LAB ACTIVITY 2:

Fundamental of Java Programming

**Learning Outcomes:**

By the end of this laboratory session, you should be able to:

1. Construct classes using Class Diagram.
2. Identify and use identifiers, variables and constants in Java programming.
3. Identify and implement the mathematical, relational and conditional operators in Java programming.
4. Implement type casting to change the data type

**Hardware/Software:** Computer with JDK latest version.



**Activity 2A**

Activity Outcome**:** Identify identifies, variables and constants in Java programming

Program below illustrates the declaration and initialization of variables of byte, short, int and long data type.

Procedure:

**Step 1:** Open Notepad and type the following code:

class Act2A

{

public static void main(String[] args){

// declare variable b as numberB, initialized value,100 into it. byte numberB = 100;

// declare variable s as numberS, initialized 5 value to it

short numberS = 5;

// declare variable numberI as integer, initialized 78 value to it

int numberI = 78;

//declare variable numberL as long, initialized 123456789 value to it

long numberL = 123456789;

//declare variable grade as char, initialized ‘C’ value to it

char grade = 'C';

//declare numberF as float, initialized 3.6F to it

float numberF = 3.6F;

//declare numberD as double, initialized 525.9 to it

double numberD = 525.9;

//declare isPermanent as boolean, initialized false to it

boolean isPermanent = false;

//display value of variables

System.out.println(numberB+","+numberS+","+numberI+","+numberL);

System.out.println(numberF+","+numberD+","+grade+","+isPermanent);

}//end main()

}//end class

**Step 2:** Save, compile and run the program. Save the program as Act2A.java. Write the output in the area below.

**Output:**



**Activity 2B**

Activity Outcome: Identify identifies, variables and constants in Java programming.

Program below illustrates variable and constant declarations:

Procedure:

**Step 1:** Open Notepad and type the following code:

class Act2B

{

public static void main(String[] args)

{

//declare variables radius as int, initialized value 6 to radius.

int radius=6;

//declare constant pi as double, initialized value 3.14 to pi.

final double PI=3.142;

//declare circumference as double.

double circumference;

circumference=2\*PI\*3;

//display output circumference

System.out.println(circumference);

}//end main()

}//end class

**Procedure:**

**Step 2:** Save, compile and run the program. Save the program as Act2B.java. Write the output in the area below.

**Output:**



**Activity 2C**

Activity Outcome : Implement numeric data types in Java Program.

The following program uses primitive data type of byte and short:

Procedures:

**Step 1:** Open Notepad and type the following code:

class Act2C

{

public static void main (String[] args)

{

byte value = 127; //declare & initial variable

System.out.println("Value = " + value);

}//end main()

}//end class

**Step 2:**  Save, compile and run the program. Save the program as Act2C.java. Observe the output.

**Step 3:** Change the value of variable value’s from 127 to 128.

**Step 4:**  Compile and run the program. Observe the output.

**Output:**

**Step 5:** Change the value variable value’s to -129 and try to compile and run the program. What happens?

**Output:**

**Step 6:** Change the data type to short. Compile and run the program. Is there a difference? Explain.

**Explanation:**

**Activity 2D**

Activity Outcome : Implement numeric data types in Java Program.

The following program uses primitive data type of float and double:

Procedures:

**Step 1:** Open Notepad and type the following code:

class Act2D

{

public static void main ( String[] args )

{

//declare constant

final float VALUE\_TAX = 3.4E038F;

System.out.println("Value = " + VALUE\_TAX);

}//end main()

}//end class

**Step 2:**  Save, compile and run the program. Save the program as Act2D.java. Observe the output.

**Output:**

**Step 3:** Change the value of constant value’s from 3.4E038F to 3.4E039F.

**Step 4:**  Compile and run the program. Observe the output.

**Output:**

**Explanation:**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Step 5:** Change the data type of constant value’s to **double**. Compile and run the program. Is there a difference? Explain.

**Output:**

**Explanation:**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Step 6:** Change the value of constant value’s from 3.4E038F to 1.7e308D.

**Step 7:**  Compile and run the program. Observe the output.

**Output:**

**Explanation:**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Activity 2E (CLO2)**

Activity Outcome: Implements character and Boolean data types in Java programs.

The following program uses primitive data type of character and boolean:

Procedures:

**Step 1:** Open Notepad and type the following code:

//Activity 2E

public class Act2E {

public static void main(String[] args) {

//declare variable

char letter;

boolean bool;

//initial@assign value to variable and display it

letter = 'A';

System.out.println(letter);

letter = 'B';

System.out.println(letter);

bool = true;

System.out.println(bool);

bool = false;

System.out.println(bool);

}//end main()

}//end class

**Step 2:**  Save, compile and run the program. Save the program as Act2E.java. Observe the output.

**Output:**



**Activity 2F**

Activity Outcome: Implements mathematical, relational & conditional operators in Java programs.

The following program shows the precedence of the operators, relational & conditional operators.

Procedures:

**Step 1:** Open Notepad and type the following code:

class Act2F{

public static void main (String[] args)

{

//implement precedence of the operators

System.out.println(6 \* 2 / 3);

System.out.println(13 + 12 \* (8-3));

System.out.println(54 + 12 \* 8 - 3);

System.out.println(5 + 21 % 3 - 1);

//implement relational operators

int num1=12;

System.out.println(num1==12);

System.out.println(num1!=12);

if(num1>=0)

System.out.println(“This is positif number”);

else

System.out.println(“This is negetive number”);

//implement conditional operators

int num2=4, num3=6;

if((num2<3) && (num3<10))

System.out.println(“num2 and num3 are in range.”);

if((num>0)||(num3<4))

System.out.println(“num2 and num3 are in range.”);

}//end main()

}//end class

**Step 2:**  Save, compile and run the program. Save the program as Act4F.java. Observe the output.

**Step 2:**  Save, compile and run the program. Save the program as Act2F.java. Observe the output.

**Output:**



**Activity 2G**

Activity Outcome: Implements typecasting in Java programs.

The following program shows the implicit and explicit type casting.

Procedures:

**Step 1:** Open Notepad and type the following code:

class Act2G {

public static void main (String[] args)

{

System.out.println("Variables created");

//variable declaration & initialization

char char1= 'y';

byte numB= 50;

short numS1 = 1996;

int numI = 32770;

long numL= 1234567654321L;

float numF1 = 3.142F;

float numF2 = 1.2e-5F;

double numD = 0.000000987;

//display the value of each variable

System.out.println("char1 = " + char1);

System.out.println("numB = " + numB);

System.out.println("numS1 = " + numS1);

System.out.println("numI = " + numI);

System.out.println("numL = " + numL);

System.out.println("numF1 = " +numF1);

System.out.println("numF2 = " + numF2);

System.out.println("numD = " + numD);

System.out.println(" ");

System.out.println(" Types converted" );

short numS2 = numB; // implicit type casting

short numS3 = (short) numI; //explicit type casting

//from integer change to floating point

float numF3 = (float) numI;

//from floating point turn to be integral type

int numI2 = (int) numF1;

//display the output

System.out.println(" short numS2 = " + numS2);

System.out.println(" short numS3 = " + (short)numI);

System.out.println(" float numF3 = " + numF3);

System.out.println(" int numI2 = " + numI2);

}//end main()

}//end class

**Step 2:**  Save, compile and run the program. Save the program as Act2G.java. Observe the output.

**Output:**

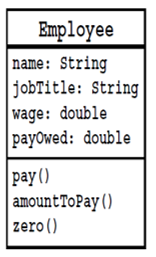
**Activity 2H**

Activity Outcome: Construct classes from Class Diagram

Procedures:

**Step 1**: By using concept of class and object in OOP, identify 1 object.

**Step 2:** Illustrate **the Class Diagram based on the object** with appropriate attributes and method.

Example: 

**Step 3:** Construct a class (java program) based on the Class Diagram in step 2.

**(Post your answers in Padlet**

**Click :** [**https://padlet.com/hazleenaosman/khkj4h61ex31ppga**](https://padlet.com/hazleenaosman/khkj4h61ex31ppga)

**Or Scan this QR**

****