**Basic Logic Program**

1. DisplayThis Information using printf

a. Your Name

b. Your Birth date

c. Your Age

d. Your Address

#include<stadio.h>

main(){

printf(“Neha Vaghela”);

printf(“21/12/2003”);

printf(“21”);

printf(“33-ramesh nagar society ”);

}

2. Write a program to make Simple calculator (to make addition, subtraction,

multiplication, division and modulo)

#include <stdio.h>

main() {

char operator;

double num1, num2, result;

printf("Enter an operator (+, -, \*, /, %%): ");

scanf("%c", &operator);

printf("Enter two numbers: ");

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

switch (operator) {

case '+':

result = num1 + num2;

printf("%.2lf + %.2lf = %.2lf", num1, num2, result);

break;

case '-':

result = num1 - num2;

printf("%.2lf - %.2lf = %.2lf", num1, num2, result);

break;

case '\*':

result = num1 \* num2;

printf("%.2lf \* %.2lf = %.2lf", num1, num2, result);

break;

case '/':

if (num2 == 0) {

printf("Error: Division by zero\n");

} else {

result = num1 / num2;

printf("%.2lf / %.2lf = %.2lf", num1, num2, result);

}

break;

case '%':

if ((int)num1 != num1 || (int)num2 != num2) {

printf("Error: Modulo operation only works with integers\n");

} else {

result = (int)num1 % (int)num2;

printf("%d %% %d = %d", (int)num1, (int)num2, (int)result);

}

break;

default:

printf("Invalid operator\n");

}

}

3. WAP to Find Area And Circumference of Circle

#include <stdio.h>

#include <math.h>

#define PI 3.14159

main() {

float radius, area, circumference;

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

scanf("%f", &radius);

area = PI \* radius \* radius;

circumference = 2 \* PI \* radius;

printf("Area of the circle = %.2f square units\n", area);

printf("Circumference of the circle = %.2f units\n", circumference);

}

4. Find Area of Square formula : a = a2

#include <stdio.h>

main() {

float side, area;

printf("Enter the length of a side of the square: ");

scanf("%f", &side);

area = side \* side;

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

}

5. Find Area of Cube formula : a = 6a2

#include <stdio.h>

#include <math.h>

main() {

float side, surface\_area;

printf("Enter the length of a side of the cube: ");

scanf("%f", &side);

surface\_area = 6 \* pow(side, 2);

printf("The surface area of the cube is: %.2f square units\n", surface\_area);

}

6. Find area of Triangle Formula : A = 1/2 × b × h

#include <stdio.h>

main() {

float base, height, area;

printf("Enter the base of the triangle: ");

scanf("%f", &base);

printf("Enter the height of the triangle: ");

scanf("%f", &height);

area = (base \* height) / 2;

printf("The area of the triangle is: %.2f square units\n", area);

}

7. Find area of Rectangle Formula : A=wl

#include <stdio.h>

main() {

float length, width, area;

printf("Enter the length of the rectangle: ");

scanf("%f", &length);

printf("Enter the width of the rectangle: ");

scanf("%f", &width);

area = length \* width;

printf("The area of the rectangle is: %.2f square units\n", area);

}

8. Find circumference of Rectangle formula : C = 4 \* a

#include <stdio.h>

main() {

float side, perimeter;

printf("Enter the length of a side of the square: ");

scanf("%f", &side);

perimeter = 4 \* side;

printf("The perimeter of the square is: %.2f units\n", perimeter);

}

9. Find circumference of Triangle formula : triangle = a + b + c

#include <stdio.h>

main() {

float side1, side2, side3, perimeter;

printf("Enter the length of side 1: ");

scanf("%f", &side1);

printf("Enter the length of side 2: ");

scanf("%f", &side2);

printf("Enter the length of side 3: ");

scanf("%f", &side3);

perimeter = side1 + side2 + side3;

printf("The perimeter of the triangle is: %.2f units\n", perimeter);

}

10.find the area of a rectangular prism formula : A=2(wl+hl+hw)

#include <stdio.h>

main() {

float length, width, height, surface\_area;

printf("Enter the length of the rectangular prism: ");

scanf("%f", &length);

printf("Enter the width of the rectangular prism: ");

scanf("%f", &width);

printf("Enter the height of the rectangular prism: ");

scanf("%f", &height);

surface\_area = 2 \* (length \* width + length \* height + width \* height);

printf("The surface area of the rectangular prism is: %.2f square units\n", surface\_area);

}

11.Find circumference of square formula : C = 4 \* a

#include <stdio.h>

main() {

float side, perimeter;

printf("Enter the length of a side of the square: ");

scanf("%f", &side);

perimeter = 4 \* side;

printf("The perimeter of the square is: %.2f units\n", perimeter);

}

12.Accept number of students from user. I need to give 5 apples to each

student. How many apples are required?

#include <stdio.h>

main() {

int num\_students, total\_apples;

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

scanf("%d", &num\_students);

total\_apples = num\_students \* 5;

printf("Total number of apples required: %d\n", total\_apples);

}

13.Find character value from ascii

#include <stdio.h>

main() {

int ascii\_value;

char character;

printf("Enter the ASCII value: ");

scanf("%d", &ascii\_value);

// Convert the ASCII value to a character

character = (char)ascii\_value;

printf("The character for ASCII value %d is: %c\n", ascii\_value, character);

}

14.Find ascii value of given number

#include <stdio.h>

main() {

char character;

printf("Enter a character: ");

scanf("%c", &character);

int ascii\_value = character;

printf("The ASCII value of '%c' is: %d\n", character, ascii\_value);

}

15.Convert school’s name in abbreviated form

#include <stdio.h>

#include <string.h>

abbreviate(char \*school\_name) {

int i, len = strlen(school\_name);

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

// Print the first letter of each word as uppercase

if (i == 0 || school\_name[i - 1] == ' ') {

printf("%c.", toupper(school\_name[i]));

}

}

printf("\n");

}

main() {

char school\_name[100];

printf("Enter the school name: ");

fgets(school\_name, sizeof(school\_name), stdin);

abbreviate(school\_name);

}

16.Convert country’s name in abbreviate form

#include <stdio.h>

#include <string.h>

main() {

// Define arrays to store country names and their abbreviations

char countries[][50] = {

"United States", "Canada", "India", "Australia", "Germany",

"France", "Japan", "China", "Brazil", "Russia"

};

char codes[][3] = {

"US", "CA", "IN", "AU", "DE",

"FR", "JP", "CN", "BR", "RU"

};

char input[50];

// Ask the user to input the country name

printf("Enter the country name: ");

fgets(input, sizeof(input), stdin);

// Search for the country and print its abbreviation

int found = 0;

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

if (strcasecmp(input, countries[i]) == 0) {

printf("The abbreviation for %s is %s.\n", countries[i], codes[i]);

found = 1;

break;

}

}

if (!found) {

printf("Country not found in the list.\n");

}

}

17.Calculate person’s insurance premium based on salary

#include <stdio.h>

main() {

double salary, premium;

// Ask the user to input their salary

printf("Enter your annual salary: ");

scanf("%lf", &salary);

// Determine the premium based on salary

if (salary < 30000) {

premium = salary \* 0.05;

} else if (salary <= 60000) {

premium = salary \* 0.07;

} else {

premium = salary \* 0.10;

}

// Display the calculated premium

printf("Your insurance premium is: $%.2lf\n", premium);

}

18.Calculate person’s Annual salary

#include <stdio.h>

main() {

double monthlySalary, annualSalary;

printf("Enter your monthly salary: ");

scanf("%lf", &monthlySalary);

annualSalary = monthlySalary \* 12;

printf("Your annual salary is: $%.2lf\n", annualSalary);

}

19.Calculate compound interest

#include <stdio.h>

#include <math.h>

main() {

double principal, rate, time, amount, compoundInterest;

printf("Enter the principal amount: ");

scanf("%lf", &principal);

printf("Enter the annual interest rate (in %%): ");

scanf("%lf", &rate);

printf("Enter the time (in years): ");

scanf("%lf", &time);

amount = principal \* pow((1 + rate / 100), time);

compoundInterest = amount - principal;

printf("Compound Interest: $%.2lf\n", compoundInterest);

printf("Amount after %lf years: $%.2lf\n", time, amount);

}

20.Accept monthly salary from the user and deduct 10% insurance premium, 10% loan installment find out of remaining salary.

#include <stdio.h>

main() {

double monthlySalary, insurance, loan, remainingSalary;

printf("Enter your monthly salary: ");

scanf("%lf", &monthlySalary);

insurance = monthlySalary \* 0.10;

loan = monthlySalary \* 0.10;

remainingSalary = monthlySalary - insurance - loan;

printf("Remaining salary after deductions: $%.2lf\n", remainingSalary);

}

21.Accept 2 numbers from user and swap 2 numbers with using 3rd variable and without using 3rd variable

**(a) Using a Third Variable:**

#include <stdio.h>

main() {

int num1, num2, temp;

printf("Enter first number: ");

scanf("%d", &num1);

printf("Enter second number: ");

scanf("%d", &num2);

temp = num1;

num1 = num2;

num2 = temp;

printf("After swapping: num1 = %d, num2 = %d\n", num1, num2);

}

**(b) Without Using a Third Variable:**

#include <stdio.h>

main() {

int num1, num2;

printf("Enter first number: ");

scanf("%d", &num1);

printf("Enter second number: ");

scanf("%d", &num2);

num1 = num1 + num2;

num2 = num1 - num2;

num1 = num1 - num2;

printf("After swapping: num1 = %d, num2 = %d\n", num1, num2);

}

22.Calculate compound interest (Compound Interest formula:

a. Formula to calculate compound interest annually is given by:

Amount= P(1 + R/100)t

b. Compound Interest = Amount – P

#include <stdio.h>

#include <math.h>

main() {

double principal, rate, time, amount, compoundInterest;

printf("Enter the principal amount: ");

scanf("%lf", &principal);

printf("Enter the annual interest rate (in %%): ");

scanf("%lf", &rate);

printf("Enter the time (in years): ");

scanf("%lf", &time);

amount = principal \* pow((1 + rate / 100), time);

compoundInterest = amount - principal;

printf("Compound Interest: $%.2lf\n", compoundInterest);

printf("Amount after %lf years: $%.2lf\n", time, amount);

}

23.WAP to calculate swap 2 numbers with using of multiplication and division.

#include <stdio.h>

main() {

int num1, num2;

printf("Enter first number: ");

scanf("%d", &num1);

printf("Enter second number: ");

scanf("%d", &num2);

num1 = num1 \* num2;

num2 = num1 / num2;

num1 = num1 / num2;

printf("After swapping: num1 = %d, num2 = %d\n", num1, num2);

}

24.Accept 5 employees name and salary and count average and total salary

#include <stdio.h>

main() {

char names[5][50];

double salaries[5];

double totalSalary = 0, averageSalary;

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

printf("Enter name of employee %d: ", i + 1);

scanf("%s", names[i]);

printf("Enter salary of %s: ", names[i]);

scanf("%lf", &salaries[i]);

totalSalary += salaries[i];

}

averageSalary = totalSalary / 5;

printf("Total Salary: $%.2lf\n", totalSalary);

printf("Average Salary: $%.2lf\n", averageSalary);

}

25.Accept 5 expense from user and find average of expense

#include <stdio.h>

main() {

float expenses[5]; // Array to store the expenses

float sum = 0.0; // Variable to store the sum of expenses

float average; // Variable to store the average of expenses

int i;

// Input 5 expenses from the user

printf("Enter 5 expenses:\n");

for (i = 0; i < 5; i++) {

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

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

sum += expenses[i]; // Add each expense to the sum

}

// Calculate the average

average = sum / 5;

// Output the average

printf("The average expense is: %.2f\n", average);

}

26.Convert temperature Fahrenheit to Celsius

#include <stdio.h>

main() {

double fahrenheit, celsius;

printf("Enter temperature in Fahrenheit: ");

scanf("%lf", &fahrenheit);

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

printf("Temperature in Celsius: %.2lf°C\n", celsius);

}

27.Convert days into months

#include <stdio.h>

main() {

int days, months, remainingDays;

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

scanf("%d", &days);

months = days / 30; // Approximation: 1 month = 30 days

remainingDays = days % 30;

printf("%d days is approximately %d months and %d days.\n", days, months, remainingDays);

}

28.Convert years into days and months

#include <stdio.h>

main() {

int years, months, days;

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

scanf("%d", &years);

days = years \* 365; // Approximation: 1 year = 365 days

months = years \* 12;

printf("%d years is approximately %d days or %d months.\n", years, days, months);

}

29.Convert minutes into seconds and hours

#include <stdio.h>

main() {

int minutes, seconds, hours;

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

scanf("%d", &minutes);

seconds = minutes \* 60;

hours = minutes / 60;

printf("%d minutes is equal to %d seconds or %d hours and %d minutes.\n", minutes, seconds, hours, minutes % 60);

}

30.WAP to convert years into days and days into years

**(a) Convert Years into Days:**

#include <stdio.h>

main() {

int years, days;

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

scanf("%d", &years);

days = years \* 365; // Approximation: 1 year = 365 days

printf("%d years is approximately %d days.\n", years, days);

}

**(b) Convert Days into Years:**

#include <stdio.h>

main() {

int days, years, remainingDays;

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

scanf("%d", &days);

years = days / 365;

remainingDays = days % 365;

printf("%d days is approximately %d years and %d days.\n", days, years, remainingDays);

}

31.Convert kilometers into meters

#include <stdio.h>

main() {

double kilometers, meters;

printf("Enter the distance in kilometers: ");

scanf("%lf", &kilometers);

meters = kilometers \* 1000;

printf("%.2lf kilometers is equal to %.2lf meters.\n", kilometers, meters);

}

32.Accept 2 numbers and find out its sum check it size

#include <stdio.h>

main() {

int num1, num2, sum;

printf("Enter first number: ");

scanf("%d", &num1);

printf("Enter second number: ");

scanf("%d", &num2);

sum = num1 + num2;

printf("The sum of %d and %d is %d.\n", num1, num2, sum);

if (sum > 0) {

printf("The sum is positive.\n");

} else if (sum < 0) {

printf("The sum is negative.\n");

} else {

printf("The sum is zero.\n");

}

}

33.C Program to Read Integer and Print First Three Powers (N^1, N^2, N^3)

#include <stdio.h>

main() {

int number, power1, power2, power3;

printf("Enter an integer: ");

scanf("%d", &number);

power1 = number;

power2 = number \* number;

power3 = number \* number \* number;

printf("%d^1 = %d\n", number, power1);

printf("%d^2 = %d\n", number, power2);

printf("%d^3 = %d\n", number, power3);

}

**Conditional Logic Programs:**

1. Write a C program to accept two integers and check whether they are equal or not

#include <stdio.h>

main() {

int num1, num2;

printf("Enter two integers: ");

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

if (num1 == num2) {

printf("%d and %d are equal.\n", num1, num2);

} else {

printf("%d and %d are not equal.\n", num1, num2);

}

}

2. Write a C program to read the value of an integer m and display the value of m is 1 when m is larger than 0, 0 when m is 0 and -1 when m is less than 0

#include <stdio.h>

main() {

int m;

printf("Enter an integer: ");

scanf("%d", &m);

if (m > 0) {

printf("m is 1\n");

} else if (m == 0) {

printf("m is 0\n");

} else {

printf("m is -1\n");

}

}

3. WAP to check if the given year is a leap year or not.

#include <stdio.h>

main() {

int year;

// Asking for user input

printf("Enter a year: ");

scanf("%d", &year);

// Checking if the year is a leap year

if (year % 4 == 0) {

if (year % 100 == 0) {

if (year % 400 == 0) {

printf("%d is a leap year.\n", year);

} else {

printf("%d is not a leap year.\n", year);

}

} else {

printf("%d is a leap year.\n", year);

}

} else {

printf("%d is not a leap year.\n", year);

}

}

4. WAP to make simple calculator (operation include Addition, Subtraction, Multiplication, Division, modulo) using conditional statement

#include <stdio.h>

main() {

char operator;

double num1, num2, result;

printf("Enter an operator (+, -, \*, /, %%): ");

scanf("%c", &operator);

printf("Enter two numbers: ");

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

switch (operator) {

case '+':

result = num1 + num2;

printf("%.2lf + %.2lf = %.2lf\n", num1, num2, result);

break;

case '-':

result = num1 - num2;

printf("%.2lf - %.2lf = %.2lf\n", num1, num2, result);

break;

case '\*':

result = num1 \* num2;

printf("%.2lf \* %.2lf = %.2lf\n", num1, num2, result);

break;

case '/':

if (num2 == 0) {

printf("Error: Division by zero\n");

} else {

result = num1 / num2;

printf("%.2lf / %.2lf = %.2lf\n", num1, num2, result);

}

break;

case '%':

if ((int)num1 != num1 || (int)num2 != num2) {

printf("Error: Modulo operation is only valid for integers\n");

} else {

result = (int)num1 % (int)num2;

printf("%d %% %d = %d\n", (int)num1, (int)num2, (int)result);

}

break;

default:

printf("Invalid operator\n");

}

}

5. Check Number Is Positive or Negative

#include <stdio.h>

main() {

int num;

printf("Enter a number: ");

scanf("%d", &num);

if (num > 0) {

printf("%d is positive.\n", num);

} else if (num < 0) {

printf("%d is negative.\n", num);

} else {

printf("%d is zero.\n", num);

}

}

6. Find the Character Is Vowel or Not

#include <stdio.h>

main() {

char ch;

printf("Enter a character: ");

scanf("%c", &ch);

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

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

printf("%c is a vowel\n", ch);

} else {

printf("%c is a consonant\n", ch);

}

}

7. Accept marks from user and check pass or fail

#include <stdio.h>

main() {

int marks;

printf("Enter your marks (out of 100): ");

scanf("%d", &marks);

if (marks >= 33) {

printf("Pass\n");

} else {

printf("Fail\n");

}

}

8. WAP to accept the height of a person in centimeters and categorize the person according to their height.

#include <stdio.h>

main() {

float height;

printf("Enter the height of the person (in centimeters): ");

scanf("%f", &height);

if (height < 150.0) {

printf("The person is short.\n");

} else if (height >= 150.0 && height <= 165.0) {

printf("The person is of average height.\n");

} else if (height > 165.0 && height <= 195.0) {

printf("The person is tall.\n");

} else {

printf("The person's height is unusual.\n");

}

}

9. C Program to Check Uppercase or Lowercase or Digit or Special Character Topics Covered Control statements Conditional Statements

#include <stdio.h>

main() {

char ch;

printf("Enter a character: ");

scanf("%c", &ch);

if (isupper(ch)) {

printf("%c is an uppercase letter.\n", ch);

} else if (islower(ch)) {

printf("%c is a lowercase letter.\n", ch);

} else if (isdigit(ch)) {

printf("%c is a digit.\n", ch);

} else {

printf("%c is a special character.\n", ch);

}

}

10.WAP to check whether a number is negative, positive or zero

#include <stdio.h>

main() {

int num;

printf("Enter a number: ");

scanf("%d", &num);

if (num > 0) {

printf("%d is positive.\n", num);

} else if (num < 0) {

printf("%d is negative.\n", num);

} else {

printf("%d is zero.\n", num);

}

}

11.WAP to find number is even or odd using ternary operator

#include <stdio.h>

main() {

int num;

printf("Enter a number: ");

scanf("%d", &num);

(num % 2 == 0) ? printf("%d is even.\n", num) : printf("%d is odd.\n", num);

}

12.WAP to find maximum number among 3 numbers using ternary operator

#include <stdio.h>

main() {

int num1, num2, num3, max;

printf("Enter three numbers: ");

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

max = (num1 > num2) ? ((num1 > num3) ? num1 : num3) : ((num2 > num3) ? num2 : num3);

printf("The maximum number is: %d\n", max);

}

13.WAP to find minimum number among 3 numbers using ternary operator

#include <stdio.h>

main() {

int num1, num2, num3, min;

printf("Enter three numbers: ");

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

min = (num1 < num2) ? ((num1 < num3) ? num1 : num3) : ((num2 < num3) ? num2 : num3);

printf("The minimum number is: %d\n", min);

}

14.WAP to find the largest of three numbers.

#include <stdio.h>

main() {

int num1, num2, num3, largest;

printf("Enter three numbers: ");

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

// Using nested if-else to find the largest

if (num1 >= num2 && num1 >= num3) {

largest = num1;

} else if (num2 >= num1 && num2 >= num3) {

largest = num2;

} else {

largest = num3;

}

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

}

15. Write a C program to determine eligibility for admission to a professionalcourse based on the following criteria Eligibility Criteria : Marks in Maths >=65 and Marks in Phy >=55 and Marks in Chem>=50 and Total in all three subject >=190 or Total in Maths and Physics >=140 --------------------------------------Input the marks obtained in Physics :65 Input the marks obtained in Chemistry :51 Input the marks Obtain ned in Mathematics :72 Total marks of Maths, Physics and Chemistry : 188 Total marks of Maths and Physics : 137 The candidate is not eligible.

#include <stdio.h>

main() {

int maths, physics, chemistry, total, mp\_total;

printf("Input the marks obtained in Mathematics: ");

scanf("%d", &maths);

printf("Input the marks obtained in Physics: ");

scanf("%d", &physics);

printf("Input the marks obtained in Chemistry: ");

scanf("%d", &chemistry);

total = maths + physics + chemistry;

mp\_total = maths + physics;

if ((maths >= 65 && physics >= 55 && chemistry >= 50 && total >= 190) || mp\_total >= 140) {

printf("The candidate is eligible.\n");

} else {

printf("The candidate is not eligible.\n");

}

}

16. Write a C program to read temperature in centigrade and display a suitable

message according to the temperature state below:

Temp < 0 then Freezing weather

Temp 0-10 then Very Cold weather

Temp 10-20 then Cold weather

Temp 20-30 then Normal in Temp

Temp 30-40 then Its Hot

Temp >=40 then Its Very Hot

#include <stdio.h>

main() {

float temp;

printf("Input temperature in centigrade: ");

scanf("%f", &temp);

if (temp < 0)

printf("Freezing weather\n");

else if (temp >= 0 && temp < 10)

printf("Very Cold weather\n");

else if (temp >= 10 && temp < 20)

printf("Cold weather\n");

else if (temp >= 20 && temp < 30)

printf("Normal in Temp\n");

else if (temp >= 30 && temp < 40)

printf("It's Hot\n");

else

printf("It's Very Hot\n");

}

17. Write a C program to check whether a triangle can be formed with the given values for the angles.

#include <stdio.h>

main() {

int angle1, angle2, angle3;

printf("Input three angles of the triangle: ");

scanf("%d %d %d", &angle1, &angle2, &angle3);

if (angle1 + angle2 + angle3 == 180)

printf("The triangle is valid.\n");

else

printf("The triangle is not valid.\n");

}

18. Write a C program to calculate profit and loss on a transaction.

#include <stdio.h>

main() {

float cost\_price, selling\_price, profit\_loss;

printf("Input cost price: ");

scanf("%f", &cost\_price);

printf("Input selling price: ");

scanf("%f", &selling\_price);

profit\_loss = selling\_price - cost\_price;

if (profit\_loss > 0)

printf("You made a profit of %.2f\n", profit\_loss);

else if (profit\_loss < 0)

printf("You incurred a loss of %.2f\n", -profit\_loss);

else

printf("No profit, no loss.\n");

}

19. Write a program in C to calculate and print the electricity bill of a given customer. The customer ID, name, and unit consumed by the user should be captured from the keyboard to display the total amount to be paid to the customer. The charge are as follow :

Unit Charge/unit

upto 350 @1.20

350 and above but less than 600 @1.50

600 and above but less than 800 @1.80

800 and above @2.00

If bill exceeds Rs. 800 then a surcharge of 18% will be charged and

the minimum bill should be of Rs. 256/-

#include <stdio.h>

main() {

int customer\_id, units;

char name[25];

float charge, surcharge = 0, total\_amount;

printf("Input Customer ID: ");

scanf("%d", &customer\_id);

printf("Input Customer Name: ");

scanf("%s", name);

printf("Input Units Consumed: ");

scanf("%d", &units);

if (units <= 350)

charge = units \* 1.20;

else if (units < 600)

charge = units \* 1.50;

else if (units < 800)

charge = units \* 1.80;

else

charge = units \* 2.00;

if (charge > 800)

surcharge = 0.18 \* charge;

total\_amount = charge + surcharge;

if (total\_amount < 256)

total\_amount = 256;

printf("Customer ID: %d\n", customer\_id);

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

printf("Units Consumed: %d\n", units);

printf("Total Amount to be Paid: %.2f\n", total\_amount);

}

20. Write a program in C to read any Month Number in integer and display the number of days for this month.

#include <stdio.h>

main() {

int month;

printf("Input Month Number: ");

scanf("%d", &month);

if (month == 2)

printf("28/29 days\n");

else if (month == 4 || month == 6 || month == 9 || month == 11)

printf("30 days\n");

else if (month == 1 || month == 3 || month == 5 || month == 7 || month == 8 || month == 10 || month == 12)

printf("31 days\n");

else

printf("Invalid month number\n");

}

21.Write a C program to input basic salary of an employee and calculateits

Gross salary according to following:

Basic Salary <= 10000 : HRA = 20%, DA = 80%

Basic Salary <= 20000 : HRA = 25%, DA = 90%

Basic Salary > 20000 : HRA = 30%, DA = 95%\

#include <stdio.h>

main() {

float basic\_salary, hra, da, gross\_salary;

printf("Input Basic Salary: ");

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

if (basic\_salary <= 10000) {

hra = 0.20 \* basic\_salary;

da = 0.80 \* basic\_salary;

} else if (basic\_salary <= 20000) {

hra = 0.25 \* basic\_salary;

da = 0.90 \* basic\_salary;

} else {

hra = 0.30 \* basic\_salary;

da = 0.95 \* basic\_salary;

}

gross\_salary = basic\_salary + hra + da;

printf("Gross Salary: %.2f\n", gross\_salary);

}

22. WAP to input the week number and print week day.

#include <stdio.h>

main() {

int week\_number;

printf("Input Week Number (1-7): ");

scanf("%d", &week\_number);

switch (week\_number) {

case 1: printf("Monday\n"); break;

case 2: printf("Tuesday\n"); break;

case 3: printf("Wednesday\n"); break;

case 4: printf("Thursday\n"); break;

case 5: printf("Friday\n"); break;

case 6: printf("Saturday\n"); break;

case 7: printf("Sunday\n"); break;

default: printf("Invalid week number\n");

}

}

23. Accept month number and display month name

#include <stdio.h>

main() {

int month\_number;

printf("Input Month Number (1-12): ");

scanf("%d", &month\_number);

switch (month\_number) {

case 1: printf("January\n"); break;

case 2: printf("February\n"); break;

case 3: printf("March\n"); break;

case 4: printf("April\n"); break;

case 5: printf("May\n"); break;

case 6: printf("June\n"); break;

case 7: printf("July\n"); break;

case 8: printf("August\n"); break;

case 9: printf("September\n"); break;

case 10: printf("October\n"); break;

case 11: printf("November\n"); break;

case 12: printf("December\n"); break;

default: printf("Invalid month number\n");

}

}

24.Accept the input month number and print number of days in that

month. (Similar to Question 20)

25.Write a C program to input electricity unit charges and calculate total

electricity bill according to the given condition:

For first 50 units Rs. 0.50/unit

For next 100 units Rs. 0.75/unit

For next 100 units Rs. 1.20/unit

For unit above 250 Rs. 1.50/unit

An additional surcharge of 20% is added to the bill

#include <stdio.h>

main() {

int units;

float bill, surcharge, total\_bill;

printf("Input electricity units consumed: ");

scanf("%d", &units);

if (units <= 50)

bill = units \* 0.50;

else if (units <= 150)

bill = 50 \* 0.50 + (units - 50) \* 0.75;

else if (units <= 250)

bill = 50 \* 0.50 + 100 \* 0.75 + (units - 150) \* 1.20;

else

bill = 50 \* 0.50 + 100 \* 0.75 + 100 \* 1.20 + (units - 250) \* 1.50;

surcharge = 0.20 \* bill;

total\_bill = bill + surcharge;

printf("Total Electricity Bill: %.2f\n", total\_bill);

}

26.WAP to show

i. Monday to Sunday using switch case

#include <stdio.h>

main() {

int day;

printf("Input day number (1-7): ");

scanf("%d", &day);

switch(day) {

case 1: printf("Monday\n"); break;

case 2: printf("Tuesday\n"); break;

case 3: printf("Wednesday\n"); break;

case 4: printf("Thursday\n"); break;

case 5: printf("Friday\n"); break;

case 6: printf("Saturday\n"); break;

case 7: printf("Sunday\n"); break;

default: printf("Invalid input\n");

}

}

ii. Vowel or Consonant using switch case

#include <stdio.h>

main() {

char ch;

printf("Input a letter: ");

scanf(" %c", &ch);

switch(ch) {

case 'a':

**Looping Statements Conditional Statements**

1. WAP to print 972 to 897 using for loop

#include <stdio.h>

main() {

for (int i = 972; i >= 897; i--) {

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

}

}

2. WAP to accept 5 numbers from user and display all numbers

#include <stdio.h>

main() {

int numbers[5];

printf("Enter 5 numbers:\n");

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

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

}

printf("The numbers are:\n");

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

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

}

printf("\n");

}

3. WAP to take 10 no. Input from user find out below values

a. How many Even numbers are there

b. How many odd numbers are there

c. Sum of even numbers

d. Sum of odd numbers

#include <stdio.h>

main() {

int numbers[10];

int even\_count = 0, odd\_count = 0;

int even\_sum = 0, odd\_sum = 0;

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

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

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

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

even\_count++;

even\_sum += numbers[i];

} else {

odd\_count++;

odd\_sum += numbers[i];

}

}

printf("Even numbers: %d\n", even\_count);

printf("Odd numbers: %d\n", odd\_count);

printf("Sum of even numbers: %d\n", even\_sum);

printf("Sum of odd numbers: %d\n", odd\_sum);

}

4. WAP to print table up to given numbers

Topics Covered

Looping Statements

Conditional Statements

#include <stdio.h>

main() {

int n;

printf("Enter a number to print its multiplication table: ");

scanf("%d", &n);

for (int i = 1; i <= 10; i++) {

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

}

}

5. WAP to print factorial of given number

#include <stdio.h>

main() {

int n;

unsigned long long factorial = 1;

printf("Enter a number to find its factorial: ");

scanf("%d", &n);

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

factorial \*= i;

}

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

}

6. WAP to print Fibonacci series up to given numbers

#include <stdio.h>

main() {

int n, t1 = 0, t2 = 1, nextTerm;

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

scanf("%d", &n);

printf("Fibonacci Series: ");

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

printf("%d, ", t1);

nextTerm = t1 + t2;

t1 = t2;

t2 = nextTerm;

}

}

7. WAP to print number in reverse order e.g.: number = 64728 ---> reverse = 82746

#include <stdio.h>

main() {

int n, reverse = 0;

printf("Enter a number: ");

scanf("%d", &n);

while (n != 0) {

reverse = reverse \* 10 + n % 10;

n /= 10;

}

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

}

8. Write a program to find out the max from given number (E.g., No: -1562 Max number is 6)

#include <stdio.h>

main() {

int n, max\_digit = 0, digit;

printf("Enter a number: ");

scanf("%d", &n);

while (n != 0) {

digit = n % 10;

if (digit > max\_digit) {

max\_digit = digit;

}

n /= 10;

}

printf("Maximum digit: %d\n", max\_digit);

}

9. Write a program make a summation of given number (E.g., 1523 Ans: -11)

#include <stdio.h>

main() {

int n, sum = 0, digit;

printf("Enter a number: ");

scanf("%d", &n);

while (n != 0) {

digit = n % 10;

sum += digit;

n /= 10;

}

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

}

10.Write a program you have to make a summation of first and last Digit. (E.g.,1234 Ans: -5)

#include <stdio.h>

main() {

int n, first\_digit, last\_digit;

printf("Enter a number: ");

scanf("%d", &n);

last\_digit = n % 10;

while (n >= 10) {

n /= 10;

}

first\_digit = n;

printf("Sum of first and last digit: %d\n", first\_digit + last\_digit);

}

11.Accept 5 names from user at run time.

#include <stdio.h>

main() {

char names[5][50];

printf("Enter 5 names:\n");

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

scanf("%s", names[i]);

}

printf("The names are:\n");

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

printf("%s\n", names[i]);

}

}

12.Program of Armstrong Number in C Using For Loop & While Loop

#include <stdio.h>

#include <math.h>

main() {

int num, originalNum, remainder, n = 0;

float result = 0.0;

printf("Enter an integer: ");

scanf("%d", &num);

originalNum = num;

for (originalNum = num; originalNum != 0; ++n) {

originalNum /= 10;

}

for (originalNum = num; originalNum != 0; originalNum /= 10) {

remainder = originalNum % 10;

result += pow(remainder, n);

}

if ((int)result == num) {

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

} else {

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

}

}

13.calculate the Factorial of a Given Number using while loop

#include <stdio.h>

main() {

int n;

unsigned long long factorial = 1;

printf("Enter a number to find its factorial: ");

scanf("%d", &n);

int i = 1;

while (i <= n) {

factorial \*= i;

i++;

}

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

}

14.Accept 5 numbers from user and find those numbers factorials

#include <stdio.h>

unsigned long long factorial(int n) {

unsigned long long fact = 1;

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

fact \*= i;

}

return fact;

}

main() {

int numbers[5];

printf("Enter 5 numbers:\n");

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

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

}

printf("Factorials of the numbers are:\n");

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

printf("Factorial of %d is %llu\n", numbers[i], factorial(numbers[i]));

}

}

15.Calculate sum of 10 numbers using of while loop

#include <stdio.h>

main() {

int sum = 0, num, count = 0;

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

while (count < 10) {

scanf("%d", &num);

sum += num;

count++;

}

printf("Sum of the 10 numbers is: %d\n", sum);

}

16.Calculate the Sum of Natural Numbers Using the While Loop

#include <stdio.h>

main() {

int n, sum = 0;

printf("Enter a positive integer: ");

scanf("%d", &n);

int i = 1;

while (i <= n) {

sum += i;

i++;

}

printf("Sum of natural numbers up to %d is: %d\n", n, sum);

}

17.Calculate 5 numbers from user and calculate number of even and odd using of while loop

#include <stdio.h>

main() {

int num, count = 0, even\_count = 0, odd\_count = 0;

while (count < 5) {

printf("Enter a number: ");

scanf("%d", &num);

if (num % 2 == 0) {

even\_count++;

} else {

odd\_count++;

}

count++;

}

printf("Number of even numbers: %d\n", even\_count);

printf("Number of odd numbers: %d\n", odd\_count);

}

18.Write a C Program to Print the Multiplication Table of N

i. E.g. 5 \* 1 = 5

ii. 5 \* 2 = 10

1. .

2. .

iii. 5 \* 10 = 50

#include <stdio.h>

main() {

int n;

printf("Enter a number to print its multiplication table: ");

scanf("%d", &n);

for (int i = 1; i <= 10; i++) {

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

}

}

19. Patterns:

1. Binary Pattern

1

10

101

1010

10101

#include <stdio.h>

main() {

int i, j;

for (i = 1; i <= 5; i++) {

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

printf("%d", j % 2);

}

printf("\n");

}

}

2. Alphabet Pattern

A

B C

D E F

G H I J

K L M N O

#include <stdio.h>

main() {

char ch = 'A';

int i, j;

for (i = 1; i <= 5; i++) {

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

printf("%c ", ch);

ch++;

}

printf("\n");

}

}

3. Right-angled Triangle Star Pattern

\*

\*\*\*

\*\*\*\*\*

\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*

#include <stdio.h>

main() {

int i, j, k;

for (i = 1; i <= 5; i++) {

for (j = 1; j <= 5 - i; j++) {

printf(" ");

}

for (k = 1; k <= 2 \* i - 1; k++) {

printf("\*");

}

printf("\n");

}

}

4. Right-aligned Star Pattern

\*\*\*\*\*

\*\*\*\*

\*\*\*

\*\*

\*

#include <stdio.h>

main() {

int i, j;

for (i = 5; i >= 1; i--) {

for (j = 1; j <= 5 - i; j++) {

printf(" ");

}

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

printf("\*");

}

printf("\n");

}

}

5. Number Pyramid Pattern

1

2 3

4 5 6

7 8 9 10

11 12 13 14 15

#include <stdio.h>

main() {

int i, j, num = 1;

for (i = 1; i <= 5; i++) {

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

printf("%d ", num);

num++;

}

printf("\n");

}

}

6. Alphabet Pyramid Pattern

A

A B

A B C

A B C D

A B C D E

#include <stdio.h>

main() {

int i, j;

for (i = 1; i <= 5; i++) {

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

printf("%c ", 'A' + j - 1);

}

printf("\n");

}

}

20. WAP program to print below output using for loop

**Print output pattern using for loop**

01 02

11 12

21 22

31 32

...

41 42

#include <stdio.h>

main() {

int i, j;

for (i = 0; i < 5; i++) {

for (j = 1; j <= 2; j++) {

printf("%d%d ", i + 1, j);

}

printf("\n");

}

}

21. Accept 3 numbers from user using while loop and check each number's palindrome

#include <stdio.h>

int isPalindrome(int num) {

int reversed = 0, original = num, remainder;

while (num != 0) {

remainder = num % 10;

reversed = reversed \* 10 + remainder;

num /= 10;

}

return original == reversed;

}

main() {

int num, count = 0;

while (count < 3) {

printf("Enter a number: ");

scanf("%d", &num);

if (isPalindrome(num)) {

printf("%d is a palindrome\n", num);

} else {

printf("%d is not a palindrome\n", num);

}

count++;

}

}

22. Accept 3 numbers from user using while loop and check each numbers Palindrome

#include <stdio.h>

main() {

int num, reversed = 0;

printf("Enter a number: ");

scanf("%d", &num);

for (; num != 0; num /= 10) {

reversed = reversed \* 10 + num % 10;

}

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

}

23. C Program to Reverse a Number Using FOR Loop Series Program:

#include <stdio.h>

main() {

int num, reversed = 0;

printf("Enter a number: ");

scanf("%d", &num);

for (; num != 0; num /= 10) {

reversed = reversed \* 10 + num % 10;

}

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

}

24. 1 + 2 + 3 + 4 + 5 + ... + n

#include <stdio.h>

main() {

int n, sum = 0;

printf("Enter the value of n: ");

scanf("%d", &n);

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

sum += i;

}

printf("Sum of the series is: %d\n", sum);

}

25. (1\*1) + (2\*2) + (3\*3) + (4\*4) + (5\*5) + ... + (n\*n)

#include <stdio.h>

main() {

int n, sum = 0;

printf("Enter the value of n: ");

scanf("%d", &n);

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

sum += i \* i;

}

printf("Sum of the series is: %d\n", sum);

}

26. (1)+ (1+2) + (1+2+3) + (1+2+3+4) + ... + (1+2+3+4+...+n)

#include <stdio.h>

main() {

int n, sum = 0;

printf("Enter the value of n: ");

scanf("%d", &n);

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

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

sum += j;

}

}

printf("Sum of the series is: %d\n", sum);

}

27. 1/2 - 2/3 + 3/4 - 4/5 + 5/6 ..........n

#include <stdio.h>

main() {

int n;

float sum = 0.0;

printf("Enter the value of n: ");

scanf("%d", &n);

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

if (i % 2 == 0) {

sum -= (float)i / (i + 1);

} else {

sum += (float)i / (i + 1);

}

}

printf("Sum of the series is: %.2f\n", sum);

}

28. 1 2 3 6 9 18 27 54...

#include <stdio.h>

main() {

int n;

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

scanf("%d", &n);

int current = 1, step = 3;

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

printf("%d ", current);

if (i % 2 == 0) {

current \*= step;

} else {

current += step;

}

}

printf("\n");

}

**Function Array**

1. Write a program to find out the max number from given array using function

#include <stdio.h>

ifindMax(int arr[], int n) {

int max = arr[0];

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

if (arr[i] > max) {

max = arr[i];

}

}

return max;

}

main() {

int arr[] = {10, 5, 8, 20, 3};

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

int max\_num = findMax(arr, n);

printf("Maximum number is: %d\n", max\_num);

}

2. WAP of Addition, Subtraction, Multiplication and Division using Switch

case.(Must Be Menu Driven)

#include <stdio.h>

main() {

int num1, num2, result;

char operator;

printf("Enter two numbers: ");

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

printf("Enter operator (+, -, \*, /): ");

scanf(" %c", &operator);

switch (operator) {

case '+':

result = num1 + num2;

printf("Sum = %d\n", result);

break;

case '-':

result = num1 - num2;

printf("Difference = %d\n", result);

break;

case '\*':

result = num1 \* num2;

printf("Product = %d\n", result);

break;

case '/':

if (num2 != 0) {

result = num1 / num2;

printf("Quotient = %d\n", result);

} else {

printf("Error: Division by zero\n");

}

break;

default:

printf("Invalid operator\n");

}

}

3. WAP to find reverse of string using recursion

#include <stdio.h>

#include <string.h>

reverseString(char str[], int start, int end) {

if (start >= end) {

return 1;

}

char temp = str[start];

str[start] = str[end];

str[end] = temp;

reverseString(str, start + 1, end - 1);

}

main() {

char str[100];

printf("Enter a string: ");

scanf("%s", str);

int n = strlen(str);

reverseString(str, 0, n - 1);

printf("Reversed string: %s\n", str);

}

4. WAP to find factorial using recursion

#include <stdio.h>

int factorial(int n) {

if (n == 0) {

return 1;

} else {

return n \* factorial(n - 1);

}

}

main() {

int num;

printf("Enter a non-negative integer: ");

scanf("%d", &num);

if (num < 0) {

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

} else {

int fact = factorial(num);

printf("Factorial of %d = %d\n", num, fact);

}

}

5. WAP to take two Array input from user and sort them in ascending or

descending order as per user’s choice

#include<stdio.h>

main()

{

int a[4];

int i,j,temp;

for(i=0;i<4;i++)

{

printf("\n enter the num array 1:");

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

}

for(i=0;i<4;i++)

{

printf("\n enter are : %d",a[i]);

}

for(i=0;i<4;i++)

{

for(j=i+1;j<4;j++)

{

if (a[i]<a[j])

{

temp=a[i];

a[i]=a[j];

a[j]=temp;

}

}

}

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

{

printf("\n asc num : %d",a[i]);

}

}

6. WAP to make addition, Subtraction and multiplication of two matrix using

2-D Array

#include <stdio.h>

main() {

int r, c, a[100][100], b[100][100], sum[100][100], i, j;

printf("Enter the number of rows (between 1 and 100): ");

scanf("%d", &r);

printf("Enter the number of columns (between 1 and 100): ");

scanf("%d", &c);

printf("\nEnter elements of 1st matrix:\n");

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

for (j = 0; j < c; ++j) {

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

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

}

printf("Enter elements of 2nd matrix:\n");

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

for (j = 0; j < c; ++j) {

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

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

}

// adding two matrices

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

for (j = 0; j < c; ++j) {

sum[i][j] = a[i][j] + b[i][j];

}

// printing the result

printf("\nSum of two matrices: \n");

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

for (j = 0; j < c; ++j) {

printf("%d ", sum[i][j]);

if (j == c - 1) {

printf("\n\n");

}

}

}

7. WAP Find out length of string without using inbuilt function

#include<stdio.h>

int main()

{

char a[20];

int i,len=0;

printf("Enter Name :");

gets(a);

for(i=0;a[i]!='\0';i++)

{

len++;

}

printf("Length of string is : %d",len);

}

9. WAP to show difference between Structure and Union.

 **Structure:** A structure is a user-defined data type that groups variables of different data types under a single name. Each member of a structure occupies its own memory space.

 **Union:** A union is also a user-defined data type that groups variables of different data types under a single name, but all members of a union share the same memory location. Only one member can be accessed at a time.

10.WAP to perform Palindrome number using for loop and function

#include <stdio.h>

int isPalindrome(int num) {

int reversed = 0, original = num, remainder;

while (num != 0) {

remainder = num % 10;

reversed = reversed \* 10 + remainder;

num /= 10;

}

return original == reversed;

}

main() {

int num;

printf("Enter a number: ");

scanf("%d", &num);

if (isPalindrome(num)) {

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

} else {

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

}

}

11.WAP to accept 5 numbers from user and display in reverse order using for loop and array

#include <stdio.h>

main() {

int numbers[5];

// Accept 5 numbers from the user

printf("Enter 5 numbers:\n");

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

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

}

// Display the numbers in reverse order

printf("Numbers in reverse order:\n");

for (int i = 4; i >= 0; i--) {

printf("%d\n", numbers[i]);

}

}

12.WAP to accept 5 students name and store it in array

#include <stdio.h>

main() {

char names[5][50]; // Array to store 5 names, each up to 49 characters long

// Accept 5 names from the user

printf("Enter 5 student names:\n");

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

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

fgets(names[i], sizeof(names[i]), stdin);

// Remove newline character if present

names[i][strcspn(names[i], "\n")] = '\0';

}

// Display the names

printf("Student names:\n");

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

printf("%s\n", names[i]);

}

}

13.WAP to accept 5 numbers from user and check entered number is even or odd using of array

#include <stdio.h>

main() {

int numbers[5];

// Accept 5 numbers from the user

printf("Enter 5 numbers:\n");

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

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

}

// Check if each number is even or odd

printf("Checking if numbers are even or odd:\n");

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

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

printf("%d is even\n", numbers[i]);

} else {

printf("%d is odd\n", numbers[i]);

}

}

}

14.Perform 2D matrix array

#include <stdio.h>

main() {

int rows = 2, cols = 3;

int matrix[2][3];

// Accept values for the 2D matrix

printf("Enter values for a 2x3 matrix:\n");

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

for (int j = 0; j < cols; j++) {

printf("Enter value for matrix[%d][%d]: ", i, j);

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

}

}

// Display the 2D matrix

printf("The 2D matrix is:\n");

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

for (int j = 0; j < cols; j++) {

printf("%d ", matrix[i][j]);

}

printf("\n");

}

}

15.Store 5 numbers in array and sort it in ascending order

#include <stdio.h>

main() {

int numbers[5], temp;

// Accept 5 numbers from the user

printf("Enter 5 numbers:\n");

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

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

}

// Sort the array in ascending order

for (int i = 0; i < 5 - 1; i++) {

for (int j = i + 1; j < 5; j++) {

if (numbers[i] > numbers[j]) {

// Swap numbers[i] and numbers[j]

temp = numbers[i];

numbers[i] = numbers[j];

numbers[j] = temp;

}

}

}

// Display the sorted numbers

printf("Numbers in ascending order:\n");

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

printf("%d\n", numbers[i]);

}

}

16.Accept 5 numbers from user and perform sum of array

#include <stdio.h>

main() {

int numbers[5];

int sum = 0;

// Accept 5 numbers from the user

printf("Enter 5 numbers:\n");

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

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

sum += numbers[i];

}

// Display the sum of the numbers

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

}

17.WAP to show difference between Structure and Union

#include <stdio.h>

// Define a structure

struct Student {

int id;

char name[50];

float marks;

};

// Define a union

union Data {

int intValue;

float floatValue;

char strValue[20];

};

main() {

// Demonstrate structure usage

struct Student student1;

student1.id = 1;

snprintf(student1.name, sizeof(student1.name), "John Doe");

student1.marks = 85.5;

printf("Structure:\n");

printf("ID: %d\n", student1.id);

printf("Name: %s\n", student1.name);

printf("Marks: %.2f\n", student1.marks);

// Demonstrate union usage

union Data data;

data.intValue = 10;

printf("\nUnion with intValue:\n");

printf("intValue: %d\n", data.intValue);

data.floatValue = 20.5;

printf("floatValue: %.2f\n", data.floatValue);

snprintf(data.strValue, sizeof(data.strValue), "Hello");

printf("strValue: %s\n", data.strValue);

// Notice how changing one member affects the others in a union

printf("After modifying strValue:\n");

printf("intValue: %d\n", data.intValue); // Undefined value

printf("floatValue: %.2f\n", data.floatValue); // Undefined value

}

**Summary:**

* **Structure**: Allows multiple members of different types and each member has its own memory allocation.
* **Union**: Allows multiple members but only one member can store a value at a time, sharing the same memory space.

**String**

1. Write a program in C to find the length of a string without using library functions.

#include<stdio.h>

main()

{

char a[20];

int i,len=0;

printf("Enter Name :");

gets(a);

for(i=0;a[i]!='\0';i++)

{

len++;

}

printf("Length of string is : %d",len);

}

}2. Write a program in C to separate individual characters from a string.

#include <stdio.h>

main() {

char str[100];

int i;

printf("Enter a string: ");

fgets(str, sizeof(str), stdin);

for (i = 0; str[i] != '\0'; i++) {

printf("%c\n", str[i]);

}

}

3. Write a program in C to print individual characters of a string in reverse order

#include <stdio.h>

main() {

char str[100];

int length = 0;

printf("Enter a string: ");

fgets(str, sizeof(str), stdin);

while (str[length] != '\0') {

length++;

}

// Remove the newline character if present

if (str[length - 1] == '\n') {

length--;

}

for (int i = length - 1; i >= 0; i--) {

printf("%c\n", str[i]);

}

}

4. Write a program in C to count the total number of words in a string.

#include <stdio.h>

int main() {

char str[100];

int count = 0, inWord = 0;

printf("Enter a string: ");

fgets(str, sizeof(str), stdin);

for (int i = 0; str[i] != '\0'; i++) {

// Check if the current character is a whitespace character

if (str[i] == ' ' || str[i] == '\t' || str[i] == '\n') {

inWord = 0;

} else if (inWord == 0) {

inWord = 1;

count++;

}

}

// Remove the newline character if present

if (str[0] != '\n') {

if (str[0] == '\0') {

count = 0;

}

}

printf("Total number of words: %d\n", count);

}

5. Write a program in C to compare two strings without using string library functions.

#include <stdio.h>

main() {

char str1[100], str2[100];

int i = 0;

int equal = 1;

printf("Enter first string: ");

fgets(str1, sizeof(str1), stdin);

printf("Enter second string: ");

fgets(str2, sizeof(str2), stdin);

while (str1[i] != '\0' && str2[i] != '\0') {

if (str1[i] != str2[i]) {

equal = 0;

break;

}

i++;

}

// Remove newline characters if present

if (str1[i] == '\n') str1[i] = '\0';

if (str2[i] == '\n') str2[i] = '\0';

if (str1[i] != str2[i]) {

equal = 0;

}

if (equal) {

printf("Strings are equal.\n");

} else {

printf("Strings are not equal.\n");

}

}

6. Write a program in C to count the total number of alphabets, digits and special characters in a string.

#include <stdio.h>

int main() {

char str[100];

int alphabets = 0, digits = 0, specials = 0;

printf("Enter a string: ");

fgets(str, sizeof(str), stdin);

for (int i = 0; str[i] != '\0'; i++) {

if ((str[i] >= 'a' && str[i] <= 'z') || (str[i] >= 'A' && str[i] <= 'Z')) {

alphabets++;

} else if (str[i] >= '0' && str[i] <= '9') {

digits++;

} else if (!isspace(str[i]) && str[i] != '\n') {

specials++;

}

}

printf("Alphabets: %d\nDigits: %d\nSpecial characters: %d\n", alphabets, digits, specials);

}

7. Write a program in C to copy one string to another string.

#include <stdio.h>

main() {

char source[100], destination[100];

int i = 0;

printf("Enter the source string: ");

fgets(source, sizeof(source), stdin);

while (source[i] != '\0') {

destination[i] = source[i];

i++;

}

destination[i] = '\0'; // Null-terminate the destination string

printf("Copied string: %s\n", destination);

}

8. Write a program in C to count the total number of vowels or consonants in a string.

#include <stdio.h>

int main() {

char str[100];

int vowels = 0, consonants = 0;

printf("Enter a string: ");

fgets(str, sizeof(str), stdin);

for (int i = 0; str[i] != '\0'; i++) {

char ch = tolower(str[i]);

if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u') {

vowels++;

} else if (ch >= 'a' && ch <= 'z') {

consonants++;

}

}

printf("Vowels: %d\nConsonants: %d\n", vowels, consonants);

}

9. Write a program in C to find the maximum number of characters in a string. Topics Covered String

#include <stdio.h>

main() {

char str[100];

int maxChar = 0;

printf("Enter a string: ");

fgets(str, sizeof(str), stdin);

for (int i = 0; str[i] != '\0'; i++) {

int count = 1;

for (int j = i + 1; str[j] != '\0'; j++) {

if (str[i] == str[j]) {

count++;

}

}

if (count > maxChar) {

maxChar = count;

}

}

printf("Maximum number of characters in the string: %d\n", maxChar);

}

10.Write a program in C to extract a substring from a given string

#include <stdio.h>

main() {

char str[100], sub[100];

int start, length;

printf("Enter the string: ");

fgets(str, sizeof(str), stdin);

printf("Enter the start index and length of the substring: ");

scanf("%d %d", &start, &length);

for (int i = 0; i < length && str[start + i] != '\0'; i++) {

sub[i] = str[start + i];

}

sub[length] = '\0'; // Null-terminate the substring

printf("Substring: %s\n", sub);

}

11.Write a program in C to read a sentence and replace lowercase characters with uppercase and vice versa.

#include <stdio.h>

int main() {

char str[100];

printf("Enter a sentence: ");

fgets(str, sizeof(str), stdin);

for (int i = 0; str[i] != '\0'; i++) {

if (str[i] >= 'a' && str[i] <= 'z') {

str[i] = str[i] - 32;

} else if (str[i] >= 'A' && str[i] <= 'Z') {

str[i] = str[i] + 32;

}

}

printf("Modified sentence: %s\n", str);

}

12.Write a program in C to find the number of times a given word 'is' appears in the given string.

#include <stdio.h>

#include <string.h>

main() {

char str[100];

char word[] = "is";

int count = 0;

printf("Enter a string: ");

fgets(str, sizeof(str), stdin);

char \*ptr = str;

while ((ptr = strstr(ptr, word)) != NULL) {

count++;

ptr += strlen(word);

}

printf("The word 'is' appears %d times.\n", count);

}

13.Write a program in C to remove characters from a string except alphabets.

#include <stdio.h>

int main() {

char str[100], result[100];

int j = 0;

printf("Enter a string: ");

fgets(str, sizeof(str), stdin);

for (int i = 0; str[i] != '\0'; i++) {

if ((str[i] >= 'a' && str[i] <= 'z') || (str[i] >= 'A' && str[i] <= 'Z')) {

result[j++] = str[i];

}

}

result[j] = '\0'; // Null-terminate the result string

printf("String with only alphabets: %s\n", result);

}

14.Write a program in C to combine two strings manually

#include <stdio.h>

main() {

char str1[100], str2[100], combined[200];

int i = 0, j = 0;

printf("Enter the first string: ");

fgets(str1, sizeof(str1), stdin);

printf("Enter the second string: ");

fgets(str2, sizeof(str2), stdin);

// Remove the newline character if present

if (str1[i] == '\n') str1[i] = '\0';

if (str2[j] == '\n') str2[j] = '\0';

// Copy the first string to combined

while (str1[i] != '\0') {

combined[i] = str1[i];

i++;

}

// Copy the second string to combined

while (str2[j] != '\0') {

combined[i] = str2[j];

i++;

j++;

}

combined[i] = '\0'; // Null-terminate the combined string

printf("Combined string: %s\n", combined);

}

15.Write a program in C to find the largest and smallest words in a string.

#include <stdio.h>

#include <string.h>

main() {

char str[200], largest[100], smallest[100];

char \*word;

int maxLen = 0, minLen = 100;

printf("Enter a string: ");

fgets(str, sizeof(str), stdin);

// Remove the newline character if present

if (str[strlen(str) - 1] == '\n') str[strlen(str) - 1] = '\0';

// Initialize pointers

largest[0] = '\0';

smallest[0] = '\0';

word = strtok(str, " ");

while (word != NULL) {

int length = strlen(word);

if (length > maxLen) {

maxLen = length;

strcpy(largest, word);

}

if (length < minLen) {

minLen = length;

strcpy(smallest, word);

}

word = strtok(NULL, " ");

}

printf("Largest word: %s\n", largest);

printf("Smallest word: %s\n", smallest);

}