CS203 Java Programming and Applications
Winter 2019

Assignment 4 (4 Questions, 100 marks)

Assigned Date: March 25, 2019
Due Date: April 17, 2019 @ 12:00 pm (Noon)

QUESTION 1 (25 Marks) Characters around circle

Write a program that displays a string `"Welcome to Java "` around a circle, as shown in Figure 1. Note there is a space at the end of the string. Hint: Create a `Text` instance for each character. You need to display each character in the right location with appropriate rotation using a loop.

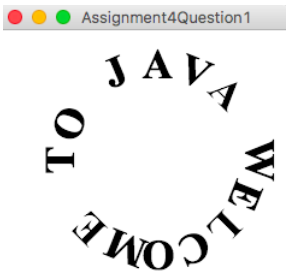


Figure 1: A string is displayed around the circle

QUESTION 2 (25 Marks) Draw a detailed clock

Modify the `ClockPane` class discussed in the lecture to draw the clock with more details on the hours and minutes, as shown in Figure 2. Name the class as `DetailedClockPane`. Write `DetailedClockPane` by modifying `ClockPane`. Do not let `DetailedClockPane` extend `ClockPane`. Write a complete `DetailedClockPane` class by providing proper constructors, setter and getter methods, and other methods necessary in your implementation. You also need to include your test program in your submission. The file `ClockPane.java` is given.

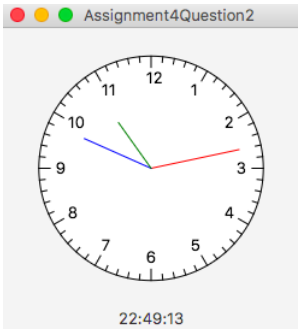
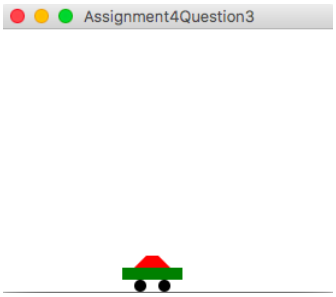


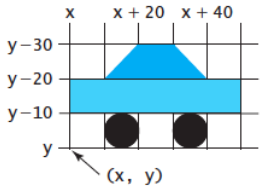
Figure 2: A detailed clock

QUESTION 3 (25 Marks) Racing car

Write a program that simulates car racing, as shown in Figure 3(a). The car moves from left to right. When it hits the right end, it restarts from the left and continues the same process. You can use a timer to control animation. Redraw the car with a new base point (x, y), as shown in Figure 3(b). Also let the user pause/resume the animation with a button press/release and increase/decrease the car speed by pressing the UP and DOWN arrow keys.



(a) The program displays a moving car.



(b) You can redraw a car with a new base point.

Figure 3: Racing car

QUESTION 4 (25 Marks) Count-down stopwatch

Write a program that allows the user to enter time in seconds in the text field and press the *Enter* key to count down the seconds, as shown in Figure 4. The remaining seconds are redisplayed every one second. When the seconds are expired, the program starts to play music continuously. The music file `music.mp3` is given.

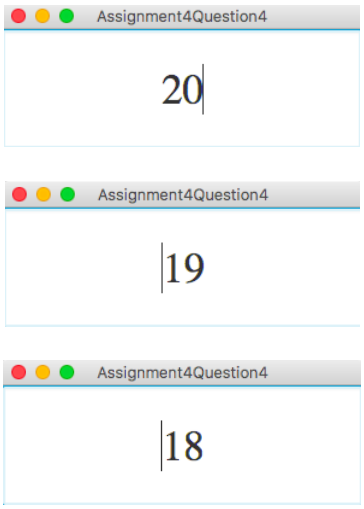


Figure 4: The program counts down the time