**JAVA**

**Introduction to Java**

**Lab Exercise No:** 1

**Exercise Objective(s):** *Simple java program*

**Exercise:** *Write a program with a class name “Welcome” and display a message as follows: “Welcome to the world of Java”*

**Recommended duration:** *10Mins*

**Solution Guidance (if applicable):** *NA*

**Solution:**

//Simple Welcome to java program

**public** **class** Welcome

{

**public** **static** **void** main(String[] args)

{

System.***out***.println("Welcome to the world of Java");

}

}

**Lab Exercise No:** 2

**Exercise Objective(s):** *Compilation and execution from command line, Concept of object and class*

**Exercise:** *Write a program that takes a console input (Input given by the user while executing the program in command line) and prints the same.*

**Recommended duration:** *10Mins*

**Solution Guidance (if applicable):** *The input can be printed as follows.*

*System.out.println ("Message: "+args [0]);*

**Solution:**

/\*Steps:-

\* Run configurations->Java Application->CommandLineArg->Arguments->Program Arguments->Hello!

\*/

**public** **class** CommandLineArg

{

**public** **static** **void** main(String[] args)

{

//Sending Message as Command Line Argument

System.***out***.println("Message : "+args[0]);

}

}

**Lab Exercise No:** 3

**Exercise Objective(s):** *Comments in java programs and java documentation*

**Exercise:** *Write a program with all the type of comments and execute it. User nested comments also.*

**Recommended duration:** *10Mins*

**Solution Guidance (if applicable):** *NA*

**Solution:**

/\*

\* Demo Comments

\*/

//Welcome Class

**public** **class** Welcome

{

//Main Function

**public** **static** **void** main(String[] args)

{

//Print Message

System.***out***.println("Welcome to the world of Java");

}

}

**JAVA**

**Basic elements of Java**

**Lab Exercise No:** 4

**Exercise Objective(s):** *Primitive data types and their range, Variables, Constants and literals,*

*Conventions*

**Exercise:** *Write a program which declares variables of int, float, double data types and a constant of*

*long data type and displays all with an appropriate message. Follow the naming conventions*

*for all the variables and literals.*

**Recommended duration:** *10Mins*

**Solution Guidance (if applicable):** *NA*

**Solution:**

//Using different datatypes with proper values and naming conventions

**public** **class** DataTypes

{

**public** **static** **void** main(String[] args)

{

**int** departmentId = 4;

**final** **long** employeeId = 1833421000;

**double** salary = 652100.98;

**float** taxPercent = 39.98f;

System.***out***.println("Department ID ==> "+departmentId);

System.***out***.println("Employee ID ==> "+employeeId);

System.***out***.println("Salary ==> "+salary);

System.***out***.println("Tax Percentage ==> "+taxPercent);

}

}

**Lab Exercise No:** 5

**Exercise Objective(s):** *Simple operators*

**Exercise:** *Write a program to get two numbers as input through command line and swap the values of two numbers without using a temporary variable and display the same.*

**Recommended duration:** *20Mins*

**Solution Guidance (if applicable):** *a = a + b*

*b = a – b*

*b = a - b*

**Solution:**

//Swapping of numbers using command line args

**public** **class** Swapping

{

**public** **static** **void** main(String args[])

{

**int** num1=Integer.*parseInt*(args[0]);

**int** num2=Integer.*parseInt*(args[1]);

//calling swapNumbers function

*swapNumbers*(num1,num2);

}

//function to swap two numbers

**public** **static** **void** swapNumbers(**int** no1,**int** no2)

{

System.***out***.println("First Number => "+no1);

System.***out***.println("Second Number => "+no2);

//swapping the numbers

no1=no1+no2;

no2=no1-no2;

no1=no1-no2;

/\*another logic for swapping the numbers

\* int temp=no1;

no1=no2;

no2=temp;

\*/

System.***out***.println("After Swapping the numbers .....");

//displaying the swapped numbers

System.***out***.println("First Number => "+no1);

System.***out***.println("Second Number => "+no2);

}

}

**Lab Exercise No:** 6

**Exercise Objective(s):** *Conditional statements*

**Exercise:** *Write a program to determine whether the given year is leap year or not(Get the input*

*through command line).*

**Recommended duration:** *20Mins*

**Solution Guidance (if applicable):** *NA*

**Solution:**

**public** **class** Year

{

**public** **static** **void** main(String[] args)

{

**int** year = Integer.*parseInt*(args[0]);

//condition to check if it's a leap year

**if**(year%4 == 0)

{

//condition successful display this message

System.***out***.println("It's a Leap Year !!");

}

**else**

{

//condition fails display this message

System.***out***.println("It's not a Leap Year !!");

}

}

}

**Lab Exercise No:** 7

**Exercise Objective(s):** *Conditional statements*

**Exercise:** *Write a program to determine the largest of three numbers.*

**Recommended duration:** *20Mins*

**Solution Guidance (if applicable):** *NA*

**Solution:**

**import** java.util.Scanner;

**public** **class** LargestNumber

{

**public** **static** **void** main(String args[])

{

Scanner s = **new** Scanner(System.***in***);

**int** num1,num2,num3;

//accepting three numbers

System.***out***.println("Fint out the Largets Numbers ....");

System.***out***.println("Enter three numbers ==> ");

num1=s.nextInt();

num2=s.nextInt();

num3=s.nextInt();

//comparing num1 with other two numbers

**if**(num1>num2 && num1>num3)

{

//num1 is the largest num

System.***out***.println("Largest Number is "+num1);

}

//comparing num2 with num3

**else** **if**(num2>num3)

{

//num2 is the largest num

System.***out***.println("Largest Number is "+num2);

}

**else**

{

//num3 is the largest num

System.***out***.println("Largest Number is "+num3);

}

}

}

**Lab Exercise No:** 8

**Exercise Objective(s):** *Loops*

**Exercise:** *Write a program to determine whether a number is a palindrome or not.*

**Recommended duration:** *20Mins*

**Solution Guidance (if applicable):** *NA*

**Solution:**

**import** java.util.Scanner;

**public** **class** Palindrome

{

**public** **static** **void** main(String[] args)

{

Scanner s = **new** Scanner(System.***in***);

System.***out***.println("Enter a number ==> ");

**int** num=s.nextInt();

**int** remainder=0;

**int** reverseNumber=0;

**int** no;

//making a copy of accepted number

no=num;

//loop to reverse the number

**while**(no!=0)

{

remainder=no%10;

no=no/10;

reverseNumber=reverseNumber\*10+remainder;

}

//condition to check palindrome number

**if**(num == reverseNumber )

{

System.***out***.println("The Number is Palindrome !!");

}

**else**

{

System.***out***.println("The Number is not Palindrome !!");

}

}

}

**Lab Exercise No:** 9

**Exercise Objective(s):** *Loops*

**Exercise:** *Write a program to display the Fibonacci series starting from 0 till 200.*

**Recommended duration:** *20Mins*

**Solution Guidance (if applicable):** *NA*

**Solution:**

//Fibonacci series from 0 to 200

**public** **class** Fibonacci

{

**public** **static** **void** main(String[] args)

{

**int** num1=0; //default fibonacci number 1

**int** num2=1; //default fibonacci number 2

**int** num=0;

System.***out***.println("Fibonacci series from 0 to 200 ....");

//loop to generate fibonacci series till 200

**while**(num<=200)

{

System.***out***.println(num);

num1=num2;

num2=num;

num=num1+num2;

}

}

}

**Lab Exercise No:** 10

**Exercise Objective(s):** *Constants and literals, Loops*

**Exercise:** *Write a program to declare a set of 5 words and reverse each word and arrange the resulting words in alphabetical order and display the same.*

**Recommended duration:** *20Mins*

**Solution Guidance (if applicable):** *NA*

**Solution:**

**import** java.util.Scanner;

**import** java.util.Arrays;

**public** **class** ArrangeWords

{

**public** **static** **void** main(String[] args)

{

Scanner s = **new** Scanner(System.***in***);

String[] reverseWords = **new** String[5];

String[] words = **new** String[5];

System.***out***.println("Enter five words ==>");

**for**(**int** i=0;i<5;i++)

{

words[i]=s.nextLine();

}

*sortStrings*(words);

}

**public** **static** **void** sortStrings(String[] str)

{

String[] newStr = **new** String[5];

//reversing the strings

**for**(**int** i=0;i<str.length;i++)

{

**char** ch[]=str[i].toCharArray();

String rev="";

**for**(**int** j=ch.length-1;j>=0;j--)

{

rev+=ch[j];

}

newStr[i]=rev;

}

//Sorting the strings

**for**(**int** i=0;i<newStr.length;i++)

{

**for**(**int** j=i;j<newStr.length;j++)

{

**if**(newStr[i].compareTo(newStr[j])>0)

{

String temp = newStr[i];

newStr[i] = newStr[j];

newStr[j] = temp;

}

}

}

//strings after sorting them alphabetically

System.***out***.println("Strings in Sorted Order ==> ");

**for**(**int** i=0;i<newStr.length;i++)

{

System.***out***.println(newStr[i]);

}

}

}

**Lab Exercise No:** 11

**Exercise Objective(s):** *Constants and literals, Loops*

**Exercise:** *Write a program to arrange an array of elements in ascending order using selection sort*

*algorithm.*

**Recommended duration:** *20Mins*

**Solution Guidance (if applicable):** *NA*

**Solution:**

**import** java.util.Scanner;

**public** **class** SelectionSort

{

**public** **static** **void** main(String[] args)

{

Scanner s = **new** Scanner(System.***in***);

//accepting the array size

System.***out***.println("Enter the size of array ==> ");

**int** size=s.nextInt();

**int**[] arr = **new** **int**[size];

//accepting the array elements to be sorted

System.***out***.println("Enter the array elements ==> ");

**for**(**int** i=0;i<size;i++)

{

arr[i]=s.nextInt();

}

*selectionSort*(arr);

}

//function to sort array in ascending order using selection sort

**public** **static** **void** selectionSort(**int**[] numArray)

{

**for**(**int** i=0;i<numArray.length-1;i++)

{

//find minimum number in unsorted array

**int** min= i;

**for** (**int** j=i+1;j<numArray.length;j++)

{

**if** (numArray[j] < numArray[min])

{

min = j;

}

}

//swap the minimum number with the first number

**int** temp = numArray[min];

numArray[min] = numArray[i];

numArray[i] = temp;

}

//display the sorted list

System.***out***.println("Sorted Numbers are ....");

**for**(**int** i=0;i<numArray.length;i++)

{

System.***out***.println(numArray[i]);

}

}

}

**Lab Exercise No:** 12

**Exercise Objective(s):** *Conditional statements, Loops*

**Exercise:** *A shopkeeper sells three products whose retail prices are as follows:*

*Product 1 - 22.50 ,Product 2 - 44.50,Product 3 - 9.98*

*Write an application that reads a series of pairs of numbers as follows:*

*a) Product number b) Quantity sold*

*The application should use a switch statement to determine the retail price for each product. It should calculate and display the total retail value of all products sold.*

**Recommended duration:** *20Mins*

**Solution Guidance (if applicable):** *NA*

**Solution:**

**import** java.util.Scanner;

**public** **class** RetailPricing

{

**public** **static** **void** main(String[] args)

{

Scanner s = **new** Scanner(System.***in***);

//displaying the product no along with the price

System.***out***.println("Product No. | Prices");

System.***out***.println(" 1 | 22.50");

System.***out***.println(" 2 | 44.50");

System.***out***.println(" 3 | 9.98");

//select the product no. and the total quantity sold

System.***out***.println("Enter the Product No. and the quantity sold =");

**int** pno=s.nextInt();

**int** quantity=s.nextInt();

**double** price;

**switch**(pno)

{

**case** 1: //calculate the total retail value for all sold product 1

price=22.50\*quantity;

System.***out***.println("Total retail value of Product 1 sold ==>"+price);

**break**;

**case** 2: //calculate the total retail value for all sold product 2

price=44.50\*quantity;

System.***out***.println("Total retail value of Product 2 sold ==>"+price);

**break**;

**case** 3: //calculate the total retail value for all sold product 3

price=9.98\*quantity;

System.***out***.println("Total retail value of Product 23sold ==>"+price);

**break**;

**default**: //display message if the product no. is not available in the list

System.***out***.println("Invalid Product No.");

}

}

}

**Lab Exercise No:** 13

**Exercise Objective(s):** *Simple operators, Conditional statements, Loops*

**Exercise:** *Consider user has N eggs. Then display the no of eggs in gross (144 eggs make one gross) and no of eggs in dozen (12 eggs make one dozen) and the no of eggs that is left out remaining.*

*The total no of eggs can be got as input through command line. The program should display how many gross, how many dozen, and how many left over eggs the user has.*

**Recommended duration:** *20Mins*

**Solution Guidance (if applicable):** *For example, if the input is 1342 eggs, then the program should respond with Your number of eggs is 9 gross, 3 dozen, and 10*

**Solution:**

**public** **class** EggsDistribution

{

**public** **static** **void** main(String[] args)

{

**int** numberOfEggs=Integer.*parseInt*(args[0]);

//calculating the number of eggs in gross

**int** grossEggs=numberOfEggs/144;

//eggs remained after calculating the number of eggs in gross

**int** grossEggsLeft=numberOfEggs%144;

//calculating the number of eggs in dozen

**int** dozenEggs=grossEggsLeft/12;

//eggs remained after calculating the number of eggs in dozen

**int** remainingEggs=grossEggsLeft%12;

System.***out***.println("Your number of eggs is "+grossEggs+" gross, "+ dozenEggs+" dozen, and "+remainingEggs);

}

}