

## CS 4063/5063

### Homework: Design C

Due Tuesday 2022.03.01 at 11:00pm.

*All homework assignments are individual efforts, and must be completed entirely on your own.*

In this homework you will: (1) gain experience using new wireframe elements; (2) create a wireframe based on a UI specification that includes a reference sketch; (3) storyboard an interaction sequence for a typical task in the UI; (4) do a Hick's Law analysis of menu selection in the UI for a common menu choice; (5) do a Fitts' Law analysis of the layout.

### **Reminder: References for Using Wireframes**

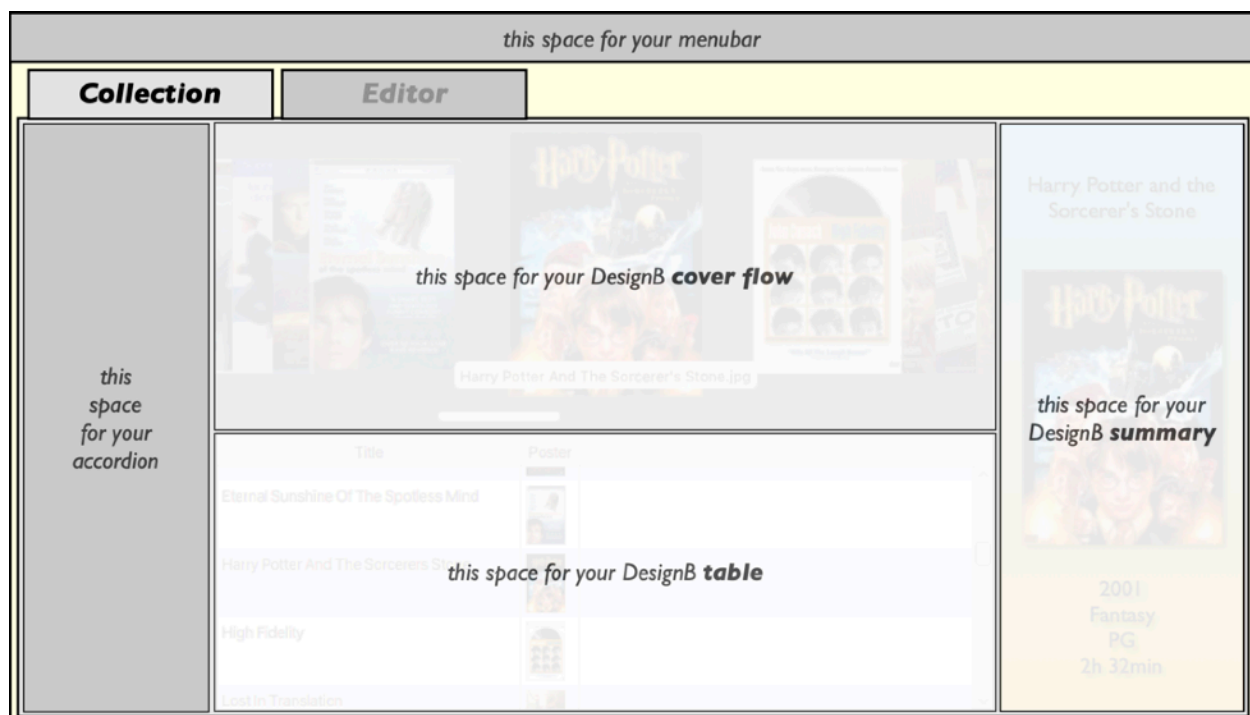
user guide: <https://balsamiq.com/wireframes/desktop/docs/>

tutorials: <https://balsamiq.com/tutorials/>

intro to wireframing: <https://balsamiq.com/learn/courses/wireframing/>

### **The Design Scenario**

Imagine you are a designer on a large team. The team is developing a new application in JavaFX for browsing a personal movie collection on a desktop or laptop. The team is currently exploring how to integrate file loading and interactive filtering features into the application. After some discovery research to identify user wants and needs, the team provided you with a specification of menu options, filtering features, and limitations on which widgets you may use in your design. Your job is to add a menubar and a filtering accordion to an existing design that includes tabs for Collection and Editor panes. You will use Wireframes to design the layout, storyboard a browsing scenario to present to the team, and add Comments with analysis of your design choices for discussion.



### **The Design Specification**

*“The application window will show a menubar above the previously designed Collection and Editor tabs. The menubar will contain four menus: a **Movies** menu with About and Quit options; a **File** menu with New, Open, Close, Save, and Print options; an **Edit** menu with Undo, Redo, Cut, Copy, and Paste options; and a **Window** menu with a list of 7 currently opened collection files. Files will be displayed as filenames in the list, with the file loaded in THIS window shown as selected somehow. The Print, Undo, and Redo options will be shown as disabled. Each menu will include appropriate separators to visually group its options into related sets of functions. All options in the **Movies**, **File**, and **Edit** menus will have familiar keyboard shortcuts, using CNTL as the modifier key.*

*The Collection Pane will display filtering features in an area to the left of the previously designed **cover flow**, **table**, and **summary** areas, laid out as shown in the figure above. The new area will consist of an **accordion** with a separate titled section for each of four attributes: title, genre, rating, and any other attribute shown in the table except image. Each section of the accordion will display only common, appropriate UI elements. Users can enter values in the elements to dynamically filter the movies in the **table**. The **table** will be filtered to show only the movies that pass all four of the following filtering criteria:*

Section/Attribute	UI Element	Entered Value(s) for Filtering	Movie Filtering Criterion
title	text field	a string	its title contains the string
genre	list	a subset of the available genres	one of its genres is selected
rating	<i>your choice</i>	one of the available ratings	its rating is selected
<i>other</i>	<i>your choice</i>	<i>your choice (can be multiple)</i>	<i>its attribute value matches</i>

### **Augment The Previous Design**

In Wireframes, create a new project called **DesignC**. Copy over your **Collection & Editor** wireframes from **DesignB**. (You may modify them or create new ones from scratch if you want or need to.) Don't forget to copy over any assets used in the wireframes. In both wireframes, put the tabs inside a **Window** element then add a **Menu Bar** element to match the layout in the sketch above. Feel free to adjust the size and/or aspect ratio of the **Window** elements and their contents to make your design fit.

To make storyboarding easier, prepare some reusable parts to copy and paste. Create a third wireframe called **Parts**. Add a **Menu** element for each of the four menus described above, and fill them with your menu designs. For each of the four filtering attributes, add an **Accordion** element that displays your filtering UI when that attribute's section of the accordion is open. Copy the one that shows the *title* section open and paste it in into the space reserved for the accordion in your **Collection** wireframe.

### **Storyboard a Common Task**

Faceted filtering is an increasingly common way to drill down into large data collections when performing a wide variety of tasks. Imagine a scenario in which a user adds notes for a movie using the following sequence of interactions: (1) select the **File** menu in the

menubar; (2) select the Open option; (3) select Genre in the **accordion**; (4) select the Comedy genre; (5) also select the Fantasy genre; (6) select Rating in the **accordion**; (7) select the PG rating; (8) select the third movie in the table (“Shrek 2”); (9) select the Editor tab; (10) select the comment text area; (11) type to extend the comment; (12) select the **File** menu in the menubar; (13) select the Save option. (Note: Assume that the file being opened and saved is predetermined, so that no file choosing is involved.)

Create a fourth wireframe called **Task Flow**. In the wireframe, layout a box-and-arrow diagram like in **DesignB**, but only include paths for the four most straightforward ways that a user might complete filtering steps 3–7 in different orders (without looping).

Next, create a storyboard of the task flow. For each box, create a duplicate wireframe of either your **Collection** or **Editor** wireframe—whichever is appropriate for that interface state. Rename the duplicate to match the corresponding box label, then alter it to show what the UI would look like just before the user performs the corresponding step. Copy menu and/or accordion parts from your **Parts** wireframe to make this faster and easier! Markup elements as appropriate to help fellow designers understand what’s going on.

Finally, link your wireframes (<https://balsamiq.com/wireframes/desktop/docs/linking/>) to let people see the storyboard in action. Link each box in the diagram to its wireframe. In each wireframe, link the element acted upon to the next wireframe in the task flow. (For elements that don’t support the “Links” option, you can add a *Link* element on/near the element.) In each wireframe, also add buttons outside of the main layout to go back to any previous wireframes in the task flow, plus one called “Home” to jump to the **Task Flow** wireframe. Use Full Screen Presentation mode to test navigate your storyboard.

### **Analyze the Design**

Use Hick's Law to calculate the expected time for a user to choose the Open option in the **File** menu. Identify a reasonable way to modify the design of your menus to improve the expected time. Add a **Comment** element to your **Collection** wireframe that: (1) describes how you determined the number of levels to use and the value of *n* for each level, (2) shows your work for each major step of the calculation, (3) describes your proposed menu modification, and (4) briefly analyzes the modification in terms of benefits and drawbacks to the user.

Use Fitts' Law to calculate the expected time for a user to complete the task along one of the paths in your storyboard. (See the “Fitts' Law of ClassNav” slide if you need help.) Include clicks in the menubar/menus/menu items. For steps 2 and 13, add your Hick's Law result to account for time spent choosing. For step 11, add 5 seconds to account for time spent typing a short sentence. Identify the slowest step in steps 3–8. Identify a reasonable way to adjust the layout of the **accordion** and/or **table** areas to significantly improve the expected task time. Add a **Comment** element to your **Collection** wireframe that: (1) describes how you determined the number of movement time values to calculate and the values of *A* and *W* that you used for each one, (2) shows your work for each major step of the calculation, (3) describes your proposed layout modification, and (4) briefly analyzes the modification in terms of benefits and drawbacks to the user.

### **Turning It In**

Use the **Project/Save Project As...** menu item to save a copy of your project. The exact name of your file should be simply **DesignC.bmpr**. Make sure it contains all and only the wireframes, assets, links, markup, and comments that you wish to submit. Submit the file to the **Homework - Design C** assignment in Canvas.

To score the assignment, we'll be looking at: the completeness and quality of your augmented design; the appropriateness of your element choices for menus and the accordion relative to the specification; the general correctness of your Hick's Law and Fitts' Law calculations (including good choices of formula inputs); and how cogent, objective, and helpful your **Comment** elements are. The maximum score is 20 out of 20.