Java Sample S1 2022 (provided by Monash)

Question 1

What would the following expressions return if executed by Java?

! (5 < 6)

false

Question 2

What would the following expressions return if executed by Java?

7 % 15

7

Question 3

What would the following expressions return if executed by Java?

"Java" + 3

java3

Question 4

What would be the value of the variable **amount**, after the evaluation of the following piece of Java code?

```
int amount = 6;
amount--;
```

5

Question 5

What would be the value of the variable **amount**, after the evaluation of the following piece of Java code?

```
int amount = 9;
amount *= amount;
```

81

Question 6

Write a declaration for a private field named **tutorialGroup** that can hold an **ArrayList** of objects of the class **Student**.

```
private ArrayList<Student> tutorialGroup
```

A: private ArrayList<Student> tutorialGroup;

Q1: How to initial it in the default constructor?

public ArrayListConstructorDemo()

{

   String string = "null";

   list = new ArrayList<String>();

}

Q2: How to init in the non-default constructor?

public ArrayListConstructorDemo(String string,List<String> list)

{

   this.string = string;

   this.list = list;

}

Q3: If we already init it in the default and non-default constructor, if we can assign a new value in the method as well? (e.g : tutorialGroup = new ArrayList<>();

Question 7

Assume that temp, b and c are declared as integers and have been initialised. Explain the purpose of the following segment of code.

```
temp = b;
b = c;
c = temp;
```

Swap b c value

Question 8

Explain the purpose of the following segment of code:

```
boolean valid = true;
for (int i = 0; i < numbers.length - 1; i++)
{
    if (numbers[i] > numbers[i+1])
        valid = false;
}
```

compare and see if every the digits in the number is not in an ascending style.

if not the number is not valid (valid== false)

Question 9

Suggest a good name for method4 below, that reflects its purpose.

```
public float method4(int[] numbers)
{
    float sum = 0.0f;
    for (int index = 0; index < numbers.length; index ++)
        sum += numbers[index];
    return sum / numbers.length;
}
```

listAverageNum

Question 10

Complete the following **for** loop to print out the names of all the **Player** objects (stored in an arraylist) who are more than 30 years old.

Assume that the **Player** class is already defined elsewhere, and has a **display()** method in it, along with all the usual **get/set** methods.

Each **Player** object has 2 attributes : a **name** (String) and an **age** (int).

Also assume there is a variable named **players**, which is an **ArrayList** of **Player** objects, and this variable has been initialised elsewhere. You may declare any other variables in your code as needed.

```
for (                                          )
{
//Write the code that goes here below. Include the full definition of the for loop as well.
}
```

```java
for (Player player: players)
{
  if(player.getAge() > 30)
  {
    System.out.print(player.getName() + " ");
  }
  System.out.println();
}
```

```java
for (int i = 0; i< players.size(); i++)
{
if (players.get(i).getAge() > 30)
System.out.println(players.get(i).getName());
}
//another way
for (Player player : players )
{
if (player .getAge() > 30)
System.out.println(player.getName());
```

Q1: What is the difference between array and arraylist?

Week5 – Collections

	初始化	增加	删除	修改	查询	长度
Array	int[] names = new int[]; int[] myNum = {10, 20, 30, 40};	names[0] = "Tom";	names[0] = null;	names[0] = "Tom";	names[0];	names.length
ArrayList	List<String> names = new ArrayList<String>(); List<String> capitals = Arrays.asList("Prague", "Bratislava"); ArrayList<String> cars = new ArrayList<String>();	names.add("Manjaro");	names.remove(1);	names.set(1, "Tom");	names.get(i);	names.size();
HashSet	HashSet<String> cars = new HashSet<String>();	cars.add("Volvo");	cars.remove("Volvo");		查询是否存在 cars.contains("Mazda");	cars.size();
HashMap	HashMap<String, String> capitals = new HashMap<String, String>();	capitals.put("England", "London");	capitals.remove("England");	capitals.put("England", "London");	capitals.get("England");	capitals.size()

32. Differentiate between an Array and an ArrayList.

Array	ArrayList
java.util.Array is a class	java.util.ArrayList is a class
It is strongly typed	It is loosely types
Cannot be dynamically resized	Can be dynamically resized
No need to box and unbox the elements	Needs to box and unbox the elements

Q2: What is the difference between for loop and for-each loop, as for-each loop has less code as for loop, why we need for loop as well? (index / id)

3. for each loop /while /for loop，4 种 loop 的写法，必要时候掌握迭代 iterator 的写法

```
// create an array
int[] numbers = {3, 9, 5, -5};

// for each loop
for (int number: numbers) {
  System.out.println(number);
}

int i = 0;
while (i < 5) {
  System.out.println(i);
  i++;
}

for (statement 1; statement 2; statement 3) {
  // code block to be executed
}
```

Statement 1 is executed (one time) before the execution of the code block.
Statement 2 defines the condition for executing the code block.

Statement 3 is executed (every time) after the code block has been executed.

Question 11

Write a method which will be pass an array of strings as its only formal parameter, and returns the longest string in that array

```java
public String getLongestString(String[] array) {
        String longest = array[0];
        for (int i=1; i<array.length; i++) {
                if (array[i].length() > longest.length()) {
                        longest = array[i];
                }
        }
        return longest;
    }
```

Question 12

The following code has 5 errors in total. The errors may be syntax errors and/or logic errors.

When answering this question, please state the line number which you think is incorrect, and suggest the correct code which needs to be used instead.

Only select 5 errors. Selecting more, will result in no marks being awarded for the question.

The following code is intended to check the validity of a given postcode in Victoria. A postcode is **valid** if it is

· **exactly 4 characters** long and

· all characters must be **between 0 and 9** and

· the **first character must be 3**

If a postcode is valid, the program would return true. Otherwise, it would return false.

```
1. public String validatePostcode(String postcode)
2. {
3.      boolean str = false;
4.      if(postcode.length!=4)
5.          str = false;
6.      else
7.      {
8.          if(postcode.charAt(0)==' 3 ')
9.              str = false;
10.         for(int i=1; i<postcode.length()-1; i++)
11.         {
12.             if(postcode.charAt(i)<' 0 ' && postcode.charAt(i)>' 9 ')
13.                 str = false;
14.         }
15.     }
16.     return String;
17. }
```

1. logic error: should return a boolean result if we want to validate a String

8 . logic error the first character must be 3 whereas in this one the first one must not be 3.

10 logic error : won't check the last character in this case

12 logic error: shouldn't use &&, should use ||

13 syntax error: String is not defined

Question 13

Check the content on ed platform - mock exam S1 2022.

```
21: case 'Z' : break;
27 if (choice != 'Z')
34 amount -= price;
35 System.out.println("Your change is $" + (amount));
```

Line 21: case'Z': break;

Line 25: while(choice != 'Z' && amount < price); -> 2 errors corrected

Line 27: if(choise != 'Z')

Line 14: choice = console.nextLine().charAt(0)

Line 21: remove case'Z'

Line 25: while(choice != 'Z' || amount <= price);

TBD