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## Lab Assignment 1 (JP)

AIM: Introduction to Java, SDK, J2EE, JVM, IDE. Write a java program to print the text "Welcome to Java programming world".

### OBJECTIVES:

- 1) To study the architecture of J2EE, JVM.
- 2) To study the basic concepts of Java.
- 3) To study installation steps of JDK.
- 4) To study different java IDEs

### THEORY:

#### (1) SDK:

→ A software development toolkit (SDK) is a set of software tools and programs provided by hardware and software vendors that developers can use to build application for specific platforms.

#### (2) JDK and its installation steps:

→ Java Development Kit is a bundle of software development tools and supporting libraries combined with Java Runtime Environment (JRE) and Java Virtual Machine (JVM).

→ Installation steps for JDK on Windows.

i) Download JDK available at <https://docs.oracle.com/en/java/javase/index.html>

ii) Install it

iii) Create java program

→ Open notepad and write java code.

→ Save file as "Filename.java".

→ Every java program has a class name that must match filename and every program must contain main() method.

iv) Compile and Run

→ To Compile

↳ Open command prompt

↳ type command "javac Filename.java".

→ To execute

- java. Filename.

### ③ J2EE and JVM ARCHITECTURE:

→ J2EE is a platform-independent, Java based environment applicable for developing, building and developing web-based enterprise applications online.

→ J2EE includes various sets of services, APIs and protocols to develop multitier applications.

→ JVM is an abstract machine. It is a specification that provides runtime environment in which java bytecode can be executed.



- JVM is platform - dependent.
- Whenever java command is written on command prompt to run java class, an instance of JVM is created.

## PLATFORM:

- Open Source IDE tool like Eclipse.

## CONCLUSION:

Thus, studied the installation steps of java and implemented the java programs using basic concepts (loops and control statements)

- The J2EE platform consists of a set of services, APIs and protocols that provide functionality for developing multi-tiered, web-based applications.

- Four types of J2EE modules -

- Application client modules
- Web module
- Enterprise JavaBeans module
- Resource adapter module

Q.9 What are the different control statements used in JSP?

Ans There are 3 types of control statements

- Conditional
- Iteration
- Jump

## i) CONDITIONAL:

These control statements help with implementing decision making in a program.

### Syntax:

```
if (test_expression)
    // code
else
    // code
```

## → Nested if statement:

### Syntax -

```
if (condition 1) {
    statement 1;
    if (condition 2) {
        statement 2;
    }
    else {
        statement 3;
    }
}
```

② → ITERATION/LOOPS: Execute a block of code repeatedly until a specific condition is met.

## i) while loop -

### Syntax:

```
while (condition) {
    // code
}
```



• DO while loop

Syntax -

```
do {
```

```
    // code
```

```
} while (condition);
```

• for loop

Syntax -

```
for (initialisation; condition; inc/dec)
```

```
{
```

```
    // statement
```

```
}
```

• Jump

• Break statements - used in loops to terminate execution when encountered.

• do {

```
    // code
```

```
    if (condition to break) {
```

```
        break;
```

```
    }
```

```
    // code
```

```
}
```

```
while (test expression);
```

```

> for (init ; test Exp ; update) {
    // code
    if ( condn to break ) {
        break;
    }
    // code
}

```

→ Continue = skips current iteration of a loop (for, while, do... while etc)

```

while ( testExpression ) {
    // code
    if ( testExpression ) {
        continue;
    }
    // code
}

```

Q1 How is java program executed?

Ans → To run any java program, main class file is passed to JVM and then goes through 3 main stages before final machine code is executed.

→ These 3 stages include classloader, byte-code verifier and Just in time compiler.

→ following commands are used to compile and run

- java -C filename.java
- java filename



Q2 What is use of JVM?

- JVM is responsible for converting bytecode to machine specific code. It is necessary in both JDK & JRE.
- It is also platform dependent and performs many functions, including memory management and security.

Q3 Explain the J2EE module:

- J2EE is an environment for developing and deploying enterprise applications.
- Four types of J2EE modules.
  - i) Application client module.
  - ii) Web module.
  - iii) Enterprise JavaBeans module.
  - iv) Resource adapter module.

Q4 Explain different Java primitive data types.

Ans. INTEGER TYPES

- Byte - Stores whole numbers from -128 to 127.
- Short - Stores whole numbers from -32768 to 32767.
- Int - Stores whole numbers from -2147483648 to 2147483647.
- Long - Stores whole nos from -9223372036854775808 to 9223372036854775807.

→ Floating types:

→ float - stores fractional nos from  $3.4E-038$  to  $3.4E+038$

→ double - stores fractional nos from  $1.7E-308$  to  $1.7E+308$

→ scientific nos - 'e' to indicate power of 10

→ BOOLEAN

- Boolean data type is declared with boolean keyword & can only take the values true or false.

→ CHARACTERS:

- stores a single character.

→ STRINGS:

- stores sequence of characters.

Q6 How do break and continue statements work in JSP?

Ans → 'break' statement in Java terminates loop immediately and control of program moves to next statement.

• WORKING

```
while (test expression) {
```

```
    // code
```

```
    if (condition to break) {
```

```
        break;
```

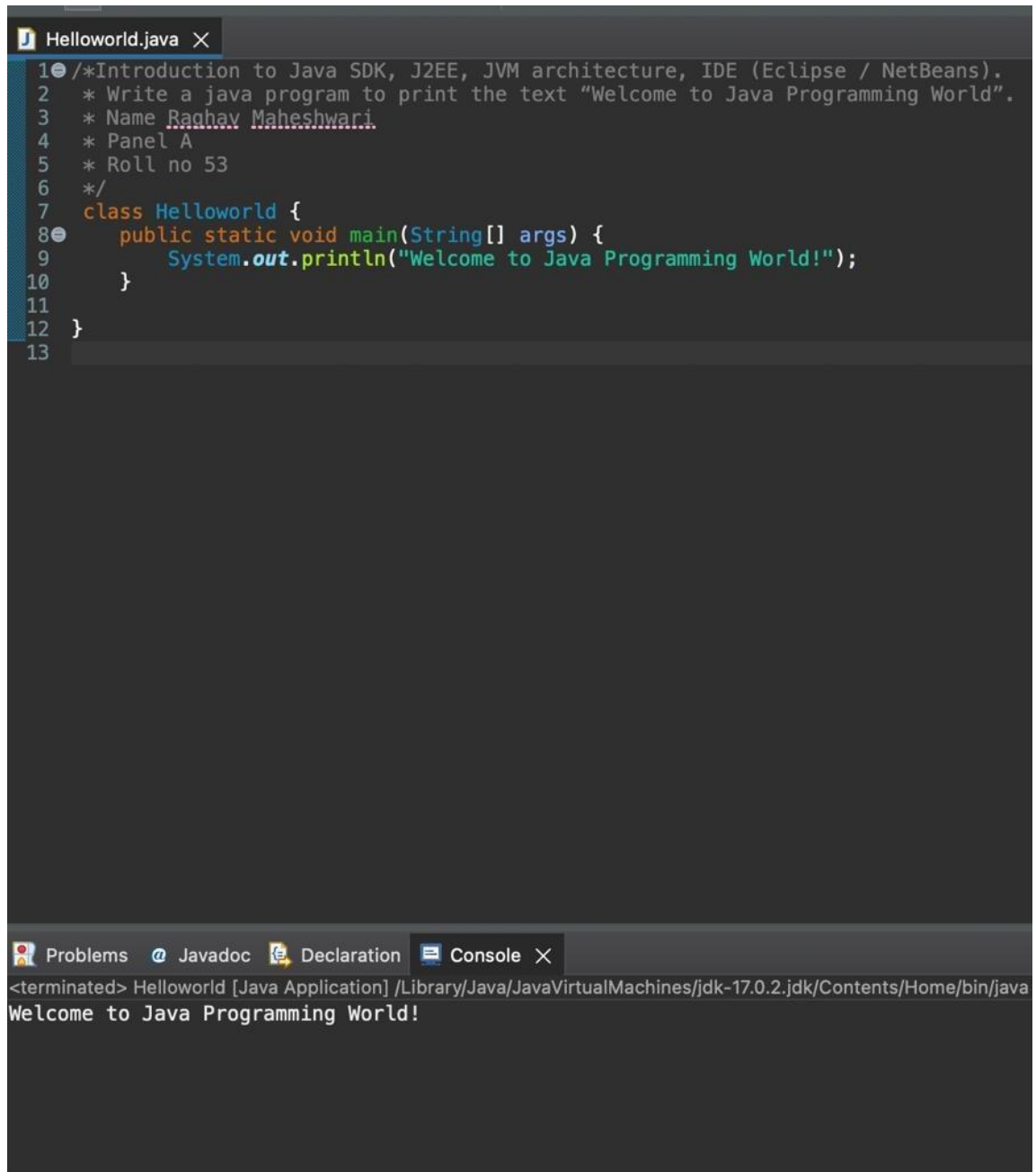
```
    } // code
```

```
}
```

*Scanned*



## CODE AND OUTPUT:



The screenshot shows an IDE with a dark theme. The top editor window, titled 'Helloworld.java', contains a Java program. The code includes a multi-line comment with a title, a description, and author information, followed by a class definition with a main method that prints a welcome message. The bottom panel shows the 'Console' tab with the program's output.

```
1 /*Introduction to Java SDK, J2EE, JVM architecture, IDE (Eclipse / NetBeans).
2  * Write a java program to print the text "Welcome to Java Programming World".
3  * Name Raghav Maheshwari
4  * Panel A
5  * Roll no 53
6  */
7 class Helloworld {
8     public static void main(String[] args) {
9         System.out.println("Welcome to Java Programming World!");
10    }
11 }
12 }
13
```

Problems Javadoc Declaration Console X

<terminated> Helloworld [Java Application] /Library/Java/JavaVirtualMachines/jdk-17.0.2.jdk/Contents/Home/bin/java  
Welcome to Java Programming World!