**Index no:- 30251**

**Practical no:- 05**

Section A

**Question 1**

// Using while loop

#include <stdio.h>

int main() {

int i = 0;

while (i <= 100) {

printf("%d\n", i);

i++;

}

return 0;

}

// Using do...while loop

#include <stdio.h>

int main() {

int i = 0;

do {

printf("%d\n", i);

i++;

} while (i <= 100);

return 0;

}

// Using for loop

#include <stdio.h>

int main() {

for (int i = 0; i <= 100; i++) {

printf("%d\n", i);

}

return 0;

}

**Question 2**

#include <stdio.h>

int main() {

int marks[10], total = 0, i;

for (i = 0; i < 10; i++) {

printf("Enter mark %d: ", i + 1);

scanf("%d", &marks[i]);

total += marks[i];

}

float average = total / 10.0;

if (average < 50) {

printf("Fail!");

} else {

printf("Pass!");

}

return 0;

}

**Question 3**

#include <stdio.h>

int main() {

int number;

int i = 1, factorial = 1;

printf("Enter number: ");

scanf("%d", &number);

while (i <= number) {

factorial \*= i;

i++;

}

printf("Factorial is %d\n", factorial);

return 0;

}

**Question 4**

// Calculate the sum of all digits of a user given number.

#include <stdio.h>

int sumOfDigits(int number) {

int sum = 0;

while (number > 0) {

sum += number % 10;

number /= 10;

}

return sum;

}

int main() {

int number;

printf("Enter a number: ");

scanf("%d", &number);

int sumOfDigitsOfNumber = sumOfDigits(number);

printf("The sum of digits of %d is %d\n", number, sumOfDigitsOfNumber);

return 0;

}

**Question 5**

// Reverse the digits of a number using do-while statement.

#include <stdio.h>

int reverse(int number) {

int reversedNumber = 0, remainder;

do {

remainder = number % 10;

reversedNumber = reversedNumber \* 10 + remainder;

number /= 10;

} while (number > 0);

return reversedNumber;

}

int main() {

int number;

printf("Enter a number: ");

scanf("%d", &number);

int reversedNumber = reverse(number);

printf("The reversed number is %d\n", reversedNumber);

return 0;

}

**Question 6**

#include <stdio.h>

int main() {

int base, exponent;

int result = 1;

printf("Enter base: ");

scanf("%d", &base);

printf("Enter exponent: ");

scanf("%d", &exponent);

// Calculate the nth power

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

result \*= base;

}

printf("Result: %d\n", result);

return 0;

}

**Question 7**

#include <stdio.h>

int main() {

int i, n;

int fib[10]; // Array to store Fibonacci numbers

// First two numbers of the Fibonacci sequence

fib[0] = 0;

fib[1] = 1;

// Generate Fibonacci sequence

for (i = 2; i < 10; i++) {

fib[i] = fib[i - 1] + fib[i - 2];

}

// Print the Fibonacci sequence

printf("First 10 numbers of the Fibonacci sequence:\n");

for (i = 0; i < 10; i++) {

printf("%d ", fib[i]);

}

return 0;

}

**Question 8**

#include <stdio.h>

#include <math.h>

int isArmstrongNumber(int number) {

int originalNumber, remainder, result = 0, n = 0;

originalNumber = number;

// Count the number of digits

while (originalNumber != 0) {

originalNumber /= 10;

++n;

}

originalNumber = number;

// Calculate the result

while (originalNumber != 0) {

remainder = originalNumber % 10;

result += pow(remainder, n);

originalNumber /= 10;

}

// Check if the number is an Armstrong number

if (result == number)

return 1; // It's an Armstrong number

else

return 0; // It's not an Armstrong number

}

int main() {

int number;

printf("Enter a number: ");

scanf("%d", &number);

if (isArmstrongNumber(number))

printf("%d is an Armstrong number.\n", number);

else

printf("%d is not an Armstrong number.\n", number);

return 0;

}

**Question 9**

#include <stdio.h>

int main() {

char letter;

printf("ASCII values for letters A to Z:\n");

for (letter = 'A'; letter <= 'Z'; letter++) {

printf("%c: %d\n", letter, letter);

}

return 0;

}

**Question 10**

#include <stdio.h>

int main()

{

printf(" \* \n");

printf(" \*\* \n");

printf(" \*\*\* \n");

printf(" \*\*\*\* \n");

printf(" \*\*\*\*\* \n");

return 0;

}

**Q11**

#include <stdio.h>

int isPrime(int number) {

int i;

// Corner cases: 0 and 1 are not prime

if (number <= 1)

return 0;

// Check for divisibility from 2 to sqrt(number)

for (i = 2; i \* i <= number; i++) {

if (number % i == 0)

return 0; // Number is divisible, not prime

}

return 1; // Number is prime

}

int main() {

int number;

printf("Enter a number: ");

scanf("%d", &number);

if (isPrime(number))

printf("%d is a prime number.\n", number);

else

printf("%d is not a prime number.\n", number);

return 0;

}

**Question 12**

#include <stdio.h>

void printFactors(int number) {

int i;

printf("Factors of %d: ", number);

// Iterate from 1 to number

for (i = 1; i <= number; i++) {

if (number % i == 0) {

printf("%d ", i);

}

}

printf("\n");

}

int main() {

int number;

printf("Enter an integer: ");

scanf("%d", &number);

printFactors(number);

return 0;

}

**Question 13**

#include <stdio.h>

int main() {

int number;

int sum = 0;

printf("Enter numbers (enter -1 to stop):\n");

while (1) {

scanf("%d", &number);

if (number == -1) {

break;

}

sum += number;

}

printf("Sum: %d\n", sum);

return 0;

}

**Question 14**

#include<stdio.h>

int main()

{

int i,arr[10];

//input

for (i=0;i<10;i++)

{

printf("enter a value to the element %d",i+i);

scanf("%d",&arr[i]);

}

//display

for (i=0;i<10;i++)

printf("%d",arr[i]);

}

**Question 15**

#include <stdio.h>

int main() {

int array[10];

int i, count = 0;

printf("Enter 10 integers:\n");

for (i = 0; i < 10; i++) {

scanf("%d", &array[i]);

if (array[i] % 2 == 0) {

count++;

}

}

printf("Count of even numbers: %d\n", count);

return 0;

}

Section B

**Question 01**

#include <stdio.h>

int main() {

int numbers[10];

int positiveCount = 0, negativeCount = 0, zeroCount = 0;

int i;

printf("Enter 10 numbers:\n");

for (i = 0; i < 10; i++) {

scanf("%d", &numbers[i]);

if (numbers[i] > 0) {

positiveCount++;

} else if (numbers[i] < 0) {

negativeCount++;

} else {

zeroCount++;

}

}

printf("Number of positive numbers: %d\n", positiveCount);

printf("Number of negative numbers: %d\n", negativeCount);

printf("Number of zeros: %d\n", zeroCount);

return 0;

}

**Question 02**

#include <stdio.h>

int main() {

int marks[10];

int i;

int maxMark, minMark, totalMarks = 0;

float averageMark;

printf("Enter marks of 10 students:\n");

for (i = 0; i < 10; i++) {

scanf("%d", &marks[i]);

totalMarks += marks[i];

if (i == 0) {

maxMark = marks[i];

minMark = marks[i];

} else {

if (marks[i] > maxMark) {

maxMark = marks[i];

}

if (marks[i] < minMark) {

minMark = marks[i];

}

}

}

averageMark = (float)totalMarks / 10;

printf("Maximum mark: %d\n", maxMark);

printf("Minimum mark: %d\n", minMark);

printf("Average mark: %.2f\n", averageMark);

return 0;

}

**Question 03**

#include <stdio.h>

int main() {

float prices[10];

int i;

float totalPrice = 0;

float averagePrice;

int countGreaterThan200 = 0;

printf("Enter prices of 10 items:\n");

for (i = 0; i < 10; i++) {

scanf("%f", &prices[i]);

totalPrice += prices[i];

if (prices[i] > 200) {

countGreaterThan200++;

}

}

averagePrice = totalPrice / 10;

printf("Average price of an item: %.2f\n", averagePrice);

printf("Number of items with price greater than 200: %d\n", countGreaterThan200);

return 0;

}

**Question 04**

#include <stdio.h>

int main() {

int employeeNo;

float basicSalary;

int count = 0;

printf("Enter the employee number and basic salary (enter -999 for employee number to stop):\n");

while (1) {

printf("Employee number: ");

scanf("%d", &employeeNo);

if (employeeNo == -999) {

break;

}

printf("Basic salary: ");

scanf("%f", &basicSalary);

if (basicSalary >= 5000) {

count++;

}

}

printf("Number of employees with a basic salary >= 5000: %d\n", count);

return 0;

}

**Question 05**

#include <stdio.h>

#define OVERTIME\_RATE\_NORMAL 150

#define OVERTIME\_RATE\_EXTRA 200

#define THRESHOLD\_PAYMENT 4000

int main() {

int employeeNo;

float hoursWorked;

float overtimePayment;

int countExceedingPayment = 0;

int totalEmployees = 0;

printf ("Enter the employee number and hours worked (enter -999 for employee number to stop):\n");

while (1) {

printf("Employee number: ");

scanf("%d", &employeeNo);

if (employeeNo == -999) {

break;

}

printf("Hours worked: ");

scanf("%f", &hoursWorked);

overtimePayment = 0;

if (hoursWorked > 40) {

float overtimeHours = hoursWorked - 40;

overtimePayment = (40 \* OVERTIME\_RATE\_NORMAL) + (overtimeHours \* OVERTIME\_RATE\_EXTRA);

} else {

overtimePayment = hoursWorked \* OVERTIME\_RATE\_NORMAL;

}

printf("Employee number: %d\n", employeeNo);

printf("Overtime payment: %.2f\n", overtimePayment);

if (overtimePayment > THRESHOLD\_PAYMENT) {

countExceedingPayment++;

}

totalEmployees++;

}

float percentageExceedingPayment = ((float)countExceedingPayment / totalEmployees) \* 100;

printf("Percentage of employees with overtime payment exceeding Rs. 4000: %.2f%%\n", percentageExceedingPayment);

return 0;

}