and back arrows to get to p. 64 of the score, rather than inputting the page number or using the slider. MUS-1 did not immediately see the slider bar either, commenting, "How do you scroll down? How do you scroll to the next page?"

Suggested additions to turning pages included the capability to enter a measure number and be able to jump to that (MUS-2,7), and having the score pages turn automatically as the music is playing (MUS-2,5).

Work Tab Visibility

As with the media player, users tended not to see the Work tab, or at least not click on it. Task B6 asked which page the Development section of the work started on. Correct completion of this task required that users click on the Work tab and then click on the Development link, which would immediately move the score to the start page associated with the development section. Users were observed playing the entire piece from the beginning and listening to try to "hear" the start of the development section (MUS-1,4). One clicked on the "View Work Detail" link with no luck (MUS-5). Others simply gave up after clicking around and zooming in and out, commenting, "I don't know how you find the development". During the debriefing, one user indicated that he would be distrustful of score sections being pre-marked: "I guess it's nice that everything's like sectioned off for you, in terms of like form and everything in the scores....but it's kind of weird....like, you still have to make sure and

find out for yourself...You feel weird having somebody do your work for you....So it's good and it's bad." Others felt that having the sections marked would be an advantage: "That's pretty cool that you can just jump to the page of a different movement." When asked how the Works tab could be improved or made more visible, four music major users suggested changing the word "Work" to "Form".

Resizing, Zoom & Blurriness

Those who disliked the score viewer tended to cite resizing issues as their main objections. MUS-1, for instance, felt the detail in the score was too small because she didn't resize from the default presentation. Similarly, MUS-7 felt, "It was kind of hard to see notes. Even when you'd zoom in...." Some users simply did not use the zoom capabilities. With the exception of MUS-5 who felt that the "scores are well done," and liked the detail of "zoom in and out," those who used Zoom felt the term "Zoom" was unclear and that perhaps a term related to "Size" or "View" might be better suited. One tried to resize using the Compact vs. Full View and expressed dissatisfaction with the difference between the two views. Two users (MUS-5,6) felt that the score blurriness was the biggest turn-off.

Bookmarking

The processes of adding, annotating and managing bookmarks presented many task difficulties for users. Although user satisfaction ratings reported that the process of bookmarking was fairly straightforward and an appealing feature, verbal comments indicated that many users thought that the bookmark feature was the hardest component to use and the feature they liked least. The lowest mean satisfaction score was associated with the question that asked whether "Making and using bookmarks in order to compare different types of musical formats and examples would be" frustrating or enjoyable. The mean score for music majors was 3.86, indicating a higher level of frustration with bookmarking than with any other process. The prospect of using bookmarks to do detailed listening was much more appealing to non-music majors (1.67) than music majors (3.14).

Opinions were mixed about the usefulness and appeal of bookmarking. Several users liked bookmarking the least and felt it was difficult to use. User MUS-4 felt that "The bookmarking gave me a lot of trouble," and said, "I probably wouldn't [use the bookmarking]." When asked why, the response was, "whenever we have listening exams I just go through the score and listen to the whole thing...because then you kinda know what's coming before and what's coming after...." MUS-5 felt that the bookmarking component was the hardest component to use and MUS-2 claimed that he wouldn't be likely to use them. MUS-7 also claimed that bookmarks were the most difficult component to use because it was "hard to pinpoint and add in the comments". A few liked the idea of bookmarking even though they had difficulty with the process. User MUS-1 commented during debriefing that "bookmarks and labeling" were what she liked best about V2 even though she had difficulty with task completion during the session. NON-1 also liked the bookmarking function and icon the best, among other functions.

Adding bookmarks

Most users added bookmarks using only the Bookmarks menu choice, "Add a bookmark" even though the "Add" button was in close proximity to the slider; no users selected the "Add" button when placing the first bookmark. User MUS-7 commented that she "wasn't sure that the "Add" button was for" and that she had "never really bookmarked before." Users were more likely to use the "Add" button once they had added a bookmark with the "Add a bookmark" menu choice and then

recognized the bookmark icon on the "Add" button. One unique issue with adding bookmarks occurred when user MUS-7 tried to add a bookmark by using the "Add a bookmark" menu choice. When she pulled down the menu, the spot she intended to bookmark was covered by the menu: "...kind of hard to add a bookmark because when I clicked on Add a bookmark the menu covered up the time."

A couple of users (NON-2, MUS-5) immediately selected the "Browse by Track" option in order to pinpoint the bookmark spot required in task C6. Others, though, initially had trouble adding a bookmark at a particular spot. MUS-4 eventually found the "Browse by" options and began placing bookmarks with the "Add" button while others just tried to get close to the right spot or put the bookmark in the wrong spot entirely and never changed the "Browse by" option. NON-3 immediately went to the help page to try to figure out how to add a bookmark at a certain spot.

Lack of Feedback

One major issue with the bookmarking process was the lack of visible feedback, particularly when users clicked the Update button. Participants were observed clicking on the "Update" button several times for one single change to see if there was any feedback that a change had been made, (e.g. to an annotation). Participant MUS-5 repeatedly added annotations and then tried clicking on the bookmark icons on the player slider bar to see if the annotation would appear as he clicked or hovered over it. During task C7, MUS-2 commented, "Did it update?" Similarly, during task C9, MUS-6 clicked on "Update" after adding an annotation but nothing visible occurred. The subsequent response was, "Whatever...Assume that is done." For the same task, NON-1 also commented, "Doesn't look like it's adding my comment or annotation."

The same type of problem occurred with task C12 in which participants had to move a bookmark into a folder. After choosing "Move to" and selecting the correct folder, MUS-1 said, "Not sure if I did that right," and MUS-6 said, "Did that work?" These comments appeared to result from the fact that the folder hierarchy does not automatically expand to show the new contents once the "Move to" window is closed. A similar non-expanded hierarchy incident occurred when MUS-6 added a bookmark using the "Add" button, but when he checked the bookmark in the Edit bookmarks window, he did not see it since the hierarchy was not expanded [and he did not click on the "+" symbol]. Consequently, he proceeded to switch between the player and Edit bookmarks windows several times while he inserted more and more bookmarks with the "Add" button to see if his bookmarks were really being updated.

Annotations

In addition to the lack of feedback when updating annotations, a few other annotation problem areas were present. For instance, the difference between the "Label" and "Annotation" fields in the Edit Bookmarks window was unclear for some. MUS-1 commented, "I'm looking for the place where you write down the comments...but I don't see it." User MUS-4 tried to place an annotation or comment in the label field, thereby deleting the default text of track and time. NON-3 attempted to make an annotation by clicking the "Properties" button. MUS-5 used help to try to figure out how to view an annotation after hovering over it with the mouse did not work.

Drag-n-Drop

Some users tried to drag-n-drop bookmarks and folders, a feature that is not available in the prototype. In particular, four users (MUS-1,4; NON-2; Pilot)

unsuccessfully tried to drag-n-drop bookmarks into a folder to complete task C12. MUS-3 tried to drag-and-drop in order to change the order of visible bookmarks for task C10.

Miscellaneous Bookmark & Folder Management Issues

User NON-3 tried to double click on a folder to open it and view the contents rather than expanding the hierarchy by clicking on the +. A second user attempted to use the "Move to" button to move bookmarks into a different order for task C10. User MUS-3 hit return instead of "Update" when attempting to add a new folder.

Additional Features

Several users advocated the addition of more right mouse click capability. MUS-2 wanted to right-click to see annotations while MUS-3 and NON-2 thought right-click to delete would be helpful.

A couple participants questioned that there was not a confirmation of delete message for bookmarks and folders. MUS-3 wondered, "Say I accidentally delete this. Is there a way to get it back? Sometimes it can save you...." NON-2 also wondered aloud about a delete confirmation when she completed task C13.

Help Page

Only six users visited the help page. Those who did gave it fairly high combined satisfaction marks for content (1.5) and navigation (1.83). The one user who had problems using the help page went to it in order to find out how to place a bookmark but then got distracted by trying to find directions for printing scores (a task from earlier in the test). This user scrolled up and down the page for a lengthy period before he actually saw the question and answer for the process of printing a score. This action contributed to this user having the longest overall task time. The other five users who went to the help page appeared to have no great difficulty getting to the relevant content for the task (i.e. how to print a score).

V. Recommendations

Recommended V2 design changes are listed in Table 5 and organized by system components. Each recommendation is assigned a severity rating that should determine the priority given to fixing the issue. Severity ratings are as follows:

High – Issue prevents users from making progress or led to severe mistakes.

Medium – Issue causes confusion, annoyance, or minor mistakes.

Low – Issue causes minor amounts of confusion, inefficiency, or dissatisfaction.

Bug – System was not working properly.

Table 5 – Issues, Recommendations, and Severity Ratings

Issue	Recommendations(s)	Severity Rating
Searching for Selections		
There are too many pathways to get to content, rendering it difficult for users to get a good mental model of the proper step sequence.	<ul style="list-style-type: none"> Eliminate the "Select" links. Have links for the Work and Composer as the only selection choices for any search result item. 	High
Link dropdown menus hinder users who want to move through the selection process quickly.	<ul style="list-style-type: none"> Eliminate dropdown menus completely. Assign right-click capability to links and include dropdown choices there keeping in mind that right-click will be an issue for Mac users. Eliminate the "Continue Current Query" choice; this is redundant. 	High
Search results message does not clearly indicate the format of results.	<ul style="list-style-type: none"> Format results list so that recordings results are easily distinguishable from scores results, e.g. "1 recording and 2 scores were found." 	High
It is difficult to quickly distinguish between the choices on the search results link dropdown menus.	<ul style="list-style-type: none"> Shorten the text on the dropdown choices and put more relevant words closer to the beginning of the sentence. 	Medium
Users tend to not read the search results message and instead go right to clicking links.	<ul style="list-style-type: none"> Display search results message in a non-moving area (e.g. frame) at the top of the screen. 	Medium
"No search results found" message does not offer suggestions for improving the search.	<ul style="list-style-type: none"> Include a hint that users may want to try broadening their search by filling in fewer fields or selecting "All recordings". 	Medium

Users may have to scroll a long distance for results lists.	<ul style="list-style-type: none"> • Divide results into manageable amounts on pages that may be accessed with a back and forth button. 	Medium
It is difficult to quickly distinguish <i>recordings</i> search results from <i>scores</i> .	<ul style="list-style-type: none"> • Eliminate the "Listen" and "View" buttons. If this is not possible then change score text to "View Score". • Add icons that indicate whether a result is for listening or viewing (e.g. a note or score page). • Present a background display that differentiates recordings from scores. • Divide the scores section from the recordings section with a horizontal line. • Use a different text color for score information/links. 	Medium
It is cumbersome to switch back and forth between search results categories.	<ul style="list-style-type: none"> • Provide anchor links to recordings vs. scores sections (perhaps with icons). • Add a button that allows one to temporarily "hide" the recordings or scores (if both are retrieved) so that quickly browsing one or the other category is possible. 	Medium
Additional composer information is difficult to retrieve.	<ul style="list-style-type: none"> • Eliminate the dropdown and make it a link that opens a pop-up window to composer information. • Place the "View more information about this composer" link to the right of the composer name. 	Low
Currently allowed search formats are prohibitive.	<ul style="list-style-type: none"> • Allow IUCAT syntax to be used for conducting search queries. • Enable Boolean queries 	Low
Back and Forward buttons alone do not clearly indicate their function.	<ul style="list-style-type: none"> • Add a left-facing arrow to the left of the Back button and a right-facing arrow to the right of the Forward button. 	Low
Users had to move up and down through search results using the vertical scroll bar.	<ul style="list-style-type: none"> • Enable scrolling with the mouse wheel button. 	Low
It is difficult to read the search results text.	<ul style="list-style-type: none"> • Eliminate italic font in lieu of a regular sans serif such as Arial or Verdana. 	Low

Playing Selections		
Misinterpretation of the meaning of "Work" on the Work tab caused users to avoid clicking on it.	<ul style="list-style-type: none"> Change Work tab label to "Form". 	High
Users frequently did not notice the "Browse by" dropdown box options.	<ul style="list-style-type: none"> Present the dropdown options as three radio buttons that are constantly visible. Users could change the "Browse by" presentation by simply clicking on the button or the text. 	High
When users click on track indicator arrows on slider bar, the slider does not move to that specific track or point.	<ul style="list-style-type: none"> Align slider arrows with tracks. 	Medium
Users had difficulty associating tracks with their lengths.	<ul style="list-style-type: none"> Show track times next to track titles. Display track times options (Total, CD/Side, Track) with tabs or radio buttons. 	Medium
The slider can only be moved with the mouse.	<ul style="list-style-type: none"> Allow the slider to be manipulated with the keyboard 	Low
The Show/Hide Work button really shows and hides the recording structure items.	<ul style="list-style-type: none"> Change button text to "Show/Hide Recording(s)" 	Low
Users may not realize that there is a difference between "Listen" and "View" search results and may try to access a score through the player.	<ul style="list-style-type: none"> Include link(s) to available score(s) for a recording from within the player window. 	Low
Media player default is to start playing the first track on the recording.	<ul style="list-style-type: none"> Format player so that it plays the selected recording link no matter which track it is. 	Bug
Viewing Scores		
Initial score display does not enable users to quickly jump to different movements.	<ul style="list-style-type: none"> Under the Symphony link, have an initially expanded dropdown list of movements. Move the movements links from the Work tab to the Score tab or delete the Work tab entirely. Make the Works tab the default presentation instead of the Score tab. 	High
Misinterpretation of the meaning of "Work" on the Work tab caused users to avoid clicking on it.	<ul style="list-style-type: none"> Change Work tab label to "Form". 	High
User tried to scroll up and down to turn pages.	<ul style="list-style-type: none"> Add "Turn pages" text over/around the slider bar. 	Medium
"Zoom" does not convey resizing actions.	<ul style="list-style-type: none"> Change "Zoom" text to "Size" or "View". 	Medium

Users were unhappy with the initial score presentation.	<ul style="list-style-type: none"> • Make default score presentation the 'Fit-Width' or 'Fit to Window' view with height maximized to fit screen display. • Have score open to the first page rather than the Title page. 	Medium
Score resolution was blurry.	<ul style="list-style-type: none"> • Test scores on screens with different resolutions to see what the best combination is. 	Low
Users were distrustful of having the score sections other than movements (e.g. development, exposition) already marked.	<ul style="list-style-type: none"> • Provide a link to an authoritative source from whence sections were determined. 	Low
Slider bar arrows for turning pages were not always noticed so that users tried to pinpoint or move back and forth one page at a time with the slider bar.	<ul style="list-style-type: none"> • Add labels under the arrows on the slider bar that say "back" and "forward" or "previous" and "next". • Highlight arrows with a drop-shadowed box so that they appear more clickable (i.e. look like buttons). 	Low
Bookmarking		
There is no visible feedback when "Update" button is pressed to add an annotation.	<ul style="list-style-type: none"> • Have an "A" appear to the left of the bookmark when an annotation is added. Mousing over the "A" would cause the annotation to pop-up in a text box. As well, clicking on the "A" would cause the annotation to expand to the right of the bookmark label. • Upon clicking "Update" have annotation immediately appear to the right of the bookmark label in the main window. 	High
Bookmarks may be deleted with no warning.	<ul style="list-style-type: none"> • Add a "confirm delete" message when "Delete" button is clicked in Edit bookmarks window. • Add a "confirm delete" message when "Clear" button is pressed in player window or score viewer. • Add an "Undo" button that works for at least one level of undo. 	High
Bookmarks added with "Add" button on player or score viewer window are not immediately visible when the "Edit	<ul style="list-style-type: none"> • Have newest bookmark highlighted with hierarchy section automatically 	High

bookmarks" window is subsequently opened to add an annotation or otherwise edit that bookmark.	expanded, and cursor in Annotation field when "Edit bookmarks" window is opened.	
In both the player and score viewer windows, the Bookmarks menu, when dropped, may cover part of the slider bar and time display, rendering it difficult to exactly place bookmarks.	<ul style="list-style-type: none"> • Enclose the "Clear" and "Add" bookmarks buttons in a box that is labeled "Bookmarks" and move it to below the slider bar. • Eliminate the ability to add a bookmark using the menu. • Move the timing and Browse by options to below the slider. • Move player to the bottom of the window and track information to the top. 	High
There is no visible feedback after a bookmark or folder has been moved to a new location.	<ul style="list-style-type: none"> • When "Move to" window is closed have hierarchy automatically expand to show new location of bookmark or folder. 	Medium
Users have limited methods for managing, moving, deleting, and viewing bookmarks.	<ul style="list-style-type: none"> • Add drag-n-drop capability for moving bookmarks and folders. • Allow double-clicking to open bookmark folders. • Make hitting "Return" or "Enter" on keyboard a shortcut for clicking on "Update". • Allow "Delete" keyboard shortcut. 	Medium
Intended meaning of "Annotation" vs. "Label" is hard to distinguish.	<ul style="list-style-type: none"> • Change "Annotation" to "Comment" 	Low
Help Page		
One user found it difficult to distinguish the question from the answer in the section about Viewing and Printing Scores.	<ul style="list-style-type: none"> • Use a different color font to distinguish questions from answers. 	Low
Some help content that users searched for was not present.	<p>Add or expand on the following help topics:</p> <ul style="list-style-type: none"> • How do I add annotations? • How do I turn pages? 	Low

VI. Discussion

Overall

One of the biggest issues with the test occurred because we included non-music major user group. The members of this group did not have extensive musical backgrounds. Therefore, some difficulty with task completion may have been due to misinterpretation caused by unfamiliarity with musical terminology used throughout the tasks (e.g. score, movement, symphony).

Searching for Selections

Once users were familiar with the procedure of narrowing down results lists, they were able to get to the information they wanted quickly. Some of the functionality of the search interfaces had not yet been enabled (i.e. Back and Forth buttons) so that may have impeded progress.

Playing Selections

Many users commented that they enjoyed the how quickly the player window opened and began playing their selections. However, in the testing condition, all music files were local to the test machine. When users interact with V2 in a real context, there likely will be minimal delays in retrieving materials for playback.

Viewing Scores

It is doubtful that the blurriness of scores can be resolved as it relies on the resolution of the computer being used and the digitization process. In addition, some scores are blurry in the originals as they may be old copies or printed badly.

Bookmarking

Bookmarking will presumably be more favorable once the minor functionality problems are fixed. It is anticipated that students will be more likely to use bookmarks if bookmarks are integrated into class activities.

Help System

Only one task "forced" users to visit the help page and only six users actually visited the help page. The help page should not be significantly redone until a more specific study ascertains the usefulness of the content and possible navigational issues.

Future Studies

Issues which this study did not address and/or ideas for future studies include the following:

- Test Variations2 on a Macintosh system to investigate usage and aesthetic issues.
- Generate different looks for the interfaces and test which ones are more visually appealing.
- Conduct a specific study geared toward the help system content.
- More content should be added for more robust searching capabilities in future tests.
- Faculty who plan to require students to access class reserve lists through V2 should provide students with an introduction to Variations2. Perhaps a web-based instructional document/tutorial should be created for this purpose.

VII. Appendices

Demographic Questionnaire

1. Are you Male / Female? (Circle one)

2. What is your major?

3. What is your age? _____

4. How many hours per week do you spend using a computer?

- _____ 0-5
- _____ 6-10
- _____ 11-20
- _____ 20 or more

5. Rate your computer experience on the following systems by circling 1-5 below:

a. PC: Novice 1 2 3 4 5 Expert

b. Macintosh: Novice 1 2 3 4 5 Expert

6. Approximately how often do you use Variations?

- _____ I have never used Variations*
- _____ once a month or less
- _____ once every two weeks
- _____ once a week
- _____ 1-5 times a week
- _____ more than 5 times a week

***If your answer to question 6 was, "I have never used Variations" then you may proceed directly to the Scenario portion of this session. Otherwise, answer questions 7 and 8 before continuing.**

7. What activities do you mainly use Variations for? (e.g. listening to a class reserve list, recital preparation, personal listening, etc.)

8. Where do you go to use Variations?

Satisfaction Survey

Circle a number from 1 – 7 on the continuum that best represents your experience with the Variations2 system.

1. Please rate your overall reaction to using the Variations2 system:
Satisfying 1 2 3 4 5 6 7 Disappointing
2. Using the media player controls to select different *movements* of a work was:
Easy 1 2 3 4 5 6 7 Difficult N/A
3. Using the media player controls to select specific *tracks* to play was:
Simple 1 2 3 4 5 6 7 Hard N/A
4. Getting to the pages in a score that I wanted to view was:
Straightforward 1 2 3 4 5 6 7 Tricky
5. I would use the score viewer to examine the details of a piece's orchestration:
Always 1 2 3 4 5 6 7 Never
6. The process of bookmarking spots in my listening selections was:
Straightforward 1 2 3 4 5 6 7 Confusing
7. Making and using bookmarks in order to compare different types of musical formats and examples would be:
Enjoyable 1 2 3 4 5 6 7 Frustrating
8. The prospect of using bookmarks to do detailed listening is:
Appealing 1 2 3 4 5 6 7 Unappealing
9. Entering search terms produced results that I expected:
Always 1 2 3 4 5 6 7 Never
10. The format of the search results list was:
Self-explanatory 1 2 3 4 5 6 7 Unclear
11. Finding additional information about composers was:
Trouble-free 1 2 3 4 5 6 7 Difficult
12. Clicking on links in my search results list led to outcomes that were :
Expected 1 2 3 4 5 6 7 Surprising
13. Switching between screens (search window, media player, score viewer) was:
Simple 1 2 3 4 5 6 7 Tedious
14. I found the help page content:
Appropriate 1 2 3 4 5 6 7 Inadequate N/A
15. Navigating the help page content was:

Easy 1 2 3 4 5 6 7 Difficult N/A

16. Once Variations2 is implemented, how likely would you be to use the system for *online listening*?

Likely 1 2 3 4 5 6 7 Unlikely

17. Once Variations2 is implemented, how likely would you be to use the system to *view online scores*?

Likely 1 2 3 4 5 6 7 Unlikely

Debriefing Questions

1. Did the Scenario presented to you seem realistic?
2. What components of the Variations2 system did you find easiest to use?
3. What components of the Variations2 system did you find hardest to use?
4. Are there any functions that you would add to the Variations2 system?
5. What did you like best about Variations2?
6. What did you like least about Variations2?
7. Comment on the media player.
8. Comment on the score viewer.
9. Comment on the search interface.
10. Regarding initial search screen, what did you expect to be able to do here?

Scenario

You have a quiz next week in your music history class and decide to use Variations2 to prepare. The listening reserve list for the quiz includes the following composers and pieces.

Using Variations2, search for the reserve list pieces below and answer the questions or complete the instructions pertaining to each selection. Read through all the tasks for each listening selection before beginning a search.

Listening Reserve List

A.) Copland, Aaron - *Music for the theatre*

1. How many Copland works are available in the Variations2 system?
2. How many recordings of the piece *Music for the theatre* are available for listening?
3. What Track contains movement II of *Music for the theatre*, entitled Dance: Allegro Molto?
4. Start listening to movement II of *Music for the theatre*.
5. Adjust the volume if necessary.
--As you are listening, a friend walks up to chat—
6. Interrupt playback for a moment to talk to your friend.
7. Start playback exactly where you left off.
8. How long (minutes:seconds) is the section entitled *Burlesque: Allegro Vivo*?

B.) Beethoven, Ludwig van – *Symphony No. 7 in A Major, Op. 92*

1. How many Beethoven symphonies are available in the Variations2 system?
2. How many scores for *Symphony No. 7 in A Major, Op. 92* are available for viewing?
3. How many variant names for Beethoven exist?
4. How many movements does *Symphony No. 7 in A Major, Op. 92* have?
5. View a score for *Symphony No. 7 in A Major, Op. 92*.
6. On which page of the score does the *Development* section of *Movement I* begin?
7. What is the name of the movement that contains p. 64 of the score?
8. Print out p. 64 of the score.

[Continue to Page 2]

C.) Bach, Johann S. – *Sonata No. 1 in B minor for violin and harpsichord (BWV 1014)*

1. Start playing the sound recording published by Virgin Classics that contains *Sonata No. 1 in B minor*.
2. What is the TOTAL play time for this sound recording (including both CDs)?
3. Start listening to *Sonata No. 1 in B minor*.
4. How long (minutes:seconds) is the CD which contains *Sonata No. 1 in B minor*?
5. Start listening to movement IV, *Allegro*.
6. In movement IV, *Allegro*, add a bookmark at 2:31.
7. Add the comment, “Lovely use of harpsichord” to the bookmark.
8. In movement IV, *Allegro*, add a second bookmark at 0:25.
9. Add the comment, “Strings have melody” to the bookmark.
10. Change the order of your bookmark list so that the bookmark at 0:25 comes *before* the bookmark at 2:31.
11. Make a new bookmark folder and label it with your name.
12. Put the bookmark you made at 2:31 into the new folder.
13. Delete the bookmark you made at 0:25.

Scenario

A friend has asked you to accompany her to an orchestra concert. Before you say yes, you decide to listen to the program pieces to make sure you will enjoy the concert. After getting a list of the concert pieces, you arrive at the music library to listen to them online.

Using Variations2, search for each concert program piece below and answer the questions or complete the instructions pertaining to each selection. Read through all the tasks for each listening selection before beginning a search.

Concert Program

A.) Copland, Aaron - *Music for the theatre*

1. How many Copland works are available in the Variations2 system?
2. How many recordings of the piece *Music for the theatre* are available for listening?
3. What Track contains movement II of *Music for the theatre*, entitled Dance: Allegro Molto?
4. Start listening to movement II of *Music for the theatre*.
5. Adjust the volume if necessary.
--As you are listening, a friend walks up to chat—
6. Interrupt playback for a moment to talk to your friend.
7. Start playback exactly where you left off.
8. How long (minutes:seconds) is the section entitled *Burlesque: Allegro Vivo*?

B.) Beethoven, Ludwig van – *Symphony No. 7 in A Major, Op. 92*

1. How many Beethoven symphonies are available in the Variations2 system?
2. How many scores for *Symphony No. 7 in A Major, Op. 92* are available for viewing?
3. How many variant names for Beethoven exist?
4. How many movements does *Symphony No. 7 in A Major, Op. 92* have?
5. View a score for *Symphony No. 7 in A Major, Op. 92*.
6. On which page of the score does the *Development* section of *Movement I* begin?
7. What is the name of the movement that contains p. 64 of the score?
8. Print out p. 64 of the score.

[Continue to Page 2]

C.) Bach, Johann S. – *Sonata No. 1 in B minor for violin and harpsichord (BWV 1014)*

1. Start playing the sound recording published by Virgin Classics that contains *Sonata No. 1 in B minor*.
2. What is the TOTAL play time for this sound recording (including both CDs)?
3. Start listening to *Sonata No. 1 in B minor*.
4. How long (minutes:seconds) is the CD which contains *Sonata No. 1 in B minor*?
5. Start listening to movement IV, *Allegro*.
6. In movement IV, *Allegro*, add a bookmark at 2:31.
7. Add the comment, “Lovely use of harpsichord” to the bookmark.
8. In movement IV, *Allegro*, add a second bookmark at 0:25.
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10. Change the order of your bookmark list so that the bookmark at 0:25 comes *before* the bookmark at 2:31.
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