

Program Assignment 8

(25 points)

Due: Thursday, November 29, 2018

Purpose

This assignment to practice more on event model with a GUI, particularly handling different types of events with a single handler.

Graphic User Interface (GUI) of Rolling Dice

Design and implement a GUI game of rolling dice in Java. Use Java `awt` and `swing` for your implementation, rather than automatically generated code using Windowbuilder.

When a user plays the game, (s)he has a choice of selecting how many dice (max 4), roll the dice by clicking on a button, and find how many times (frequencies) each of the dice values occurred.

The GUI frame should have a `JTextField` for the display of the total value of the dice, a list of `JLabels` for showing the dice, two `JButtons` ("Show Freq", "Roll") for the user to act, and a `Choice` to select the number of dice.

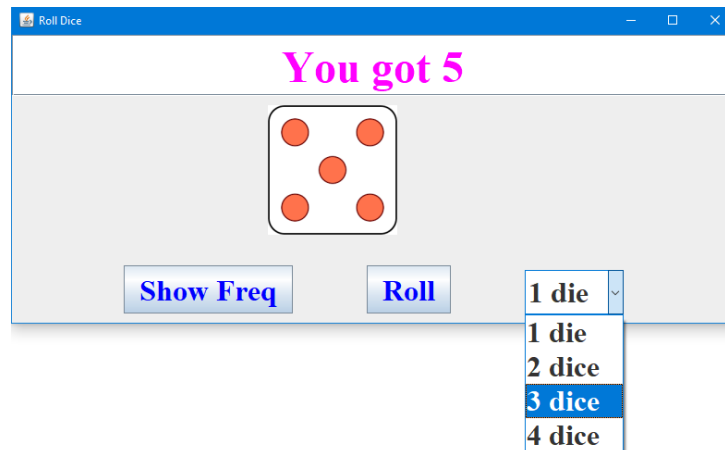
When your program starts, the GUI may look like this:



After the "Roll" button is clicked, an image of a die is shown on a label, and the value of the die is display in the text files:



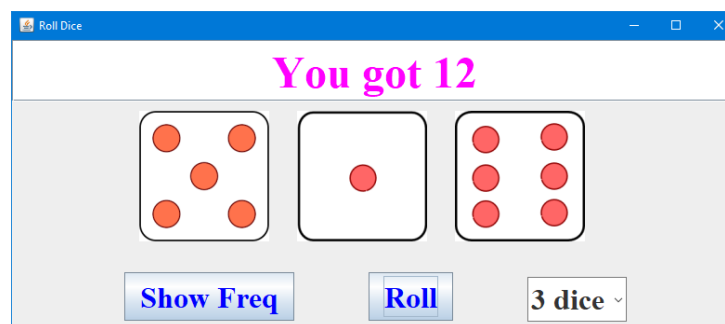
You can select the number of dice from the `Choice` component as shown here:



When the number of dice is selected, the GUI should be similar to the initial frame:



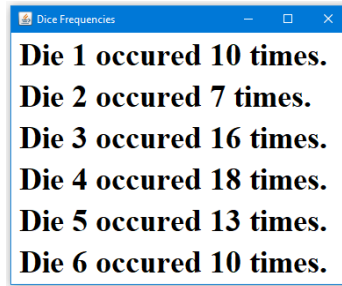
Then, clicking on "Roll", the selected number of dice images are displayed on the JLabels, and the total value of the dice is displayed in the text field:



You can selected different number of dice, and get something like this:



Keep rolling the dice multiple times (may be with different number of dice), and then click on the "Show Freq" button, the frequencies of each of the dice is displayed on another frame:



Requirements

Five classes are required:

1. **Die**. A die has a face value and an image that is an `ImageIcon`.
2. **GameFrame**. A `JFrame` for the GUI, similar to the figures on previous pages.
3. **StatFrame**. A `JFrame` containing a `JTextArea` for display of the statistics (frequencies), as shown above.
4. **Handler**. An event handler that handles events of button-click and choice-item-selection. The main tasks are:
 - (a) Constructor: get references to the components of the `GameFrame`, register the buttons and choice with this handler, initialize the values and images into a `Dice` array.
 - (b) Roll button: Assume the number of dice selected in n (default is 1). Generate n random numbers in the range of 1–6 for the face values of the n dice, display the images of the dice and the total of their values.
 - (c) Choice: When selected item changed, set the number of dice to the selected value. Null the `JLabels`.
 - (d) Show Freq button: Display a message about the frequencies of the dice rolled in the `StatFrame`, make it visible.
5. An application (with `main`) to create a `GameFrame` object, a `StatFrame` object, and a `Handler` object with the two frames as parameters. Make the `GameFrame` visible.

What to Submit

Submit your well-documented source program (`.java` files) on Blackboard.