CSCI 201L Midterm – Programming
Fall 2014
13.0% of course grade

For this program, you will implement a GUI that displays one of two different looks based on input from the user. Please name your project `USCUsername_CSCI201_Midterm`. For example, if your username was ttrojan, your project would be named `ttrojan_CSCI201_Midterm`. Read through the entire exam before beginning so you understand what is required.

Begin by prompting the user for whether they want to run the image editor or the telephone application on the command line as follows.

```
Image Editor [image]
Telephone [phone]
What application would you like to run?
```

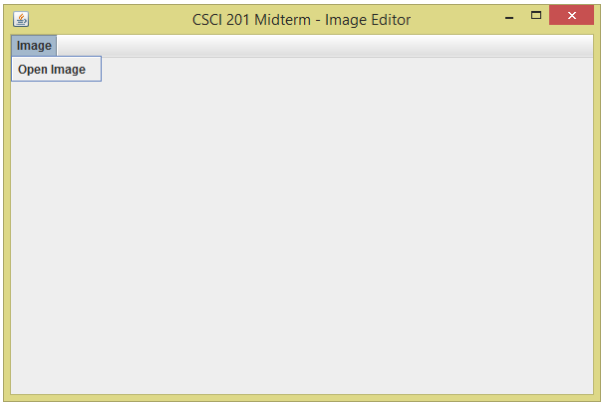
If the user enters anything other than image or phone, give an error message that says "Please enter a valid selection." Display the menu again. Continue this until the user enters `image` or `phone`, as follows. User input is shown in bold (though your program does not have to do this).

```
Image Editor [image]
Telephone [phone]
What application would you like to run? blah
Please enter a valid selection.

Image Editor [image]
Telephone [phone]
What application would you like to run? img
Please enter a valid selection.

Image Editor [image]
Telephone [phone]
What application would you like to run? image
```

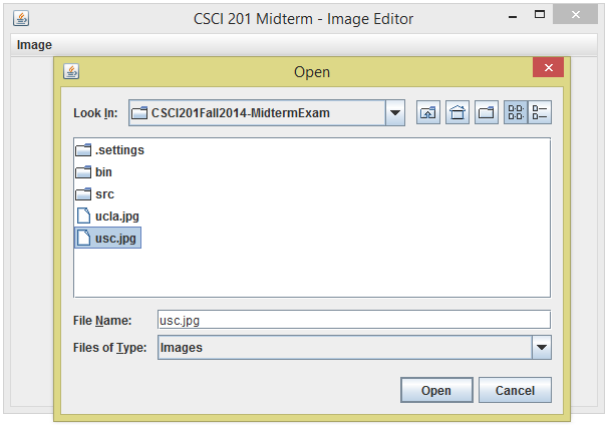
Image Editor

If the user types `image`, you will display the following GUI.

On the Image menu, there is one menu item called Open Image.



The Open Image menu item will display a file dialog box.



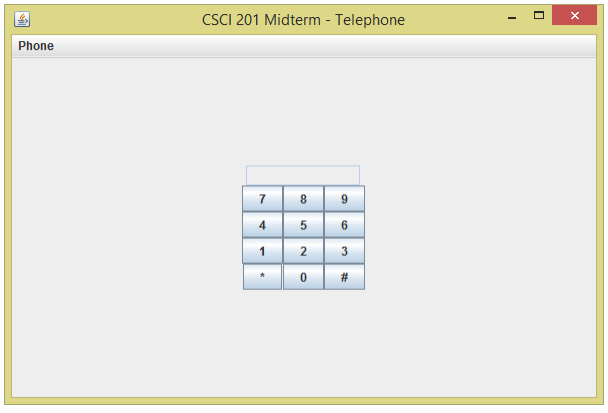
You will need to create a FileFilter that only allows .jpg, .png, .gif, and directories files to be displayed. Name the FileFilter `Images`., which will then be displayed in the "File of Type" box on the dialog box.

Once the user selects one of the image files, you will display it in the top center of your GUI.

The user could select another image, and that will replace the previous one. When the user clicks the "X" in the GUI, the application will close.

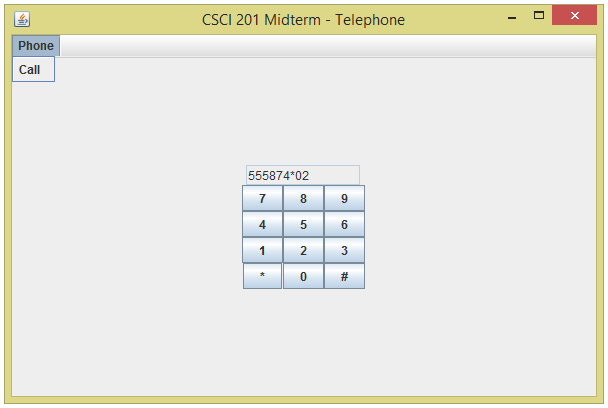
Telephone

If the user types `phone`, you will display the following GUI.



When the user clicks any of the buttons, the text field will be appended with the character. The text field should not allow the user to type into it.

On the Phone menu, there is one menu item named Call.



When the user clicks this menu item, you will initiate a text message to be sent to the number in the text field…just kidding. You will clear the text field when the Call menu item is clicked.

When the "X" is clicked, the application will exit.

Polymorphism

To ensure that you are using good object-oriented programming, you are provided with the `ParentGUI` class. This class will be the parent class of your image editor and telephone classes. You are not allowed to modify this class at all. Note that there are two abstract methods. In the `ParentGUI` constructor, there is only a call to `createGUI()`. That means that you will need to call `createMenuBar()` yourself in the child class. Here is the `ParentGUI` class.

```
abstract class ParentGUI extends JFrame {
	public ParentGUI(String title) {
		super(title);
		setSize(600, 400);
		setLocation(100, 100);
		setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
		JPanel jp = createGUI();
		add(jp, BorderLayout.CENTER);
	}
	protected abstract void createMenuBar();
	protected abstract JPanel createGUI();
}
```

You also must utilize polymorphism to display the GUI. This mean that you need to create a variable with a compile-time type of an abstract class and a run-time type of a concrete class, then call a method on that variable.

Grading Criteria

% of Final Grade	Criteria
3.5%	**Prompting and Polymorphism**
1.0%	Prompting the user for the type of application correctly
1.0%	Prompting the user repeatedly for the type of application as long as not typing “image” or “phone”
0.5%	Including ParentGUI unmodified
1.0%	Using polymorphism by creating a variable of the ParentGUI class but instantiating it as a concrete child class
5.0%	**Image Editor GUI**
0.3%	Creating Image Editor class that inherits from ParentGUI
0.5%	Displaying Image Editor GUI initially as shown
0.5%	Creating Image menu with Open Image menu item
1.0%	Displaying file dialog box when Open Image menu item is clicked
1.0%	Creating an image FileFilter as specified
1.0%	Displaying the image in the top center of the frame
0.5%	Replacing the previous image if another one is selected
0.2%	Exiting the program when the X is clicked
4.5%	**Telephone GUI**
0.3%	Creating Telephone class that inherits from ParentGUI
1.0%	Displaying Telephone GUI initially as shown
0.5%	Not allowing user to edit the text field
1.0%	Button actions appending character to text field
0.5%	Creating Phone menu with Call menu item
1.0%	Clearing the text field when Call menu item is clicked
0.2%	Exiting the program when the X is clicked