

1) What are the components of Java platform? Explain. Write a Java program to illustrate the usage of condition statements and looping statement.

A. Java plat form:

Java platform is a software or collection of programs that help us to execute application written in Java programming language. A Java platform consists of a Java compiler, a set of libraries and execution engine.

* Java platform is independent of any particular OS. Which makes Java programming an independent language.

* Java platform consists of the following components.

→ Java language

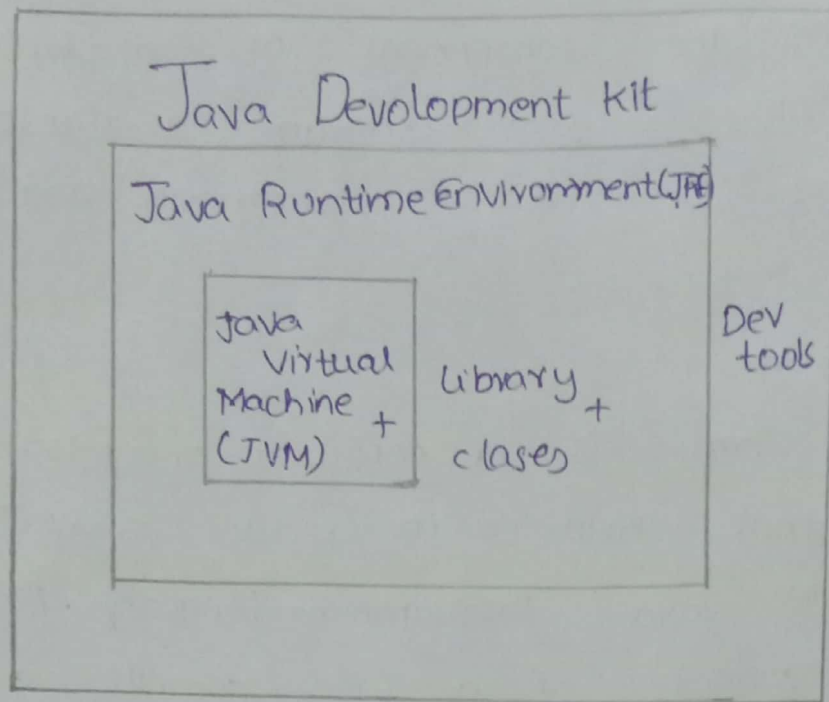
→ The Java development kit (JDK)

→ The Java Runtime environment (JRE)

→ The Java compiler.

→ The Java virtual machine.

• Apart from the above main components, the Java platform also contains garbage collectors, a set of libraries and other additional components and tools that are required to efficiently run the Java application.



$JRE = JVM + \text{Library classes}$

$JDK = JRE + \text{Developer tools}$

→ Java language:

Java is programming language that the Java platform uses. Java is object-oriented programming language whose syntax is derived from C and C++ and its features are derived from C++ It has its syntax, rules, format and programming paradigm.

→ The Java compiler:

This is a compiler for Java programming language and its function is to generate Java class files from the Java source code. Java class file contains a platform independent Java byte code.

- After generating class files, JVM loads these class files and either interprets the byte code or compile it to machine code using Just-In-Time compiler (JIT)

→ The Java Virtual Machine (JVM):-

- JVM is the centre of Java Programming language and Java platform. The JVM converts the byte code into a machine - specific code.
- JVM Provides the functionality of garbage collection memory management, security etc; JVM is a platform independent and we can customize its functionality using a virtual interface it provides which is not machine - dependent and is also dependent of the OS.
- This platform - independence of JVM allows us to create Java Programs on one machine (WORA - Write-Once Run-Anywhere).

→ The Java Runtime Environment (JRE):-

JRE, as the name suggests, is the runtime environment that is required to execute Java Programs and applications. JRE consists of JVM and Binaries and other classes. to successful execute Java Programs.

- JRE is a subset of JDK and doesn't contain any development tools such as Java compiler, debugger etc;

- The JRE includes the following components.

- Code libraries property setting and resource file.

- DLL files.

- Java extension file

- Files.

- Applet support classes.

- True type font file.

★ To execute any program/application written in Java, you need JRE installed in your system.

- The Java Development Kit (JDK)

- This is the core component of any Java environment. JDK contains JRE along with Java compiler, Java debugger and other core classes.

- JDK is used for Java development as it provides the entire executable and binaries as well as tools required to compile debug a Java program.

- JDK is a platform-specific software and thus we will have separate JDK installers for each OS.

★ JDK contains the following components:

- Jconsole: This is a Java monitoring and management console.

- Jar: This is the archiver. This tool is used to package related class libraries into a single jar file as well as to manage Jar file.

- Jar signer: This tool is used for Jar signing and verifying.

- Javap: This is a tool for class file disassembler.

- Jaws: Java is webstart launcher for JNLP application.

- Jstack: Utility used to print stack traces for Java threads.

- Javadoc: This automatically generates documentation from the source code comments.

- applet viewer: used for applet execution and debugging without a web browser.

- apt: Annotation processing tools.

- keytool: Using this ability you can manipulate key store.

- XJC: This is a part of XML binding (JAXB) API that accepts XML schema and generates Java classes.

→ All these including Java language core components of a parent entity called Java platform which is an environment that helps to run Java program.

★ Explain to illustrate the usage of conditional and looping statement.

```
import java.util.*;
```

```
public class Assignment
```

```
{
```

```
    static Scanner sc = new Scanner (System.in);
```

```
    void product of Digits () {
```

```
        int r=1
```

```
        int n=sc.nextInt();
```

```
        while (n!=0){
```

```
            r* = n%10;
```

```
            n = n/10;
```

```
        } System.out.println ("Product "+r);
```

```
    }
```

```
    void pattern () {
```

```
        int n1 = sc.nextInt();
```

```
        for (int i=1; i<=n1; i++){
```

```
            for (int j=1; j<=i; j++){
```

```
                System.out.print ("* ");
```

```
            System.out.println();
```

```
        }
```

```
    } public static void main (String[] args) {
```

```
        Assignment obj = new Assignment();
```

```
        int n=sc.nextInt();
```

```
        switch (n) {
```

```
            case 1: obj.product of Digits (); break;
```

```
            case 2: obj.pattern (); break;
```

```
            default: System.out.println ("INVALID INPUT");
```

```
        }
```

```
    }
```


2) write any six significant difference between procedure oriented Programming and object oriented programming
Why JAVA is Robust Programming language? Explain.

A. Procedure oriented programming	object oriented programming.
<ul style="list-style-type: none"> • Program is divided into small parts called function • Follows top-down approach • Has no access specifier • Adding a new data and function is not easy • doesn't have proper way of hiding data, so it is less secure • overloading is not possible. • Function is more important than data. • Based on unreal world. 	<ul style="list-style-type: none"> • Programs is divided into small parts called objects. • Follow bottom up approach. • Have access specifier like private, public, protected etc. • Adding a new data and function is easy. • Provides data hiding so it is more secure. • overloading is possible. • Data is more important than function. • Based on real world.
<u>ex</u> C, FORTRAN, Pascal, Basic etc;	<u>ex</u> C++, Java, Python, etc;

Java is a Robust language. Below are the features which make Java programming language Robust.

- Built-in Memory Management

Memory allocation / deallocation is performed internally in Java and pointers are not exposed to the developer. Hence run time segmentation, fault kind of errors (due to pointers misuse) do not occur.

- Garbage collector: Since Garbage collector automatically cleans referenced objects, memory leaks are controlled.

- Exception handling: Avoids Application crash & lets programs to easily expectation scenarios and improve robustness.

- Certain features of Java compiler such as Strongly typed:

Avoid automatic conversion, which reduces unexpected run time behavior.

→ So robustness characteristic of Java lets Java Applications to run with minimal / no runtime errors relatively.

3. Define a class parkingslot with the following description.

Instance variable/ data members,

int vno - To store the vehicle number

int hours - To store the number of hours the vehicle is parked in the parking lot.

double bill - To store the bill amount

Member methods:

void input () - To input and store vno and hours.

void calculate () - To compute the parking charge at the rate of Rs.3 for the first hours or park there of and Rs 1.50 for each additional hour or past there of.

void display () - To display the detail.

write a method to create an object of the class and call the above method.

```

A) import java.util.*;

class parking lot {
    int Uno, hours;
    double bill;

    void input () {
        Scanner sc = new Scanner (System.in);
        Uno = sc.nextInt();
        hours = sc.nextInt();
    }

    void calculate () {
        bill = 3 + (hours - 1) * 1.50;
    }

    void display () {
        System.out.print ("Told Amount: Rs" + bill);
    }

    public static void main (String[] args) {
        parking lot parkinglot = new parking lot ();
        parking lot.input ();
        parking lot.calculate ();
        parking lot.display ();
    }
}

```

Sample input :

1234

5

sample output :

Total amount = Rs 9.3.

4. Design a class to overload a function Joystring() as follows!.

(i) Void Joystring (Strings, char ch1, char ch2) with one string and two characters arguments that replaces the character argument ch1 with the character argument ch2 in the given strings and prints the new string

Ex:

Input

S = "TECHNALABLY"

ch1 = "A"

ch2 = "O"

Output: "TECHNOLOGY"

(ii) Void Joy (string s) with one string argument that prints the position of the first space and the last space of the java strings s.

Ex: Input:

S = "cloud computing means Internet based computing"

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(iii) Void Joystring (string s1, string s2) with two string arguments that combines the two strings with a space between them and prints the resultant string.

Ex: Input:

S1 = "COMMON WEALTH"

S2 = "GAMES"

Output : "common WEALTH GAMES"

A. import java.util.*;
public class Overload {

void JoyString (String s, char ch (1), char ch (2)) {

String op = "";

for (int i=0, i < s.length(); i++) {

char ch = s.charAt(i);

if (ch == ch1)

ch = ch2;

op += ch;

}

System.out.println(op);

}

void JoyString (String s) {

int in=0;

int sp=0;

for (int i=0, i < s.length(); i++) {

char ch = s.charAt(i);

if (ch == " ") {

in = 1;

++sp;

if (sp == 1)

System.out.println("First Index " + in);

}

```

    }
    System.out.println("last Index : " + in);
}
void Joysting (String s1, String s2) {
    System.out.println(s1 + " " + s2);
}
}
Public static void main (String [] args) {
    Over load Obj = new Overload();
    String s = "TECHNOLOGY";
    char ch1 = 'A';
    char ch2 = 'O';
    String ss = "cloud computing means Internet based
                computing";
    String s1 = "COMMON WEALTH";
    String s2 = "GAMES";
    Obj.Joysting (s1, ch1, ch2);
    Obj.Joysting (ss);
    Obj.Joysting (s1, s2);
}
}

```

Output :

TECHNOLOGY

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COMMON WEALTH GAMES

source

1. softwaretestinghelp.com
2. geeksforgeeks.org
- quora.com.