

CS203 Java Programming and Applications Fall 2022

Assignment II

Due Date: 1st November @ 23:59

Submit a zip file of pdf of the section A, a .java file of the section B along side with screenshot of the output of your code.

Section A

1. What will be the output of the following Java program? (1 mark)

```
1.      class output
2.      {
3.      public static void main(String args[])
4.      {
5.      StringBuffer s1 = new StringBuffer("Regina");
6.      StringBuffer s2 = s1.reverse();
7.      System.out.println(s2);
8.      }
9.      }
```

- a) ReginaanigeR
b) anigeR
c) anigeRanigeR
d) Regina
2. Which one of the following is not an access modifier? (1 mark)
- a) Protected
b) Void
c) Public
d) Private
3. Which of the following is a valid declaration of an object of class Uofr? (1 mark)
- a) new Uofr obj;
b) Uofr obj = new Uofr;
c) obj = new Uofr ();
d) Uofr obj = new Uofr();
4. Which of the following statements is correct? (1 mark)
- a) Public method can only be called by object of its class
b) Public method is accessible only to subclasses of its parent class
c) Public method is accessible to all other classes in the hierarchy
d) Public method can be accessed by calling object of the public class

5. Which of these methods of class String is used to compare two String objects for their equality? (1 mark)
- a) equals()
 - b) Equals()
 - c) ismatches()
 - d) matches()
6. Which data type value is returned by equals() and matches() method of the String class? (1 mark)
- a) char
 - b) literals
 - c) boolean
 - d) all of the mentioned
7. Where is an array stored in memory? (1 mark)
- a) heap space and stack space
 - b) stack space
 - c) heap space
 - d) first generation memory
8. What is false about constructor? (1 mark)
- a) Constructor can have a return type
 - b) Java does not provide a default copy constructor
 - c) Constructors cannot be synchronized in Java
 - d) “this” and “super” can be used in a constructor
9. Abstract class can have a constructor. (1 mark)
- a) True
 - b) False
10. What behaviour would be if the constructor has a return type? (1 mark)
- a) Compilation error
 - b) Runtime error
 - c) Compilation and runs successfully
 - d) Only String return type is allowed

SECTION B – 90 marks

1. Write a java program to implement a queue as a class abstraction (30 marks).

QueueOfIntegers	
-elements	An array to store integers in the queue
-size:int	The number of integers in the queue
+QueueofIntegers()	Constructs an empty queue with a default capacity of 16
+QueueofIntegers(capacity:int)	Constructs an empty queue with a specified capacity
+empty():boolean	Returns true if the queue is empty
+add()	Inserts the specified element into the queue. If the task is successful, add() returns true, if not it throws an exception.
+offer()	Inserts the specified element into the queue. If the task is successful, offer() returns true, if not it returns false.
+peek()	Returns the head of the queue. Returns null if the queue is empty.
-element()	Returns the head of the queue. Throws an exception if the queue is empty.
-remove()	Returns and removes the head of the queue. Throws an exception if the queue is empty
-poll()	Returns and removes the head of the queue. Returns “null” if the queue is empty

- i. The programs must declare and implements the Class QueueOfIntegers with all the data fields, constructors, and methods up above. (*Class abstraction – different class and implemented in the main class*).
- ii. The program must ask a user to enter to set of integers and apply the above methods as an option.

Like:

1. empty()
2. add()
3. offer()
4. peek()
5. element()
6. remove()
7. poll()

Note: Remember to comment your code

2. Write a program that using class abstraction that take a list of 10 integers and a key (an integer) from a user, The program goes ahead to return the location of the key using binary search. (20marks).
 - i. You need to create a class that contains methods for implementing a sorting algorithm of your choice. And a method for implementing binary sorting.

Note: Don't use the in-build sorting algorithm or in-build binary search if it exists.

3. Using Class abstraction develop the Tic Tac Toe Game in Java (40 marks).
 - i. Implement a two-player gaming logic.