Assignment for Mid Term Exam

CSE 215 Spring 2021

Deadline: 6th April 2021

1) Write a Java program which first generates a set of random numbers and then determines negative, positive even, positive odd numbers concurrently.

2) Your job is to implement the simulation of an assembly line that will build Cars. Each Car is made up of several components: tires, seats, engine and frame. Each of these components takes a different amount of time to build on their own. Here's the breakdown on the simulated time each component takes to construct:

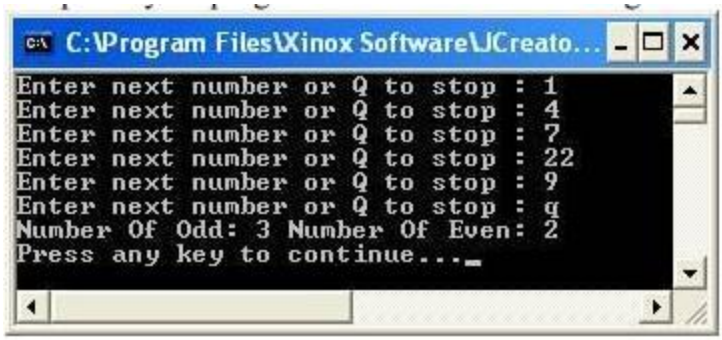
   - Tire – 2 seconds
   - Seats – 3 seconds
   - Engine – 7 seconds
   - Frame – 5 seconds

   With these times, you must implement the code that will simulate the construction of each of these components individually, then once all the necessary components are built you must put them together to make a car. To build a car, you'll need 4 tires, 5 seats, 1 engine and 1 frame. Here's the catch, the assembly line can only and should only be capable of building 3 Components at any given time. You'll need to implement this in your code.

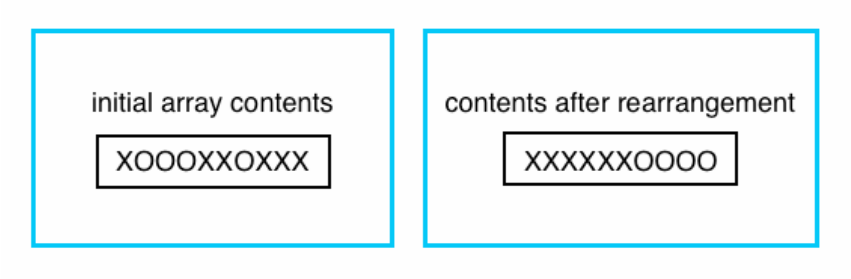
   Design the model how you will solve it and then implement it using Java.

3) Write Java program involving two classes: ***OddAndEven*** and ***TestOddAndEven***. ***OddAndEven*** has the following:
   • Instance variables countOfOdd and countOfEven both of type int
   • A method addNumber that takes a number as parameter and increment countOfOdd, if the number is odd, else increment countOfEven.
   • A method toString that returns a string in the form: "Number of Odd: x, Number of Even: y", where x and y are the values of the instance variables.
   The TestOddAndEven class first creates OddAndEven object, then in a loop, read a number and use it to call the addNumber method until the user enters Q. Finally, it prints the count of odd and even numbers entered.

   Output of your program must be in the following format:



4) Suppose you have a character array that contains X's and O's, and you want to rearrange the contents of this array so that all the X's precede all the O's, as shown in the example below. Write a java program to solve the problem.



5) Define a Java class *"Student"* having private members – *id, department, quizmarks*. Define default and parameterized constructors. Create a subclass called *"Firstyearstudent"* with private member *finalmarks.* Define methods accept and display in both the classes. Create 3 objects of the Student class and display the details of the Student having the total marks (quizmarks + finalmarks.)