

Final Term Assignments

Assignment Submission Instructions:

1. Put all the .java files of a particular assignment in a folder and **rename the folder** as follows: **XX-XXXXX-X_FT_Y**, for example: if your id is 12-21219-2 and you have done assignment 3 then, your folder name **MUST** be 12-21219-2_FT_3.
2. Zip the folder.
3. Upload the assignment.
4. Multiple Assignment Submission **MUST** be made in different folder.

1. Package Assignment (As stated in Previous File)

2. File Read Write Assignment (As stated in Previous File)

3. Fool Game (As stated in Previous File)

4. Click Counter Game (As stated in Previous File)

5. TicTacToe Game – Double Player

A sample of this game is available in this link: goo.gl/3LfVTH
It is a two player game.

6. TicTacToe Game – Single Player

A sample of this game is available in this link: goo.gl/3LfVTH
It is a single player game. Scenario is like that one has to play with computer. There is no need to implement any AI for computer's move, just use Random Number to generate computer's move.

7. Calculator

Version 1 (Inside of Assignment):

- Design a simple calculator with **10 numeric buttons** (from 0 to 9), **1 point button** (for decimal point), **5 operator buttons** (+, -, *, /, =), **1 backspace button** and **1 ClearAll button**.
- You may use any one of **JLabel, JTextField or JTextArea** for making the calculator screen. If you use JTextField or JTextArea, make sure they are not editable.
- The calculator should perform the basic arithmetic operations (addition, subtraction, multiplication and division).
- **Hint 1:**
 - i. Initially the display screen shows either **nothing** or a **zero**
 - ii. Whenever a numeric button is clicked, value of that button is showed on the screen.
Example: if **6** is clicked, the screen shows **6**. If **1** is clicked after 6, **61** is showed on the screen.
 - iii. Whenever any of the +, -, *, / button is pressed, the value shown on the screen is stored in a variable and the screen shows either **nothing** or a **zero**.
 - iv. **Step ii** is repeated until the = button is clicked.

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- v. Whenever = button is clicked, the value showed on the screen is stored in another variable and calculation is done with the two variables according to the operator clicked in *Step iii*.

Sample Calculation:

$$\begin{array}{llll} 617 + 912 = 1529 & 50.2 + 6.2 = 56.4 & 912 - 617 = 295 & 50.2 - 6.2 = 44.0 \\ 12 * 2 = 24 & 12 / 2 = 6 & & \end{array}$$

Version 2 (Outside of Assignment):

- The calculator should perform multiple operation at a time.

Sample Calculation:

$$\begin{array}{l} 12 + 2 = 14 = 16 = 18 \\ 12 - 2 = 10 = 8 = 6 \\ 12 * 2 = 24 = 48 = 96 \\ 12 / 2 = 6 = 3 = 1.5 \end{array}$$

$$15 + 24 / 3 - 5 * 4 + 10 = 42 \text{ or } 13$$

Both are correct. 1st one is using First Operator Operation First and the 2nd one is using BODMAS. You can do, anyone you want.

$$15 + 24 = / 3 = - 5 = * 4 = + 10 = 42$$

Version 3 (Outside of Assignment):

- The calculator should perform basic memory operations. Add **4 buttons for Memory**. The buttons are: **M+**, **M-**, **MR** and **MC**. These buttons perform their regular operations. We have already discussed about these buttons in class. If you do not remember, just give a search in google. If you still do not understand, mail me.

You will have to use FileIO to store the memory value.

Version 4 (Outside of Assignment):

- The calculator should store all the operations ever made in a file. Add **1 button for History**. Whenever an operation is made, it is written in a file. Whenever the history button is clicked, all the content of the history file is shown in another GUI. This new GUI has a **BackButton**. Clicking on this button, a user can go back to the calculator.
- The calculator also has a **ClearHistory** button. It clears all the contents of the history file.

You will have to use FileIO to store the history. Unless, the **ClearHistory** button is clicked, all the operations since the very **first-time-run** of the calculator should be displayed.