**ASSIGNMENT**

Department: Computer Science And Engineering

Course code: CSE 123

Course title: Object Oriented Programming

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Submitted to:

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                           Section: B

USTC , Chittagong

**a. Convert Fahrenheit to Celsius**

**Code:**

import java.util.Scanner;

public class FahrenheitToCelsius {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Input a degree in Fahrenheit: ");

double fahrenheit = scanner.nextDouble();

double celsius = (fahrenheit - 32) \* 5 / 9;

System.out.println(fahrenheit + " degree Fahrenheit is equal to " + celsius + " in Celsius");

scanner.close();

}

}

**Explanation:**

We take input in Fahrenheit.

Convert it using the formula:

C = (F - 32) \times \frac{5}{9}

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**1. Leap Year Check**

**Code :**

import java.util.Scanner;

public class LeapYearCheck {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

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

int year = scanner.nextInt();

boolean isLeap = (year % 4 == 0 && year % 100 != 0) || (year % 400 == 0);

if (isLeap) {

System.out.println(year + " is a Leap Year.");

} else {

System.out.println(year + " is not a Leap Year.");

}

scanner.close();

}

}

**Explanation:**

A year is a leap year if:

It is divisible by 4.

If it is divisible by 100, it should also be divisible by 400.

We check these conditions and print the result.

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**2. Series: up to terms**

**Code:**

import java.util.Scanner;

public class SeriesOne {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter number of terms: ");

int n = scanner.nextInt();

int sum = 0;

for (int i = 1; i <= n \* 2; i += 2) {

sum += (i \* i);

}

System.out.println("Sum of series: " + sum);

scanner.close();

}

}

**Explanation:**

We iterate over the first odd numbers.

Square them and add to the sum.

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**3. Series: up to terms**

**Code:**

import java.util.Scanner;

public class AlternateSeries {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter number of terms: ");

int n = scanner.nextInt();

int sum = 0;

for (int i = 1; i <= n; i++) {

if (i % 2 == 0)

sum -= i;

else

sum += i;

}

System.out.println("Sum of series: " + sum);

scanner.close();

}

}

**Explanation:**

We alternate addition and subtraction based on whether is even or odd.

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**4. Factorial Calculation**

**Code:**

import java.util.Scanner;

public class Factorial {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

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

int n = scanner.nextInt();

long factorial = 1;

for (int i = 1; i <= n; i++) {

factorial \*= i;

}

System.out.println("Factorial of " + n + " is: " + factorial);

scanner.close();

}

}

**Explanation:**

Multiply numbers from to to get the factorial.

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**5. Power Calculation**

**Code:**

import java.util.Scanner;

public class PowerCalculation {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

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

int base = scanner.nextInt();

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

int exponent = scanner.nextInt();

long result = 1;

for (int i = 0; i < exponent; i++) {

result \*= base;

}

System.out.println(base + " raised to power " + exponent + " is: " + result);

scanner.close();

}

}

**Explanation:**

Multiply base by itself exponent times.

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**6. Bangla Season Finder**

**Code:**

import java.util.Scanner;

public class BanglaSeason {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter month number (1-12): ");

int month = scanner.nextInt();

switch (month) {

case 3, 4: System.out.println("Spring (Boshonto)"); break;

case 5, 6: System.out.println("Summer (Grishsho)"); break;

case 7, 8: System.out.println("Rainy (Borsha)"); break;

case 9, 10: System.out.println("Autumn (Shorot)"); break;

case 11, 12: System.out.println("Late Autumn (Hemonto)"); break;

case 1, 2: System.out.println("Winter (Sheet)"); break;

default: System.out.println("Invalid month.");

}

scanner.close();

}

}

**Explanation:**

We use a switch case to map months to Bangladeshi seasons.

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**7. Largest Number in an Array**

**Code:**

import java.util.Scanner;

public class LargestInArray {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter the number of elements: ");

int n = scanner.nextInt();

int[] arr = new int[n];

System.out.println("Enter " + n + " numbers:");

for (int i = 0; i < n; i++) {

arr[i] = scanner.nextInt();

}

int max = arr[0];

for (int num : arr) {

if (num > max) {

max = num;

}

}

System.out.println("Largest number: " + max);

scanner.close();

}

}

**Explanation:**

We iterate through the array and keep track of the largest number.

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**8. Sorting an Array in Ascending Order**

**Code:**

import java.util.Arrays;

import java.util.Scanner;

public class SortArray {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter the number of elements: ");

int n = scanner.nextInt();

int[] arr = new int[n];

System.out.println("Enter " + n + " numbers:");

for (int i = 0; i < n; i++) {

arr[i] = scanner.nextInt();

}

Arrays.sort(arr);

System.out.println("Sorted numbers in ascending order: " + Arrays.toString(arr));

scanner.close();

}

}

**Explanation:**

We take input in an array.

Use Arrays.sort() to sort the array.

Print the sorted array.

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