Winter Time

You are expected to implement a graphical user interface where the user can create tree(s), ornament(s), present(s) on the canvas by clicking the mouse.

Part 1- Creating GUI – 20 points
When you run the program, the GUI should start like this:

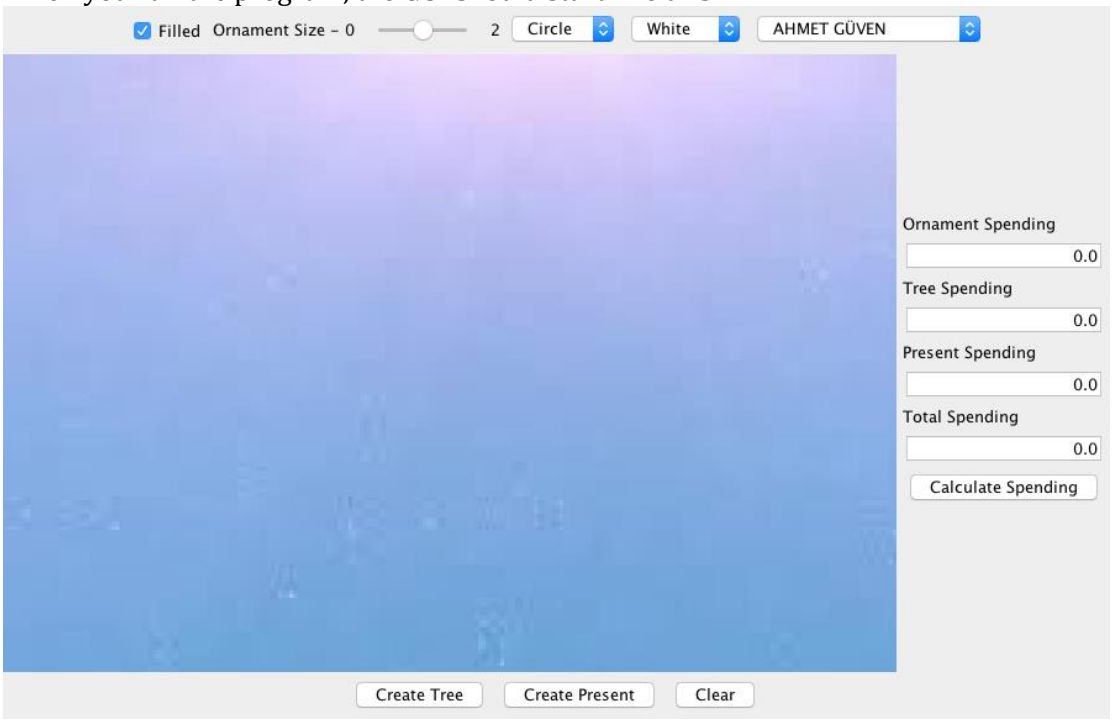

Figure 1. The initial look of your GUI design.

The GUI consists of the following interactors as shown in Figure 1:

1. 4 buttons - "Create Tree", "Create Present", "Calculate Spending", "Clear" buttons
2. 1 Filled check box
3. 6 Labels – displaying ornament min, max size and spending values
4. 1 Slider – for selecting ornament size
5. 3 Combo box – one for selecting ornament type, one for selecting ornament color, one for selecting student names
6. 4 DoubleFields – for displaying the spending amounts
7. A background image – a list of possible background images are provided in the code.

Part 2- Creating Tree(s) – 10 points

1. The user should create a tree object by clicking a button called **"Create Tree".**
2. The Y coordinate of the tree is provided as a constant in the code. However, the X coordinate of the tree should be **arbitrary selected** using a random generator.
3. The constant required to create the tree structure is provided in the code. Create a tree as shown in sample output.

Part 3- Creating Ornament(s) – 20 points

4. The user can create an ornament on a tree. However, if there is no tree on the canvas, no ornament should be created.
5. The user can select the size of ornament using a **slider**. An ornament can be of **small, medium and large** size. The slider should note the minimum value as 0, maximum value as 2 and initial value as 1.

6. The user can select the ornament type. The type of the ornament can be selected from a **Combo Box.** There should be **"Circle", "Oval" and "Star"** ornament types in Combo box. The default selection should be "Circle".
7. Once selected the star shape ornament, the code should create a star shape ornament using the size, color defined by the user.
8. The user can create an ornament on the canvas by clicking anywhere in the canvas. The X and Y coordinates of the ornament should be the X and Y coordinates of the mouse click.
9. The user should be able to select the fill color of the ornament from a **Combo Box**. The combo box should allow the selection of **"White", "Red", "Blue" and "Yellow"** colors. The default selection should be "White".
10. The user should select a **Checkbox** to indicate whether the ornament should be filled or not. The default selection should be "Filled".

Part 4- Create Present – 15 points

11. The program should **randomly select** 5 student(s) from the list and displays the name and last name in a combo box.
12. The program shall use the ArrayList given in the code for storing student names. The method for putting the student names/lastnames are given in the code. DO NOT REMOVE this method. In this code, the format of the String is as such : Lastname; Name, separated by ";".
13. The names in the combo box should be displayed as First Name and Lastname. Separated by a space " ". The list should be **sorted from A-Z** using the first name.
14. The user should select a student name from the **combo box** and click on a button called **"Create Present"** and create a present with the **initials** of the student on it.
15. The present is a **Rectangle shape** and contains **a label** with the initials of the student. The initials should contain the first characters of the first name, all middle names and last name. They should be capitalized and displayed in the middle of the rectangle.
16. The color of the present should be **randomly** selected by the program.
17. The **X location** of the present should be randomly selected by the program. However, the **Y coordinate** of the present is provided as a constant in the code.

Part 5- Calculate Spending – 20 points

18. The user can create many trees, ornaments and presents. There is a **pricing** associated with each tree, ornament and present. These are provided as constants in the code.
19. The user should be able to click on a button called **"Calculate Spending"** and the program should display the current price of each spending in the console; calculate and display the total amount of spending in the console.
20. Once clicked on this button, the program should also write the calculated total prices into the DoubleFields in the GUI.

Part 6-Creating Snow – 10 points

21. The program should randomly simulate snowing. The speed of the snow shall be randomly defined.
22. The snow shall be created using a white circle. It should start snowing from top to the ground and be collected at the ground.

Part 7-Clearing GUI – 5 points

23. The user should clear all the trees, ornaments and presents on the canvas once clicked on a button called "Clear". The spending should be cleared in the GUI as well.

Important Notes:

- You should implement **Comp130_Final_F18.java** file. Signature of the following methods are provided in this code and you should implement the details.
    - **public void init()** – method to initialize the gui

- **public void actionPerformed (ActionEvent e)** – method to handle action events.
- **public void mouseClicked (MouseEvent e)** – the method to handle the mouse click events.

- Additional methods are also provided in the code. Feel free to use them as such or modify them according to your needs.
- A code for playing a music is provided in the code as well, feel free to use it or modify it.
- Necessary instance variables and constants are declared. However, you can create additional instance, local variables and constants. However, you SHOULD NOT replace the existing variables provided to you.
- You can implement more helper methods if needed

Screen shot of a sample run:

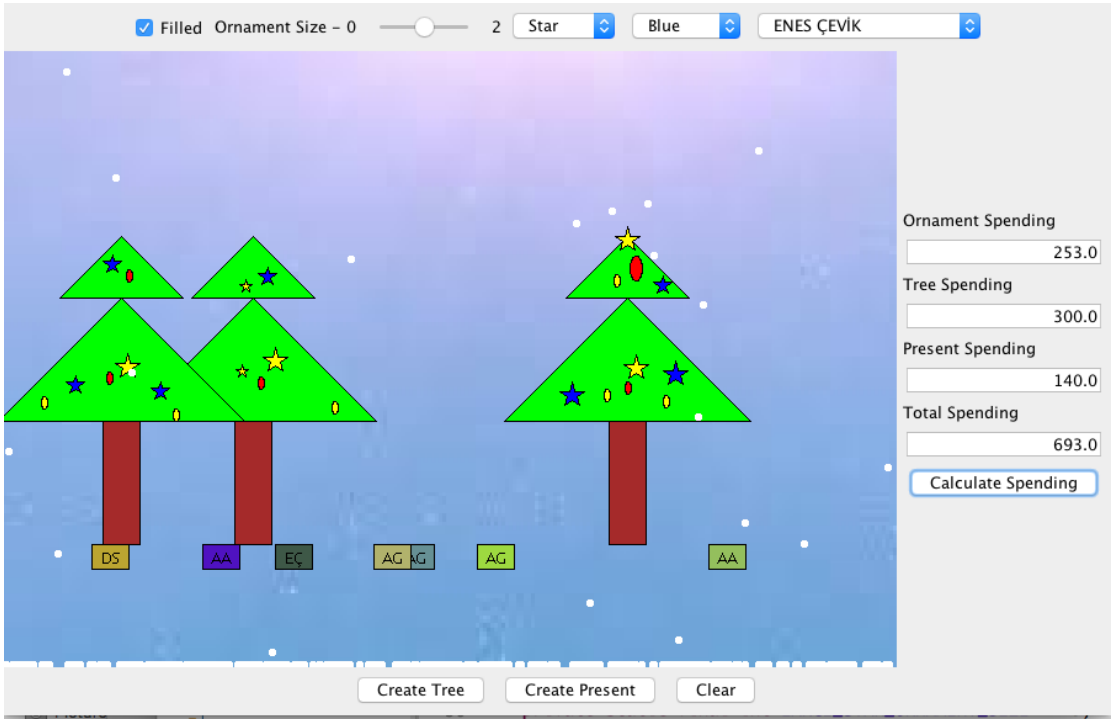

Figure 3. Sample run.

Screen shot of a sample output.txt: