**Session 2 Control Flow**

1. Write a program in Java to check if a number is even or odd
2. Write a program in Java to find out if a number is prime or not
3. Write a Java program to check if a number is palindrome or not
4. Write a program to find if a number is power of 2 in Java
5. Write a Java program to check if a number is Armstrong or not?
6. Write a program in Java to print Fibonacci series upto given number? Write both Iterative and Recursive version
7. While purchasing certain items, a discount of 10% is offered if the quantity purchased is more than 1000. If quantity and price per item are input through the keyboard, write a program to calculate the total expenses.
8. If his basic salary is less than Rs. 1500, then HRA=10% of basic salary and DA=25% of basic. If his salary is either equal to or above Rs. 1500, then HRA=Rs. 500 and DA=50% of basic. If the employee’s salary is input through the keyboard write a program to find his gross salary.
9. Write a program to find simple interest and compound interest.
10. The marks obtained by a student in 5 different subjects are input through the keyboard. The student gets a division as per the following rules:

**Percentage above or equal to 75 – Honors**

**Percentage above or equal to 60 – First Division**

**Percentage between 50 and 59 – Second Division**

**Percentage between 40 and 49 – Third Division**

**Percentage less than 40 – Fail**

Write a program to calculate the division obtained by the student.

1.

import java.util.Scanner;

public class EvenOdd {

public static void main(String[] args) {

Scanner reader = new Scanner(System.in);

System.out.print("Enter a number: ");

int num = reader.nextInt();

if(num % 2 == 0)

System.out.println(num + " is even");

else

System.out.println(num + " is odd");

}

}

2

public class Main {

public static void main(String[] args) {

int num = 29;

boolean flag = false;

for (int i = 2; i <= num / 2; ++i) {

// condition for nonprime number

if (num % i == 0) {

flag = true;

break;

}

}

if (!flag)

System.out.println(num + " is a prime number.");

else

System.out.println(num + " is not a prime number.");

}

}

3

class PalindromeExample{

 public static void main(String args[]){

  int r,sum=0,temp;

  int n=454;//It is the number variable to be checked for palindrome

  temp=n;

  while(n>0){

   r=n%10;  //getting remainder

   sum=(sum\*10)+r;

   n=n/10;

  }

  if(temp==sum)

   System.out.println("palindrome number ");

  else

   System.out.println("not palindrome");

}

}

4

// Java Program to find whether a

// no is power of two

class Test {

/\* Function to check if x is power of 2\*/

static boolean isPowerOfTwo(int n)

{

return (int)(Math.ceil((Math.log(n) / Math.log(2))))

== (int)(Math.floor(((Math.log(n) / Math.log(2)))));

}

// Driver Code

public static void main(String[] args)

{

if (isPowerOfTwo(31))

System.out.println("Yes");

else

System.out.println("No");

if (isPowerOfTwo(64))

System.out.println("Yes");

else

System.out.println("No");

}

}

5

import java.util.Scanner;

import java.lang.Math;

public class ArmstsrongNumberExample

{

//function to check if the number is Armstrong or not

static boolean isArmstrong(int n)

{

int temp, digits=0, last=0, sum=0;

//assigning n into a temp variable

temp=n;

//loop execute until the condition becomes false

while(temp>0)

{

temp = temp/10;

digits++;

}

temp = n;

while(temp>0)

{

//determines the last digit from the number

last = temp % 10;

//calculates the power of a number up to digit times and add the resultant to the sum variable

sum +=  (Math.pow(last, digits));

//removes the last digit

temp = temp/10;

}

//compares the sum with n

if(n==sum)

//returns if sum and n are equal

return true;

//returns false if sum and n are not equal

else return false;

}

//driver code

public static void main(String args[])

{

int num;

Scanner sc= new Scanner(System.in);

System.out.print("Enter the limit: ");

//reads the limit from the user

num=sc.nextInt();

System.out.println("Armstrong Number up to "+ num + " are: ");

for(int i=0; i<=num; i++)

//function calling

if(isArmstrong(i))

//prints the armstrong numbers

System.out.print(i+ ", ");

}

}

6

public class FibonacciExample {

public static void main(String[] args)

{

// Set it to the number of elements you want in the Fibonacci Series

int maxNumber = 10;

int previousNumber = 0;

int nextNumber = 1;

System.out.print("Fibonacci Series of "+maxNumber+" numbers:");

for (int i = 1; i <= maxNumber; ++i)

{

System.out.print(previousNumber+" ");

/\* On each iteration, we are assigning second number

\* to the first number and assigning the sum of last two

\* numbers to the second number

\*/

int sum = previousNumber + nextNumber;

previousNumber = nextNumber;

nextNumber = sum;

}

}

}

7.

import java.util.Scanner;

public class Program

{

public static void main( String[] args )

{

Scanner reader = new Scanner(System.in);

int qty, dis = 0;

float rate, expense;

System.out.print("\nEnter Quantity: ");

qty = reader.nextInt();

System.out.print("Enter Rate: ");

rate = reader.nextFloat();

if (qty>1000)

dis = 10;

expense= (qty\*rate) - (qty\*rate\*dis / 100);

System.out.print("\nTotal Expenses = Rs." + expense);

}

}

8

import java.util.Scanner;

public class salary {

public static void main(String[] args)

{

int sal,hra,da,gs;

System.out.println("input salary of employee");

Scanner ob= new Scanner(System.in);

sal=ob.nextInt();

if(sal<1500)

{

hra=(1500/10);

da=(1500/25);

gs=hra+da+sal;

System.out.println("HRA ="+hra+"DA ="+ da + "Gross Salary =" + gs);

} else

{

hra=(sal+500);

da=(1500/50);

gs=hra+da+sal;

System.out.println("HRA ="+hra+"DA ="+ da + "Gross Salary =" + gs);

}

}

}

9

import java.util.Scanner;

class Main {

public static void main(String[] args) {

// create an object of Scanner class

Scanner input = new Scanner(System.in);

// take input from users

System.out.print("Enter the principal: ");

double principal = input.nextDouble();

System.out.print("Enter the rate: ");

double rate = input.nextDouble();

System.out.print("Enter the time: ");

double time = input.nextDouble();

System.out.print("Enter number of times interest is compounded: ");

int number = input.nextInt();

double interest = principal \* (Math.pow((1 + rate/100), (time \* number))) - principal;

System.out.println("Principal: " + principal);

System.out.println("Interest Rate: " + rate);

System.out.println("Time Duration: " + time);

System.out.println("Number of Time interest Compounded: " + number);

System.out.println("Compound Interest: " + interest);

input.close();

}

}

10

import java.util.Scanner;

public class JavaExample

{

public static void main(String args[])

{

int marks[] = new int[6];

int i;

float total=0, avg;

Scanner scanner = new Scanner(System.in);

for(i=0; i<6; i++) {

System.out.print("Enter Marks of Subject"+(i+1)+":");

marks[i] = scanner.nextInt();

total = total + marks[i];

}

scanner.close();

//Calculating average here

avg = total/6;

System.out.print("The student Grade is: ");

if(avg>=80)

{

System.out.print("A");

}

else if(avg>=60 && avg<80)

{

System.out.print("B");

}

else if(avg>=40 && avg<60)

{

System.out.print("C");

}

else

{

System.out.print("D");

}

}

}