**Practical 03**

01.

int main()

{

int num1, num2;

printf("Enter two numbers: ");

scanf("%d %d", &num1, &num2);

if (num1 > num2)

{

printf("%d is the highest number.\n", num1);

}

else if (num2 > num1)

{

printf("%d is the highest number.\n", num2);

}

else

{

printf("Both numbers are equal.\n");

}

}

02.

int main()

{

int num1, num2, num3;

int largest, smallest;

printf("Enter three integer numbers: ");

scanf("%d %d %d", &num1, &num2, &num3);

largest = num1;

if (num2 > largest)

{

largest = num2;

}

if (num3 > largest)

{

largest = num3;

}

smallest = num1;

if (num2 < smallest)

{

smallest = num2;

}

if (num3 < smallest)

{

smallest = num3;

}

printf("The largest number is %d.\n", largest);

printf("The smallest number is %d.\n", smallest);

}

03.

int main() {

char name[50];

float basic\_salary, new\_salary, increment;

printf("Enter employee name: ");

scanf("%s", name);

printf("Enter basic salary: ");

scanf("%f", &basic\_salary);

if (basic\_salary < 5000) {

increment = basic\_salary \* 0.05;

} else if (basic\_salary >= 5000 && basic\_salary < 10000) {

increment = basic\_salary \* 0.1;

} else {

increment = basic\_salary \* 0.15;

}

new\_salary = basic\_salary + increment;

printf("Employee Name: %s\n", name);

printf("New Salary: %.2f\n", new\_salary);

}

04.

#define PI 3.14159

int main() {

float radius, diameter, circumference, area;

printf("Enter the radius of the circle: ");

scanf("%f", &radius);

diameter = 2 \* radius;

circumference = 2 \* PI \* radius;

area = PI \* radius \* radius;

printf("Diameter: %f\n", diameter);

printf("Circumference: %f\n", circumference);

printf("Area: %f\n", area);

}

05.

int main() {

int num1, num2;

printf("Enter two integers: ");

scanf("%d %d", &num1, &num2);

if (num2 != 0 && num1 % num2 == 0)

{

printf("%d is a multiple of %d\n", num1, num2);

}

else

{

printf("%d is not a multiple of %d\n", num1, num2);

}

}

06.

#include <stdio.h>

int main() {

char uppercase\_letters[] = {'A', 'B', 'C'};

char lowercase\_letters[] = {'a', 'b', 'c'};

char digits[] = {'0', '1', '2'};

char special\_symbols[] = {'$', '\*', '+', '/'};

char blank\_character = ' ';

printf("Integer equivalents of uppercase letters:\n");

for (int i = 0; i < sizeof(uppercase\_letters) / sizeof(uppercase\_letters[0]); i++) {

printf("%c: %d\n", uppercase\_letters[i], uppercase\_letters[i]);

}

printf("\nInteger equivalents of lowercase letters:\n");

for (int i = 0; i < sizeof(lowercase\_letters) / sizeof(lowercase\_letters[0]); i++) {

printf("%c: %d\n", lowercase\_letters[i], lowercase\_letters[i]);

}

printf("\nInteger equivalents of digits:\n");

for (int i = 0; i < sizeof(digits) / sizeof(digits[0]); i++) {

printf("%c: %d\n", digits[i], digits[i]);

}

printf("\nInteger equivalents of special symbols:\n");

for (int i = 0; i < sizeof(special\_symbols) / sizeof(special\_symbols[0]); i++) {

printf("%c: %d\n", special\_symbols[i], special\_symbols[i]);

}

printf("\nInteger equivalent of the blank character:\n");

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

return 0;

}

07.

int main() {

int years\_of\_service;

float basic\_salary, monthly\_sales, gross\_remuneration, bonus\_percentage;

printf("Enter the basic salary: ");

scanf("%f", &basic\_salary);

printf("Enter the number of years of service: ");

scanf("%d", &years\_of\_service);

printf("Enter the monthly sales: ");

scanf("%f", &monthly\_sales);

// Calculate additional allowance for years of service

float additional\_allowance = 0;

if (years\_of\_service > 5) {

additional\_allowance = 0.1 \* basic\_salary;

}

// Calculate additional allowance for working in Colombo

float colombo\_allowance = 0;

char city;

printf("Enter the city (C for Colombo): ");

scanf(" %c", &city);

if (city == 'C') {

colombo\_allowance = 2500;

}

// Calculate bonus percentage based on monthly sales

if (monthly\_sales < 25000) {

bonus\_percentage = 0.10;

} else if (monthly\_sales < 50000) {

bonus\_percentage = 0.12;

} else {

bonus\_percentage = 0.15;

}

// Calculate gross remuneration

gross\_remuneration = basic\_salary + additional\_allowance + colombo\_allowance + (monthly\_sales \* bonus\_percentage);

// Output the gross monthly remuneration

printf("Gross monthly remuneration: %.2f\n", gross\_remuneration);

}

**PRACTICAL 04**

01. #include <stdio.h>

int main() {

int number;

printf("Enter an integer: ");

scanf("%d", &number);

if (number % 2 == 0) {

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

} else {

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

}

return 0;

}

02. #include <stdio.h>

int main() {

int choice;

double num1, num2;

printf("Menu-Driven Calculator\n");

printf("1. Addition\n");

printf("2. Subtraction\n");

printf("3. Multiplication\n");

printf("4. Division\n");

printf("Enter your choice (1-4): ");

scanf("%d", &choice);

printf("Enter two numbers: ");

scanf("%lf %lf", &num1, &num2);

if (choice == 1) {

double sum = num1 + num2;

printf("Result: %.2lf\n", sum);

} else if (choice == 2) {

double difference = num1 - num2;

printf("Result: %.2lf\n", difference);

} else if (choice == 3) {

double product = num1 \* num2;

printf("Result: %.2lf\n", product);

} else if (choice == 4) {

if (num2 != 0) {

double quotient = num1 / num2;

printf("Result: %.2lf\n", quotient);

} else {

printf("Error: Division by zero is not allowed.\n");

}

} else {

printf("Invalid choice. Please select a number between 1 and 4.\n");

}

return 0;

}

03. #include <stdio.h>

#define PI 3.14159

int main() {

int choice;

float radius, result;

printf("Menu:\n");

printf("1. Calculate circumference of a circle\n");

printf("2. Calculate area of a circle\n");

printf("3. Calculate volume of a sphere\n");

printf("Enter your choice (1-3): ");

scanf("%d", &choice);

printf("Enter the radius: ");

scanf("%f", &radius);

if (choice == 1) {

result = 2 \* PI \* radius;

printf("The circumference of the circle is: %.2f\n", result);

}

else if (choice == 2) {

result = PI \* radius \* radius;

printf("The area of the circle is: %.2f\n", result);

}

else if (choice == 3) {

result = (4.0 / 3.0) \* PI \* radius \* radius \* radius;

printf("The volume of the sphere is: %.2f\n", result);

}

else {

printf("Invalid choice!\n");

}

return 0;

}

04. #include <stdio.h>

int main() {

char letter;

printf("Enter a character: ");

scanf("%c", &letter);

// Using switch statement

switch (letter) {

case 'a':

case 'e':

case 'i':

case 'o':

case 'u':

case 'A':

case 'E':

case 'I':

case 'O':

case 'U':

printf("The entered character is a vowel.\n");

break;

default:

printf("The entered character is not a vowel.\n");

break;

}

// Using if-else conditional structure

if (letter == 'a' || letter == 'e' || letter == 'i' || letter == 'o' || letter == 'u' ||

letter == 'A' || letter == 'E' || letter == 'I' || letter == 'O' || letter == 'U') {

printf("The entered character is a vowel.\n");

} else {

printf("The entered character is not a vowel.\n");

}

return 0;

}

05. #include <stdio.h>

int main() {

int month;

// Input month number from user

printf("Enter month number (1-12): ");

scanf("%d", &month);

// Check the month number using switch case

switch (month) {

case 1:

printf("January has 31 days.\n");

break;

case 2:

printf("February has 28 days.\n");

break;

case 3:

printf("March has 31 days.\n");

break;

case 4:

printf("April has 30 days.\n");

break;

case 5:

printf("May has 31 days.\n");

break;

case 6:

printf("June has 30 days.\n");

break;

case 7:

printf("July has 31 days.\n");

break;

case 8:

printf("August has 31 days.\n");

break;

case 9:

printf("September has 30 days.\n");

break;

case 10:

printf("October has 31 days.\n");

break;

case 11:

printf("November has 30 days.\n");

break;

case 12:

printf("December has 31 days.\n");

break;

default:

printf("Invalid month number. Please enter a number between 1 and 12.\n");

break;

}

return 0;

}

**PRACTICAL 05**

01.

Using a while loop

#include <stdio.h>

int main() {

int number = 0;

while (number <= 100) {

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

number++;

}

return 0;

}

Using a Do while loop

#include <stdio.h>

int main() {

int number = 0;

do {

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

number++;

} while (number <= 100);

return 0;

}

Using a fpr loop

#include <stdio.h>

int main() {

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

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

}

return 0;

}

02. #include <stdio.h>

int main() {

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

float average;

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

// Reading the marks

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

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

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

total += marks[i];

}

average = (float)total / 10; // Calculating the average

printf("Total marks: %d\n", total);

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

if (average < 50) {

printf("Fail!\n");

} else {

printf("Pass!\n");

}

return 0;

}

03. #include <stdio.h>

int main() {

int number, i;

unsigned long long factorial = 1;

printf("Enter a positive integer: ");

scanf("%d", &number);

if (number < 0) {

printf("Error: Factorial is not defined for negative numbers.\n");

} else {

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

factorial \*= i;

}

printf("Factorial of %d = %llu\n", number, factorial);

}

return 0;

}

04. #include <stdio.h>

int main() {

int number, digit, sum = 0;

printf("Enter a number: ");

scanf("%d", &number);

while (number > 0) {

digit = number % 10; // Get the last digit

sum += digit; // Add the digit to the sum

number /= 10; // Remove the last digit

}

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

return 0;

}

05. #include <stdio.h>

int main() {

int number, reversedNumber = 0, remainder;

printf("Enter a number: ");

scanf("%d", &number);

// Reversing the digits of the number

do {

remainder = number % 10; // Extracting the last digit

reversedNumber = reversedNumber \* 10 + remainder; // Building the reversed number

number /= 10; // Removing the last digit

} while (number != 0);

printf("Reversed number: %d\n", reversedNumber);

return 0;

}

06. #include <stdio.h>

int main() {

int base, exponent, result = 1;

printf("Enter the base: ");

scanf("%d", &base);

printf("Enter the exponent: ");

scanf("%d", &exponent);

// Calculating the power using a loop

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

result \*= base;

}

printf("%d raised to the power of %d is %d\n", base, exponent, result);

return 0;

}

07. #include <stdio.h>

int main() {

int n = 10; // Number of Fibonacci numbers to be printed

int first = 0, second = 1, next, i;

printf("Fibonacci Series: ");

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

if (i <= 1)

next = i;

else {

next = first + second;

first = second;

second = next;

}

printf("%d ", next);

}

return 0;

}

08. #include <stdio.h>

#include <math.h>

int isArmstrong(int number) {

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

// Store the original number in a separate variable

originalNumber = number;

// Count the number of digits

while (originalNumber != 0) {

originalNumber /= 10;

++n;

}

// Calculate the Armstrong number

originalNumber = number;

while (originalNumber != 0) {

remainder = originalNumber % 10;

result += pow(remainder, n);

originalNumber /= 10;

}

// Check if the number is Armstrong or not

if (result == number)

return 1; // Number is an Armstrong number

else

return 0; // Number is not an Armstrong number

}

int main() {

int number;

printf("Enter a number: ");

scanf("%d", &number);

if (isArmstrong(number))

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

else

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

return 0;

}

09. #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;

}

10. #include <stdio.h>

int main() {

int rows;

printf("Enter the number of rows: ");

scanf("%d", &rows);

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

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

printf("\*");

}

printf("\n");

}

return 0;

}

11. #include <stdio.h>

int isPrime(int number) {

if (number <= 1) {

return 0; // Not a prime number

}

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

if (number % i == 0) {

return 0; // Not a prime number

}

}

return 1; // Prime number

}

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;

}

12. #include <stdio.h>

void printFactors(int number) {

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

for (int 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;

}

12. #include <stdio.h>

int main() {

int number, sum = 0;

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

while (1) {

scanf("%d", &number);

if (number == -1)

break;

sum += number;

}

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

return 0;

}

13. #include <stdio.h>

int main() {

int array[10];

int i;

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

// Read user inputs for the array

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

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

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

}

// Print the array

printf("\nArray elements are: ");

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

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

}

return 0;

}

14. #include <stdio.h>

int countEvenNumbers(int arr[], int size) {

int count = 0;

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

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

count++;

}

}

return count;

}

int main() {

int arr[] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10};

int size = sizeof(arr) / sizeof(arr[0]);

int evenCount = countEvenNumbers(arr, size);

printf("The count of even numbers in the array is: %d\n", evenCount);

}

**SECTION B**

01.

#include <stdio.h>

int main() {

int numbers[10];

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

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

// Reading the numbers

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

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

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

}

// Counting positive, negative, and zero numbers

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

if (numbers[i] > 0)

positiveCount++;

else if (numbers[i] < 0)

negativeCount++;

else

zeroCount++;

}

// Outputting the results

printf("Positive numbers: %d\n", positiveCount);

printf("Negative numbers: %d\n", negativeCount);

printf("Zeroes: %d\n", zeroCount);

return 0;

}

02. #include <stdio.h>

int main() {

int marks[10];

int i, sum = 0;

int max = 0, min = 100;

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

// Read marks from the user

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

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

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

// Update maximum and minimum marks

if (marks[i] > max)

max = marks[i];

if (marks[i] < min)

min = marks[i];

// Calculate the sum of marks

sum += marks[i];

}

// Calculate the average marks

float average = (float)sum / 10;

printf("\nMaximum marks: %d\n", max);

printf("Minimum marks: %d\n", min);

printf("Average marks: %.2f\n", average);

return 0;

}

03. #include <stdio.h>

int main() {

int prices[10];

int sum = 0;

int count = 0;

// Input prices

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

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

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

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

sum += prices[i];

if (prices[i] > 200) {

count++;

}

}

// Calculate and display average

float average = (float) sum / 10;

printf("\nAverage value of an item: %.2f\n", average);

// Display count of items with price > 200

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

return 0;

}

04. #include <stdio.h>

int main() {

int employeeNo, count = 0;

float basicSalary;

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

while (1) {

scanf("%d", &employeeNo);

if (employeeNo == -999) {

break;

}

scanf("%f", &basicSalary);

if (basicSalary >= 5000) {

count++;

}

}

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

return 0;

}

05. #include <stdio.h>

int main() {

int employeeNumber[MAX\_EMPLOYEES];

int hoursWorked[MAX\_EMPLOYEES];

float overtimePayment[MAX\_EMPLOYEES];

int totalEmployees = 0;

int overtimeExceeding4000 = 0;

printf("Enter employee number (-999 to end): ");

scanf("%d", &employeeNumber[totalEmployees]);

while (employeeNumber[totalEmployees] != -999 && totalEmployees < MAX\_EMPLOYEES) {

printf("Enter hours worked for employee %d: ", employeeNumber[totalEmployees]);

scanf("%d", &hoursWorked[totalEmployees]);

// Calculate overtime payment

if (hoursWorked[totalEmployees] > 40) {

int overtimeHours = hoursWorked[totalEmployees] - 40;

int normalHours = hoursWorked[totalEmployees] - overtimeHours;

overtimePayment[totalEmployees] = (normalHours \* OVERTIME\_RATE) + (overtimeHours \* OVERTIME\_RATE\_EXTRA);

} else {

overtimePayment[totalEmployees] = 0;

}

if (overtimePayment[totalEmployees] > 4000) {

overtimeExceeding4000++;

}

totalEmployees++;

printf("Enter employee number (-999 to end): ");

scanf("%d", &employeeNumber[totalEmployees]);

}

printf("\nEmployee\tOvertime Payment\n");

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

printf("%d\t\t%.2f\n", employeeNumber[i], overtimePayment[i]);

}

float percentageExceeding4000 = (float) overtimeExceeding4000 / totalEmployees \* 100;

printf("\nPercentage of employees whose Overtime Payment exceeds Rs. 4000: %.2f%%\n", percentageExceeding4000);

return 0;

}