**MODULE: 3**

**SE – Fundamentals of Programming**

|  |
| --- |
| **Topics Covered**  *Basic Syntax*  *Data Structures*  *Variables*  *Operators* |

**Basic Logic Program**

**Q-1. Display This Information using printf.**

**a. Your Name**

**b. Your Birth date**

**c. Your Age**

**d. Your Address**

**Ans-**

#include <stdio.h>

int main()

{

char name[] = "priya patel.";

char birthDate[] = "December 09, 2001";

int age = 23;

char address[] = "giriraj tenament,ghodasar,ahemedabad.";

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

printf(" Your Birth date: %s\n", birthDate);

printf(" Your Age: %d\n", age);

printf(" Your Address: %s\n", address);

}

**Output:**

**Your Name: priya patel.**

**Your Birth date: December 09, 2001**

**Your Age: 23**

**Your Address: giriraj tenament,ghodasar,ahemedabad.**

**Q-2 Write a program to make Simple calculator (to make addition, subtraction, multiplication, division and modulo)**

**Ans-**

#include<stdio.h>

int main()

{

int a=20,b=30; //data members

printf("%d",a);

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

printf("\naddition:%d",a+b);

printf("\nsubtrection:%d",a-b);

printf("\nmultiplication:%d",a\*b);

printf("\ndivision:%d",a/b);

printf("\nmodulo:%d",a%b);

}

**Output:** **20**

**30**

**addition:50**

**subtrection:-10**

**multiplication:600**

**division:0**

**modulo:20**

**Q-3 WAP to Find Area And Circumference of Circle.**

**Ans-**

#include <stdio.h>

int main() {

int PI=34;

double radius, area, circumference;

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

scanf("%lf", &radius);

area = PI \* radius \* radius;

circumference = 2 \* PI \* radius;

printf("Area of the circle: %.2lf\n", area);

printf("Circumference of the circle: %.2lf\n", circumference);

return 0;

}

**Output: Enter the radius of the circle: 34**

**Area of the circle39304.00**

**Circumference of the circle: 2312.00**

**Q-4 Find Area of Square formula : a = a2 .**

**Ans-**

#include<stdio.h>

int main()

{

int side, area;

printf("\nEnter the Length of Side : ");

scanf("%d", &side);

area = side \* side;

printf("\nArea of Square : %d", area);

return (0);

}

**Output: Enter the Length of Side : 12**

**Area of Square : 144**

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

**Ans-**

#include <stdio.h>

void main()

{

float side, surfacearea;

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

scanf("%f", &side);

surfacearea = 6.0 \* side \* side;

printf("Surface area = %6.2f", surfacearea);

}

**Output: Enter the length of a side :12**

**Surface area = 864.00**

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

**Ans-**

#include <stdio.h>

void main()

{

float base,height;

printf("enter base:");

scanf("%f",&base);

printf("enter height :");

scanf("%f",&height);

float area = (base \* height) / 2;

//Area with precision of 2 decimal places

printf("Area of Triangle is %0.2f",area);

}

**Output: enter base:12**

**enter height :36**

**Area of Triangle is 216.00**

**Q-7 Find area of Rectangle Formula : A=wl.**

**Ans-**

#include <stdio.h>

int 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: %f\n", area);

return 0;

}

**Output: Enter the length of the rectangle: 45**

**Enter the width of the rectangle: 78**

**The area of the rectangle is: 3510.000000**

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

**Ans-**

#include <stdio.h>

int main()

{

float length, width, area,c;

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

scanf("%f", &length);

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

scanf("%f", &width);

area = length \* width;

c=4\*area;

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

printf("the circumference is:%f\n",c);

return 0;

}

**Output: Enter the length of the rectangle: 45**

**Enter the width of the rectangle: 36**

**The area of the rectangle is: 1620.000000**

**the circumference is:6480.000000**

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

**Ans-**

#include <stdio.h>

float findPerimeter(float a, float b, float c) // Function to find perimeter

{

return (a + b + c); //formula

}

//calling code

int main()

{

float a = 2.0, b = 3.0, c = 5.0;

printf("%f", findPerimeter(a, b, c));

return 0;

}

**Output:** **10.000000**

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

**Ans-**

#include <stdio.h>

float find\_surface\_area\_of\_Rectangular\_prism(float l, float w, float h) // It is a function to find area

{

float surface\_area\_of\_Rectangular\_prism ;

surface\_area\_of\_Rectangular\_prism = 2 \* ((l \* h) + (w \* h) + (l \* w)); // It is a formula for calculating the area of rectangular prism

return(surface\_area\_of\_Rectangular\_prism );

}

int main()

{

float l = 4.55, w = 9.10, h = 10;

printf("Surface area of the rectangular prism is: %f", find\_surface\_area\_of\_Rectangular\_prism(l,w,h));

return 0;

}

**Output:** **Surface area of the rectangular prism is: 355.809998**

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

**Ans-**

#include <stdio.h>

void main()

{

/\* Variable Declaration. \*/

float side, perimeter, area;

/\* Taking user input \*/

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

scanf("%f", & side);

/\* Calculate Perimeter of the square \*/

perimeter = 4 \* side;

printf("Perimeter of the Square : %0.4f\n", perimeter);

/\* Calculate Area of the square \*/

area = side \* side;

printf("Area of the square : %0.4f\n", area);

}

**Output: Enter the length of the side of the square:**

**12**

**Perimeter of the Square : 48.0000**

**Area of the square : 144.0000**

**Q-12 Accept number of students from user. I need to give 5 apples to each student.**

**How many apples are required?**

**Ans-**

#include <stdio.h>

int main()

{

int num\_Students;

int applesPer\_Student = 5;

int totalApples;

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

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

totalApples = num\_Students \* applesPer\_Student;

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

}

**Output:**

**Enter the number of students: 2**

**Total number of apples required: 10**

**Q-13Find character value from ascii.**

**Ans-**

#include <stdio.h>

int main()

{

char c;

printf("Enter a characterhufhuiwshrfwrygfvy: ");

scanf("%c", &c);

printf("ASCII value of %c = %d", c, c);

return 0;

}

**Output: Enter a character: k**

**ASCII value of k = 107**

**Q-14Find ascii value of given number.**

**Ans-**

#include <stdio.h>

int main()

{

int n;

printf("Enter a number");

scanf("%c", &n);

printf("ASCII cerectors:%d",n);

return 0;

}

**Output: Enter a number2**

**ASCII cerectors:50**

**Q-15Convert school’s name in abbreviated form.**

**Ans-**

#include<stdio.h>

int main()

{

char fname[20],mname[20],lname[20];

printf("enter the school name: \n");

scanf("%s %s %s",fname,mname,lname);

printf("abbreviate name:");

printf("%c. %c. %s\n",fname[0],mname[0],lname);

return 0;

}

**Output: enter the school name:**

**B.V.D high school**

**abbreviate name:B. h. school**

**Q-16Convert country’s name in abbreviate form.**

**Ans-**

#include<stdio.h>

int main()

{

char fname[20],mname[20],lname[20],other[20];

printf("enter the country name: \n");

scanf("%s %s %s %s",fname,mname,lname,other);

printf("abbreviate name:");

printf("%c. %c. %s %s\n",fname[0],mname[0],lname,other);

return 0;

}

**Output: enter the country name:**

**United States of America**

**abbreviate name:U. S. of America**

**Q-17 Calculate person’s insurance premium based on salary.**

**Ans-**

#include<stdio.h>

int main()

{

float sallary,monthaly\_cepicity;

int years;

printf("Enter your sallary:");

scanf("%f", &sallary); //15000

printf("Enter your monthaly cepicity:"); //5000

scanf("%f", &monthaly\_cepicity);

printf("Enter life insurance policy term(in years):"); //20

scanf("%d", &years);

printf("Your Yearly Premium : %8.2f\n",(monthaly\_cepicity\*12/1)) ;

}

**Output: Enter your sallary:15000**

**Enter your monthaly cepicity:5000**

**Enter life insurance policy term(in years):20**

**Your Yearly Premium : 60000.00**

**Q-18Calculate person’s Annual salary.**

**Ans-**

#include <stdio.h>

int main()

{

int monthly\_salary,annual\_salary;

printf("enter your monthaly salary:");

scanf("%d",&monthly\_salary);

// annual\_salary=12\*monthly\_salary/1;

printf("your annual salary is:%d\n", (annual\_salary=12\*monthly\_salary/1));

return 0;

}

**Output: enter your monthaly salary:5000**

**your annual salary is:60000**

**Q- 19 Calculate compound interest.**

**Ans-**

#include <stdio.h>

#include<math.h>

int main()

{

float principle, rate, time;

printf("Enter principle (amount): ");

scanf("%f", &principle);

printf("Enter time: ");

scanf("%f", &time);

printf("Enter rate: ");

scanf("%f", &rate);

//compound interest= principle\* (pow((1 + rate / 100), time));

printf("Compound Interest = %f",principle\* (pow((1 + rate / 100), time)));

}

**Output: Enter principle (amount): 1200**

**Enter time: 2**

**Enter rate: 5.4**

**Compound Interest = 1333.099251**

**Q-20 Accept monthly salary from the user and deduct 10% insurance premium,**

**10% loan installment find out of remaining salary.**

**Ans-**

#include <stdio.h>

int main()

{

int monthly\_salary;

printf("enter your monthly salary:");

scanf("%d",& monthly\_salary);

printf("deduct 10 percentage insurance premium %d",monthly\_salary\*10/100);

printf("\nafter total salary:%d",monthly\_salary-monthly\_salary\*10/100);

printf("\n10 percentage loan installment find out of total salary %d",(monthly\_salary-monthly\_salary\*10/100)\*10/100);

// printf("\nafter save salary:%d",monthly\_salary-monthly\_salary-monthly\_salary\*10/100\*10/100);

return 0;

}

**Output:** **enter your monthly salary:25000**

**deduct 10 percentage insurance premium 2500**

**after total salary:22500**

**10 percentage loan installment find out of total salary 2250**

**Q-21 Accept 2 numbers from user and swap 2 numbers with using**

**3rd variable and without using 3rd variable.**

**Ans-**

#include<stdio.h>

int main()

{

int a,b,temp;

printf("enter number a:");

scanf("%d",&a);

printf("enter number b:");

scanf("%d",&b);

temp=a;

a=b;

b=temp;

printf("a is aftre swap:a=%d,b is aftre swap:b=%d",a,b);

}

**Output: enter number a:5**

**enter number b:4**

**a is aftre swap:a=4,b is aftre swap:b=5**

**Q-22Calculate 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.**

**Ans-**

#include <stdio.h>

#include <math.h>

int main()

{

double principal, rate, time, amount, compoundInterest;

printf("Enter the principal amount: ");

scanf("%lf", &principal);

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

scanf("%lf", &rate);

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

scanf("%lf", &time);

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

compoundInterest = amount - principal;

printf("The accumulated amount after %.2lf years is: %.2lf\n", time, amount);

printf("The compound interest is: %.2lf\n", compoundInterest);

}

**Output:**

**Enter the principal amount: 32000**

**Enter the annual interest rate (in percentage): 25000**

**Enter the time (in years): 2**

**The accumulated amount after 2.00 years is: 2016032000.00**

**The compound interest is: 2016000000.00**

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

**Ans-**

#include <stdio.h>

int main()

{

double a, b;

printf("Enter a: ");

scanf("%lf", &a);

printf("Enter b: ");

scanf("%lf", &b);

// swapping

a = a / b;

b = a \* b;

a = b / a;

// %.2lf displays numbers up to 2 decimal places

printf("After swapping, a = %.2lf\n", a);

printf("After swapping, b = %.2lf", b);

return 0;

}

**Output: Enter a: 4**

**Enter b: 2**

**After swapping, a = 2.00**

**After swapping, b = 4.00**

**Q-24 Accept 5 employees name and salary and count average and total salary.**

**Ans-**

#include <stdio.h>

#define NUM\_EMPLOYEES 5

int main()

{

char names[NUM\_EMPLOYEES][50];

double salaries[NUM\_EMPLOYEES];

double totalSalary = 0;

double averageSalary;

int i;

for (i = 0; i < NUM\_EMPLOYEES; i++)

{

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

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

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

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

totalSalary += salaries[i];

}

// Calculate average salary

averageSalary = totalSalary / NUM\_EMPLOYEES;

printf("\nTotal salary of all employees: %.2lf\n", totalSalary);

printf("Average salary of all employees: %.2lf\n", averageSalary);

}

**Output:**

**Enter name of employee 1: priya**

**Enter salary of employee 1: 86000**

**Enter name of employee 2: mahi**

**Enter salary of employee 2: 65000**

**Enter name of employee 3: jay**

**Enter salary of employee 3: 59000**

**Enter name of employee 4: neha**

**Enter salary of employee 4: 80000**

**Enter name of employee 5: janvi**

**Enter salary of employee 5: 45000**

**Total salary of all employees: 335000.00**

**Average salary of all employees: 67000.00**

**Q- 25.Accept 5 expense from user and find average of expense**

**Ans-**

#include <stdio.h>

#define NUM\_EXPENSES 5

int main()

{

double expenses[NUM\_EXPENSES];

double totalExpenses = 0;

double averageExpenses;

int i;

for (i = 0; i < NUM\_EXPENSES; i++)

{

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

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

totalExpenses += expenses[i];

}

averageExpenses = totalExpenses / NUM\_EXPENSES;

printf("\nTotal expenses: %.2lf\n", totalExpenses);

printf("Average expense: %.2lf\n", averageExpenses);

}

**Output:**

**Enter expense 1: 45**

**Enter expense 2: 24**

**Enter expense 3: 58**

**Enter expense 4: 33**

**Enter expense 5: 15**

**Total expenses: 175.00**

**Average expense: 35.00**

**Q-26 Convert temperature Fahrenheit to Celsius**

**Ans-**

#include <stdio.h>

int main()

{

double fahrenheit, celsius;

printf("Enter temperature in Fahrenheit: ");

scanf("%lf", &fahrenheit);

celsius = (fahrenheit - 32) \* 5.0 / 9.0;

printf("%.2lf Fahrenheit is equal to %.2lf Celsius\n", fahrenheit, celsius);

}

**Output:**

**Enter temperature in Fahrenheit: 1225**

**1225.00 Fahrenheit is equal to 662.78 Celsius**

**Q-27 Convert days into months**

**Ans-**

#include <stdio.h>

int main()

{

int total\_days, months, days;

const float days\_in\_month = 30.44; // Average days in a month

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

scanf("%d", &total\_days);

months = total\_days / days\_in\_month;

days = total\_days - (months \* days\_in\_month);

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

}

**Output:**

**Enter the total number of days: 132**

**132 days is approximately 4 months and 10 days.**

**Q-28.Convert years into days and months**

**Ans-**

#include <stdio.h>

int main()

{

int years, days, months, remaining\_days;

const float days\_in\_month = 30.44; // Average days in a month

const int days\_in\_year = 365; // Average days in a year

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

scanf("%d", &years);

days = years \* days\_in\_year;

months = days / days\_in\_month;

remaining\_days = days - (months \* days\_in\_month);

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

}

**Output:**

**Enter the number of years: 5**

**5 years is approximately 1825 days or 59 months and 29 days.**

**Q-29.Convert minutes into seconds and hours**

**Ans-**

#include <stdio.h>

int main()

{

int total\_minutes, hours, minutes, seconds;

const int minutes\_in\_hour = 60;

const int seconds\_in\_minute = 60;

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

scanf("%d", &total\_minutes);

hours = total\_minutes / minutes\_in\_hour; // Calculate hours

minutes = total\_minutes % minutes\_in\_hour; // Calculate remaining minutes

seconds = total\_minutes \* seconds\_in\_minute; // Calculate total seconds

printf("%d minutes is equivalent to %d hours, %d minutes, and %d seconds.\n", total\_minutes, hours, minutes, seconds);

return 0;

}

**Output:**

**Enter the total number of minutes: 60**

**60 minutes is equivalent to 1 hours, 0 minutes, and 3600 seconds.**

**Q-30.WAP to convert years into days and days into years**

**Ans-**

#include <stdio.h>

void yearsToDays()

{

int years, days;

const float days\_in\_year = 365.25;

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

scanf("%d", &years);

days = years \* days\_in\_year;

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

}

void daysToYears()

{

int total\_days, years, remaining\_days;

const float days\_in\_year = 365.25;

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

scanf("%d", &total\_days);

years = total\_days / days\_in\_year;

remaining\_days = total\_days % (int)days\_in\_year;

printf("%d days is equivalent to approximately %d years and %d days.\n", total\_days, years, remaining\_days);

}

int main()

{

int choice;

printf("Choose an option:\n");

printf("1. Convert years to days\n");

printf("2. Convert days to years\n");

printf("Enter your choice (1 or 2): ");

scanf("%d", &choice);

switch (choice)

{

case 1:

yearsToDays();

break;

case 2:

daysToYears();

break;

default:

printf("Invalid choice!\n");

}

return 0;

}

**Output:**

**Choose an option:**

**1. Convert years to days**

**2. Convert days to years**

**Enter your choice (1 or 2): 1**

**Enter the number of years: 5**

**5 years is equivalent to approximately 1826 days.**

**Choose an option:**

**1. Convert years to days**

**2. Convert days to years**

**Enter your choice (1 or 2): 2**

**Enter the total number of days: 1444**

**1444 days is equivalent to approximately 3 years and 349 days.**

**Choose an option:**

**1. Convert years to days**

**2. Convert days to years**

**Enter your choice (1 or 2): 5662**

**Invalid choice!**

**Q-31.Convert kilometers into meters**

**Ans-**

#include <stdio.h>

int main()

{

float km, meters;

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

scanf("%f", &km);

meters = km \* 1000;

printf("%.2f kilometers is equivalent to %.2f meters.\n", km, meters);

return 0;

}

**Output:**

**Enter the number of kilometers: 100**

**100.00 kilometers is equivalent to 100000.00 meters.**

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

**Ans-**

#include <stdio.h>

#include <limits.h>

int main()

{

int n1, n2;

long long sum;

printf("Enter the first number: ");

scanf("%d", &n1);

printf("Enter the second number: ");

scanf("%d", &n2);

sum = (long long)n1 + (long long)n2;

printf("The sum of %d and %d is %lld.\n", n1, n2, sum);

if (sum > INT\_MAX)

{

printf("The sum exceeds the maximum value of an integer (overflow).\n");

}

return 0;

}

**Output:**

**Enter the first number: 45**

**Enter the second number: 12**

**The sum of 45 and 12 is 57.**

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

**Ans-**

#include <stdio.h>

int main()

{

int number;

int power1, power2, power3;

printf("Enter an number: ");

scanf("%d", &number);

power1 = number; // Calculate the powers

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);

return 0;

}

**Output:**

**Enter an number: 12**

**12^1 = 12**

**12^2 = 144 //12\*12**

**12^3 = 1728 //12\*12\*12**

**Topics Covered**

**Control statements**

**Conditional Statements**

**Conditional Logic Programs:**

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

**Ans-**

#include <stdio.h>

main()

{

int n1, n2;

printf("enter the values for Number1 : ");

scanf("%d", &n1);

printf("enter the values for Number2 : ");

scanf("%d", &n2);

if (n1 == n2)

{

printf("Number1 and Number2 are equal\n");

}

else

{

printf("Number1 and Number2 are not equal\n");

}

}

**Output:** Input the values for Number1 and Number2 : 15 15

Number1 and Number2 are equal

**Q- 2. Write a C program to read the value of an integer m and**

**display the value of n is 1 when m is larger than 0, 0 when m is 0 and -1 when m is less than 0**

**Ans-**

#include <stdio.h>

main()

{

int m,n;

printf("enter number of m :");

scanf("%d",&m);

if(m!=0) // 'm' is not equal to 0.

{

if(m>0)

n=1; // 'm' is greater than 0, set 'n' to 1.

else

n=-1; // 'm' is less than 0, set 'n' to -1.

}

else

n=0; // 'm' is equal to 0, set 'n' to 0.

printf("The number of m = %d \n",m);

printf("The number of n = %d \n",n);

}

**Output: Input the value of m :-5**

**The value of m = -5**

**The value of n = -1**

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

**Ans-**

#include<stdio.h>

main()

{

int year;

printf("Enter a year: ");

scanf("%d", &year);

if((year%4==0)

{

printf(" leap year", &year);

}

else

{

printf(" not a leap year", &year);

}

}

**Output: Enter a year: 2024**

**leap year**

**Q-4 WAP to make simple calculator**

**(operation include Addition, Subtraction, Multiplication, Division, modulo) using conditional statement**

**Ans-**

#include <stdio.h>

main()

{

int number1, number2, addition, subtraction, multiply;

float divide,modules;

printf("Enter Number 1\n");

scanf("%d", &number1);

printf("Enter Number 2\n");

scanf("%d", &number2);

addition = number1 + number2 ;

subtraction = number1 - number2;

multiply = number1 \* number2;

divide = number1 / (float)number2;

modules = number1 % number2;

printf("Addition = %d\n",addition);

printf("Subtraction = %d\n",subtraction);

printf("Multiplication = %d\n",multiply);

printf("Division = %.2f\n",divide);

printf("Modules= %.2f\n",modules);

}

**Output: Enter Number 1**

**4**

**Enter Number 2**

**5**

**Addition = 9**

**Subtraction = -1**

**Multiplication = 20**

**Division = 0.80**

**Modules= 4.00**

**Q-5. Check Number Is Positive or Negative**

**Ans-**

#include <stdio.h>

main()

{

int a;

printf("Enter the number 1: ");

scanf("%d", &a);

if (A > 0)

printf("%d is positive",a);

else if (A < 0)

printf("%d is negative",a);

else if (A == 0)

printf("%d is zero",a);

}

**Output: Enter the number A =: -54**

**-54 is negative.**

**Q-6. Find the Character Is Vowel or Not**

**Ans-**

#include <stdio.h>

int main() {

char c;

int vowel;

printf("Enter an alphabet: ");

scanf("%c", &c);

vowel = (c == 'a' || c == 'e' || c == 'i' || c == 'o' || c == 'u');

if (vowel)

{

printf("%c is a vowel.", c);

}

else

{

printf("%c is a consonant.", c);

}

}

**Output: Enter an alphabet: i**

**i is a vowel.**

**Enter an alphabet: k**

**k is a consonant.**

**Q-7. Accept marks from user and check pass or fail**

**Ans-**

#include <stdio.h>

main() {

int marks;

printf("enter marks(0-100) \n");

scanf("%d", &marks );

if (marks <= 30){

printf ("fail\n");

}

else if ( marks >30 && marks <= 100)

{ printf(" pass");}

else { printf(" wrong marks");

}

}

**Output**:

**enter marks(0-100)**

**12**

**Fail**

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

**Ans-**

#include <stdio.h>

main()

{

float Height;

printf("Inter the height of the person (in centimetres) :");

scanf("%f", &Height);

if (Height < 150.0)

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

else if ((Height >= 150.0) && (Height < 165.0))

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

else if ((Height >= 165.0) && (Height <= 195.0))

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

else

printf("Abnormal height.\n");

}

**Output:**

**Input the height of the person (in centimetres) :5.4**

**The person is shorter.**

**Q-9. C Program to Check Uppercase or Lowercase or Digit or Special Character**

**Ans-**

#include <stdio.h>

main()

{

char ch;

printf("Enter character: ");

scanf("%c", &ch);

if(ch >= 'A' && ch <= 'Z')

{

printf("'%c' is uppercase alphabet.", ch);

}

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

{

printf("'%c' is lowercase alphabet.", ch);

}

else

{

printf("'%c' is not an alphabet.", ch);

}

}

**Output:**

**Enter character: a**

**'a' is lowercase alphabet.**

**Enter character: A**

**'A' is uppercase alphabet.**

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

**Ans-**

#include <stdio.h>

main()

{

int a;

printf("Enter the number 1: ");

scanf("%d", &a);

if (a> 0)

printf("%d is positive.",a);

else if (a< 0)

printf("%d is negative.",a);

else if (a== 0)

printf("%d is zero.",a);

}

**Output:**

**Enter the number 1: 1**

**1 is positive.**

**Enter the number 1: -1**

**-1 is negative.**

**Enter the number 1: 0**

**0 is zero.**

**Q-11 WAP to find number is even or odd using ternary operator**

**Ans-**

#include<stdio.h>

main()

{

int n;

printf("enter number:");

scanf("%d",&n);

if (n%2==0)

{

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

}

else

{

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

}

}

**Output:**

**enter number:4**

**4 number is even**

**enter number:5**

**5 number is odd**

**Q-12 WAP to find maximum number among 3 numbers using ternary operator**

**Ans-**

#include <stdio.h>

main()

{

int n1,n2,n3,max;

printf("enter the number 1:");

scanf("%d",&n1);

printf("enter the number 2:");

scanf("%d",&n2);

printf("enter the number 3:");

scanf("%d",&n3);

max = (n1 > n2) ? (n1 > n3 ? n1 : n3) : (n2 > n3 ? n2 : n3);

printf("Largest number among %d, %d and %d is %d.",n1, n2, n3, max);

}

**Output:**

**enter the number 1:4**

**enter the number 2:5**

**enter the number 3:9**

**Largest number among 4, 5 and 9 is 9.**

**Q-13 WAP to find minimum number among 3 numbers using ternary operator**

**Ans-**

#include <stdio.h>

main()

{

int n1,n2,n3,min;

printf("enter the number 1:");

scanf("%d",&n1);

printf("enter the number 2:");

scanf("%d",&n2);

printf("enter the number 3:");

scanf("%d",&n3);

max = (n1 < n2) ? (n1 < n3 ? n1 : n3) : (n2 < n3 ? n2 : n3);

printf("minimum number among %d, %d and %d is %d.",n1, n2, n3,min);

}

**Output:**

**enter the number 1:4**

**enter the number 2:5**

**enter the number 3:8**

**minimum number among 4, 5 and 8 is 4.**

**Q- 14 WAP to find the largest of three numbers.**

**Ans-**

#include <stdio.h>

main()

{

int a, b, c;

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

printf("a: ");

scanf("%d", &a);

printf("b: ");

scanf("%d", &b);

printf("c: ");

scanf("%d", &c);

if (a > b && a > c)

printf("largest number is %d", a);

if (b > a && b > c)

printf("largest number is %d", b);

if (c > a && c > b)

printf("largest number is %d", c);

}

**Output:**

**Enter three numbers:**

**a: 1**

**b: 4**

**c: 6**

**largest number is 6**

**Enter three numbers:**

**a: 45**

**b: 99**

**c: 78**

**largest number is 99**

**Q- 15 Write a C program to determine eligibility for admission to a professional course 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 obtained in Mathematics :72 Total marks of Maths,**

**Physics and Chemistry : 188 Total marks of Maths and Physics : 137 The candidate is not eligible.**

**Ans-**

#include <stdio.h>

int main()

{

int math\_marks, phy\_marks, chem\_marks;

int total\_marks, math\_phy\_total;

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

scanf("%d", &phy\_marks);

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

scanf("%d", &chem\_marks);

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

scanf("%d", &math\_marks);

total\_marks = math\_marks + phy\_marks + chem\_marks;

math\_phy\_total = math\_marks + phy\_marks;

printf("Total marks of Maths, Physics and Chemistry: %d\n", total\_marks);

printf("Total marks of Maths and Physics: %d\n", math\_phy\_total);

if ((math\_marks >= 65 && phy\_marks >= 55 && chem\_marks >= 50 && total\_marks >= 190) || math\_phy\_total >= 140)

{

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

}

else

{

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

}

return 0;

}

**Output:**

**Input the marks obtained in Physics: 72**

**Input the marks obtained in Chemistry: 70**

**Input the marks obtained in Mathematics: 65**

**Total marks of Maths, Physics and Chemistry: 207**

**Total marks of Maths and Physics: 137**

**The candidate is eligible.**

**Q-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**

**Ans-**

#include <stdio.h>

int main()

{

float temperature;

printf("Enter the temperature : ");

scanf("%f", &temperature);

if (temperature < 0)

{

printf("Freezing weather\n");

}

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

{

printf("Very Cold weather\n");

}

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

{

printf("Cold weather\n");

}

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

{

printf("Normal in Temp\n");

}

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

{

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

}

else if (temperature >= 40)

{

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

}

return 0;

}

**Output:**

**Enter the temperature : 9**

**Very Cold weather**

**Enter the temperature : 20**

**Cold weather**

**Enter the temperature : 28**

**Normal in Temp**

**Enter the temperature : 35**

**It's Hot**

**Enter the temperature : 100**

**It's Very Hot**

**Enter the temperature : -10**

**Freezing weather**

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

**Ans-**

#include <stdio.h>

main()

{

float a,b,c;

printf("enter three angles of triangle\n");

printf("enter a:");

scanf("%f",&a);

printf("enter b:");

scanf("%f",&b);

printf("enter c:");

scanf("%f",&c);

if((a+b+c)==180)

printf("triangle formed");

else

printf("triangle not formed");

}

**Output:**

**enter three angles of triangle**

**enter a:4**

**enter b:8**

**enter c:3**

**triangle not formed**

**enter three angles of triangle**

**enter a:99**

**enter b:45**

**enter c:36**

**triangle formed**

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

**Ans-**

#include <stdio.h>

void main()

{

int cprice, sprice, profit\_amount;

printf("Inter Cost Price: ");

scanf("%d", &cprice);

printf("Inter Selling Price: ");

scanf("%d", &sprice);

if(sprice > cprice)

{

profit\_amount = sprice - cprice;

printf("\nYou can book your profit amount : %d\n", profit\_amount);

}

else if(cprice > sprice)

{

profit\_amount = cprice - sprice;

printf("\nYou incurred a loss of amount : %d\n", profit\_amount);

}

else

{

printf("\nYou are in a no profit, no loss condition.\n");

}

}

**Output:**

**Inter Cost Price: 200**

**Inter Selling Price: 100**

**You incurred a loss of amount : 100**

**Inter Cost Price: 300**

**Inter Selling Price: 500**

**You can book your profit amount : 200**

**Q- 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 :**

|  |
| --- |
| 20. Unit 21. Charge/unit |
|  |
| 22. upto 350 23. @1.20 |
|  |
| 24. 350 and above but |
| less than 600 25. @1.50 |
|  |
| 26. 600 and above but |
| less than 800 27. @1.80 |
|  |
| 28. 800 and above 29. @2.00 |

**Ans-**

#include <stdio.h>

int main()

{

int customerID;

char customerName[50];

float unitsConsumed, totalAmount;

printf("Enter Customer ID: ");

scanf("%d", &customerID);

printf("Enter Customer Name: ");

scanf("%s", customerName);

printf("Enter Units Consumed: ");

scanf("%f", &unitsConsumed);

// Calculate the total amount based on the units consumed

if (unitsConsumed < 350)

{

totalAmount = unitsConsumed \* 1.20;

}

else if (unitsConsumed >= 350 && unitsConsumed < 600)

{

totalAmount = unitsConsumed \* 1.50;

}

else if (unitsConsumed >= 600 && unitsConsumed < 800)

{

totalAmount = unitsConsumed \* 1.80;

}

else

{

totalAmount = unitsConsumed \* 2.00;

}

printf("\nElectricity Bill:\n");

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

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

printf("Units Consumed: %.2f\n", unitsConsumed);

printf("Total Amount: $%.2f\n", totalAmount);

return 0;

}

**Output:**

**Enter Customer ID: 382224110008**

**Enter Customer Name:priya**

**Enter Units Consumed: 2000**

**Electricity Bill:**

**Customer ID: 382224**

**Customer Name: ame:priya**

**Units Consumed: 2000.00**

**Total Amount: $4000.00**

**Q-30 If bill exceeds Rs. 800 then a surcharge of 18% will be charged andthe minimum bill should be of Rs. 256/-**

**Ans-**

#include <stdio.h>

int main()

{

float bill\_amount, total\_bill;

printf("Enter bill amount: ");

scanf("%f", &bill\_amount);

// Calculate total bill with surcharge if applicable

if (bill\_amount > 800)

{

total\_bill = bill\_amount + (bill\_amount \* 0.18);

// Adding 18% surcharge

}

else

{

total\_bill = bill\_amount;

}

// Ensure the minimum bill amount is Rs. 256

if (total\_bill < 256)

{

total\_bill = 256;

}

printf("Total bill amount: Rs. %.2f\n", total\_bill);

return 0;

}

**Output:**

**Enter bill amount: 400**

**Total bill amount: Rs. 400.00**

**Enter bill amount: 2000**

**Total bill amount: Rs. 2360.00**

**Enter bill amount: 100**

**Total bill amount: Rs. 256.00**

**Q-31 Write a program in C to read any Month Number in integer and display the number of days for this month.**

**Ans-**

include <stdio.h>

main()

{

int monno;

char monnm[15]; // arry for month name

printf("Inter Month No : ");

scanf("%d",&monno);

switch(monno)

{

case 1:

case 3:

case 5:

case 7:

case 8:

case 10:

case 12:

printf("Month have 31 days. \n");

break;

case 2:

printf("The 2nd month is a February and have 28 days. \n");

printf("in leap year The February month Have 29 days.\n");

break;

case 4:

case 6:

case 9:

case 11:

printf("Month have 30 days. \n");

break;

default:

printf("Invalid Month number.\nPlease try again ....\n");

break;

}

}

**Output:**

**Inter Month No : 13**

**Invalid Month number.**

**Please try again ....**

**Inter Month No : 12**

**Month have 31 days.**

**Inter Month No : 11**

**Month have 30 days.**

**Inter Month No : 2**

**The 2nd month is a February and have 28 days.**

**in leap year The February month Have 29 days.**

**Q-32 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%\**

**Ans-**

#include <stdio.h>

int main()

{

float basic\_salary, gross\_salary;

float hra, da;

printf("Enter the Basic Salary of the employee: ");

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;

}

// Calculate Gross Salary

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

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

return 0;

}

**Output:**

**Enter the Basic Salary of the employee: 10000**

**Gross Salary = 20000.00**

**Q-33 WAP to input the week number and print week day.**

**Ans-**

#include <stdio.h>

main()

{

int week;

printf("Enter week number : "); //(1-7)

scanf("%d", &week);

if(week == 1)

{

printf("Monday");

}

else if(week == 2)

{

printf("Tuesday");

}

else if(week == 3)

{

printf("Wednesday");

}

else if(week == 4)

{

printf("Thursday");

}

else if(week == 5)

{

printf("Friday");

}

else if(week == 6)

{

printf("Saturday");

}

else if(week == 7)

{

printf("Sunday");

}

else

{

printf("Invalid Input!");

}

}

**Output:**

**Enter week number : 1**

**Monday**

**Enter week number : 7**

**Sunday**

**Enter week number : 7**

**Sunday**

**Q-34 Accept month number and display month name**

**Ans-**

#include <stdio.h>

void main()

{

int monno;

printf("Inter Month Number : ");

scanf("%d",&monno);

switch(monno)

{

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");

break;

}

}

**Output:**

**Inter Month Number : 2**

**February**

**Q-35 Accept the input month number and print number of days in that month.**

**Ans-**

#include <stdio.h>

main()

{

int monno;

char monnm[15]; // arry for month name

printf("Inter Month No : ");

scanf("%d",&monno);

switch(monno)

{

case 1:

case 3:

case 5:

case 7:

case 8:

case 10:

case 12:

printf("Month have 31 days. \n");

break;

case 2:

printf("The 2nd month is a February and have 28 days. \n");

printf("in leap year The February month Have 29 days.\n");

break;

case 4:

case 6:

case 9:

case 11:

printf("Month have 30 days. \n");

break;

default:

printf("Invalid Month number.\nPlease try again ....\n");

break;

}

}

**Output:**

**Inter Month No : 13**

**Invalid Month number.**

**Please try again ....**

**Inter Month No : 12**

**Month have 31 days.**

**Inter Month No : 11**

**Month have 30 days.**

**Inter Month No : 2**

**The 2nd month is a February and have 28 days.**

**in leap year The February month Have 29 days.**

**Q-36 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**

**Ans-**

#include <stdio.h>

int main()

{

float units, total\_bill;

float surcharge\_rate = 0.20;

printf("Enter the electricity units consumed: ");

scanf("%f", &units);

// Calculate electricity bill based on the given conditions

if (units <= 50)

{

total\_bill = units \* 0.50;

}

else if (units <= 150)

{

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

}

else if (units <= 250)

{

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

}

else

{

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

}

total\_bill += total\_bill \* surcharge\_rate;

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

return 0;

}

**Output:**

**Enter the electricity units consumed: 800**

**Total Electricity Bill = Rs. 1254.00**

**Q- 37 WAP to show**

1. **Monday to Sunday using switch case**
2. **Vowel or Consonant using switch case**

**Ans-**

1. **Monday to Sunday using switch case**

#include <stdio.h>

main()

{

int week;

printf("Enter week number: "); //(1-7)

scanf("%d", &week);

switch(week)

{

case 1:

printf("Monday");

break;

case 2:

printf("Tuesday");

break;

case 3:

printf("Wednesday");

break;

case 4:

printf("Thursday");

break;

case 5:

printf("Friday");

break;

case 6:

printf("Saturday");

break;

case 7:

printf("Sunday");

break;

default:

printf("Invalid input!");

}

}

**Output:**

**Enter week number: 1**

**Monday**

1. **Vowel or Consonant using switch case**

#include <stdio.h>

main()

{

char ch;

printf("Enter any alphabet: ");

scanf("%c", &ch);

switch(ch)

{

case 'a':

printf("Vowel");

break;

case 'e':

printf("Vowel");

break;

case 'i':

printf("Vowel");

break;

case 'o':

printf("Vowel");

break;

case 'u':

printf("Vowel");

break;

case 'A':

printf("Vowel");

break;

case 'E':

printf("Vowel");

break;

case 'I':

printf("Vowel");

break;

case 'O':

printf("Vowel");

break;

case 'U':

printf("Vowel");

break;

default:

printf("Consonant");

}

}

**Output:**

**Enter any alphabet: a**

**Vowel**

**Enter any alphabet: b**

**Consonant**

**Topics Covered**

**Looping Statements**

**Conditional Statements**

**Q-1 WAP to print 972 to 897 using for loop**

**Ans-**

#include <stdio.h>

int main()

{

int i;

for ( i = 897; i <=972; i++ )

{

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

}

}

**Output:**

**897**

**898**

**899**

**900**

**901**

**902**

**903**

**904**

**905**

**906**

**907**

**908**

**909**

**910**

**911**

**912**

**913**

**914**

**915**

**916**

**917**

**918**

**919**

**920**

**921**

**922**

**923**

**924**

**925**

**926**

**927**

**928**

**929**

**930**

**931**

**932**

**933**

**934**

**935**

**936**

**937**

**938**

**939**

**940**

**941**

**942**

**943**

**944**

**945**

**946**

**947**

**948**

**949**

**950**

**951**

**952**

**953**

**954**

**955**

**956**

**957**

**958**

**959**

**960**

**961**

**962**

**963**

**964**

**965**

**966**

**967**

**968**

**969**

**970**

**971**

**972**

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

**Ans-**

#include <stdio.h>

main()

{

int numbers[5];

int i;

printf("Enter numbers:\n");

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

{

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

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

}

printf("\nnumbers you entered are:\n");

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

{

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

}

}

**Output:**

**Enter numbers:**

**Number 1: 78**

**Number 2: 14**

**Number 3: 35**

**Number 4: 75**

**Number 5: 68**

**numbers you entered are:**

**78**

**14**

**35**

**75**

**68**

**Q- 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**

**Ans-**

#include <stdio.h>

int main()

{

int numbers[10];

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

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

printf("Please enter 10 numbers:\n");

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

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

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

}

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

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

even\_count++;

even\_sum += numbers[i];

} else {

odd\_count++;

odd\_sum += numbers[i];

}

}

printf("\nResults:\n");

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

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

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

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

}

**Output:**

**Please enter 10 numbers:**

**Enter number 1: 45**

**Enter number 2: 84**

**Enter number 3: 69**

**Enter number 4: 36**

**Enter number 5: 74**

**Enter number 6: 25**

**Enter number 7: 94**

**Enter number 8: 36**

**Enter number 9: 14**

**Enter number 10: 24**

**Results:**

**Number of even numbers: 7**

**Number of odd numbers: 3**

**Sum of even numbers: 362**

**Sum of odd numbers: 139**

**Q-4. WAP to print table up to given numbers**

**Ans-**

#include <stdio.h>

print\_tables(int n)

{

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

{

printf("Multiplication Table for %d:\n", i);

for (int j = 1; j <= 10; j++)

{

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

}

printf("--------------------\n");

}

}

int main()

{

int num;

printf("Enter the number up to which you want to print the multiplication tables: ");

scanf("%d", &num);

print\_tables(num);

}

**Output:**

**Enter the number up to which you want to print the multiplication tables: 11**

**Multiplication Table for 1:**

**1 x 1 = 1**

**1 x 2 = 2**

**1 x 3 = 3**

**1 x 4 = 4**

**1 x 5 = 5**

**1 x 6 = 6**

**1 x 7 = 7**

**1 x 8 = 8**

**1 x 9 = 9**

**1 x 10 = 10**

**--------------------**

**Multiplication Table for 2:**

**2 x 1 = 2**

**2 x 2 = 4**

**2 x 3 = 6**

**2 x 4 = 8**

**2 x 5 = 10**

**2 x 6 = 12**

**2 x 7 = 14**

**2 x 8 = 16**

**2 x 9 = 18**

**2 x 10 = 20**

**--------------------**

**Multiplication Table for 3:**

**3 x 1 = 3**

**3 x 2 = 6**

**3 x 3 = 9**

**3 x 4 = 12**

**3 x 5 = 15**

**3 x 6 = 18**

**3 x 7 = 21**

**3 x 8 = 24**

**3 x 9 = 27**

**3 x 10 = 30**

**--------------------**

**Multiplication Table for 4:**

**4 x 1 = 4**

**4 x 2 = 8**

**4 x 3 = 12**

**4 x 4 = 16**

**4 x 5 = 20**

**4 x 6 = 24**

**4 x 7 = 28**

**4 x 8 = 32**

**4 x 9 = 36**

**4 x 10 = 40**

**--------------------**

**Multiplication Table for 5:**

**5 x 1 = 5**

**5 x 2 = 10**

**5 x 3 = 15**

**5 x 4 = 20**

**5 x 5 = 25**

**5 x 6 = 30**

**5 x 7 = 35**

**5 x 8 = 40**

**5 x 9 = 45**

**5 x 10 = 50**

**--------------------**

**Multiplication Table for 6:**

**6 x 1 = 6**

**6 x 2 = 12**

**6 x 3 = 18**

**6 x 4 = 24**

**6 x 5 = 30**

**6 x 6 = 36**

**6 x 7 = 42**

**6 x 8 = 48**

**6 x 9 = 54**

**6 x 10 = 60**

**--------------------**

**Multiplication Table for 7:**

**7 x 1 = 7**

**7 x 2 = 14**

**7 x 3 = 21**

**7 x 4 = 28**

**7 x 5 = 35**

**7 x 6 = 42**

**7 x 7 = 49**

**7 x 8 = 56**

**7 x 9 = 63**

**7 x 10 = 70**

**--------------------**

**Multiplication Table for 8:**

**8 x 1 = 8**

**8 x 2 = 16**

**8 x 3 = 24**

**8 x 4 = 32**

**8 x 5 = 40**

**8 x 6 = 48**

**8 x 7 = 56**

**8 x 8 = 64**

**8 x 9 = 72**

**8 x 10 = 80**

**--------------------**

**Multiplication Table for 9:**

**9 x 1 = 9**

**9 x 2 = 18**

**9 x 3 = 27**

**9 x 4 = 36**

**9 x 5 = 45**

**9 x 6 = 54**

**9 x 7 = 63**

**9 x 8 = 72**

**9 x 9 = 81**

**9 x 10 = 90**

**--------------------**

**Multiplication Table for 10:**

**10 x 1 = 10**

**10 x 2 = 20**

**10 x 3 = 30**

**10 x 4 = 40**

**10 x 5 = 50**

**10 x 6 = 60**

**10 x 7 = 70**

**10 x 8 = 80**

**10 x 9 = 90**

**10 x 10 = 100**

**--------------------**

**Multiplication Table for 11:**

**11 x 1 = 11**

**11 x 2 = 22**

**11 x 3 = 33**

**11 x 4 = 44**

**11 x 5 = 55**

**11 x 6 = 66**

**11 x 7 = 77**

**11 x 8 = 88**

**11 x 9 = 99**

**11 x 10 = 110**

**--------------------**

**Q-5. WAP to print factorial of given number**

**Ans-**

#include <stdio.h>

main()

{

int num;

unsigned long long factorial = 1; // Using unsigned long long to handle large factorial values

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

scanf("%d", &num);

if (num < 0)

{

printf("Factorial of a negative number doesn't exist.\n");

}

Else

{

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

{

factorial \*= i;

}

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

}

}

**Output:**

**Enter a number to calculate its factorial: 45**

**Factorial of 45 = 9649395409222631424**

**Q-6. WAP to print Fibonacci series up to given numbers**

**Ans-**

#include <stdio.h>

int main()

{

int n, i;

unsigned long long t1 = 0, t2 = 1, nextTerm;

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

scanf("%d", &n);

// Checking if the number of terms is valid

if (n <= 0)

{

printf("Please enter a positive integer.\n");

}

Else

{

printf("Fibonacci Series: ");

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

{

printf("%llu ", t1);

nextTerm = t1 + t2;

t1 = t2;

t2 = nextTerm;

}

printf("\n");

}

}

**Output:**

**Enter the number of terms: 10**

**Fibonacci Series: 0 1 1 2 3 5 8 13 21 34**

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

**Ans-**

#include <stdio.h>

int main()

{

int num, reverse = 0;

printf("Enter a number: ");

scanf("%d", &num);

// Reversing the number

while (num != 0)

{

reverse = reverse \* 10 + num % 10;

num /= 10;

}

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

}

**Output:**

**Enter a number: 4552**

**Reversed number = 2554**

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

**Ans-**

#include <stdio.h>

#include <stdlib.h> // for abs()

int main()

{

int num, maxDigit = 0;

printf("Enter a number: ");

scanf("%d", &num);

// Use the absolute value of the number to handle negative numbers

num = abs(num);

// Finding the maximum digit

while (num != 0)

{

int digit = num % 10;

if (digit > maxDigit)

{

maxDigit = digit;

}

num /= 10;

}

printf("Max digit is %d\n", maxDigit);

return 0;

}

**Output:**

**Enter a number: 23**

**Max digit is 3**

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

**Ans-**

#include <stdio.h>

#include <stdlib.h> // for abs()

int main()

{

int num, sum = 0;

printf("Enter a number: ");

scanf("%d", &num);

// Handling negative numbers

int original\_num = num;

num = abs(num);

// Summing the digits

while (num != 0)

{

sum += num % 10;

num /= 10;

}

// Restoring the sign of the sum based on the original number

if (original\_num < 0)

{

sum = -sum;

}

printf("Summation of the digits = %d\n", sum);

}

**Output:**

**Enter a number: 10**

**Summation of the digits = 1**

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

**Ans-**

#include <stdio.h>

#include <stdlib.h>

int main()

{

int num, firstDigit, lastDigit;

printf("Enter a number: ");

scanf("%d", &num);

// Handling negative numbers by taking the absolute value

int abs\_num = abs(num);

// Finding the last digit

lastDigit = abs\_num % 10;

// Finding the first digit

firstDigit = abs\_num;

while (firstDigit >= 10)

{

firstDigit /= 10;

}

// Calculating the sum of the first and last digits

int sum = firstDigit + lastDigit;

// If the original number was negative, make the sum negative

if (num < 0)

{

sum = -sum;

}

printf("Sum of the first and last digits = %d\n", sum);

}

**Output:**

**Enter a number: 45**

**Sum of the first and last digits = 9**

**Q-11.Accept 5 names from user at run time.**

**Ans-**

#include <stdio.h>

#include <string.h>

#define MAX\_NAMES 5

#define MAX\_LENGTH 100

int main()

{

char names[MAX\_NAMES][MAX\_LENGTH];

int i;

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

for (i = 0; i < MAX\_NAMES; i++)

{

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

fgets(names[i], MAX\_LENGTH, stdin);

size\_t len = strlen(names[i]);

if (len > 0 && names[i][len - 1] == '\n')

{

names[i][len - 1] = '\0';

}

}

printf("\nThe names you entered are:\n");

for (i = 0; i < MAX\_NAMES; i++)

{

printf("Name %d: %s\n", i + 1, names[i]);

}

}

**Output:**

**Enter 5 names:**

**Name 1: priya**

**Name 2: kanu**

**Name 3: janu**

**Name 4: sonu**

**Name 5: neha**

**The names you entered are:**

**Name 1: priya**

**Name 2: kanu**

**Name 3: janu**

**Name 4: sonu**

**Name 5: neha**

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

**Ans-**

#include <stdio.h>

#include <math.h>

int main()

{

int num, originalNum, remainder, n = 0, result = 0;

printf("Enter an integer: ");

scanf("%d", &num);

// Calculate the number of digits in the number

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

{

originalNum /= 10;

}

// Calculate the sum of the nth power of each digit

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

{

remainder = originalNum % 10;

result += pow(remainder, n);

}

if (result == num)

{

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

}

else

{

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

}

}

**Output:**

**Enter an integer: 45**

**45 is not an Armstrong number.**

**Enter an integer: 35**

**35 is not an Armstrong number.**

**---------------------------------------using while loop-------------------------------------------------**

#include <stdio.h>

#include <math.h>

int main()

{

int num, originalNum, remainder, n = 0, result = 0;

printf("Enter an integer: ");

scanf("%d", &num);

originalNum = num;

// Calculate the number of digits in the number

while (originalNum != 0)

{

originalNum /= 10;

n++;

}

originalNum = num;

// Calculate the sum of the nth power of each digit

while (originalNum != 0)

{

remainder = originalNum % 10;

result += pow(remainder, n);

originalNum /= 10;

}

// Check if the number is an Armstrong number

if (result == num)

{

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

}

else

{

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

}

}

**Output:**

**Enter an integer: 35**

**35 is not an Armstrong number.**

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

**Ans-**

#include <stdio.h>

int main()

{

int num;

unsigned long long factorial = 1;

printf("Enter a number: ");

scanf("%d", &num);

// Checking if the number is negative

if (num < 0)

{

printf("Factorial of a negative number.\n");

}

Else

{

int i = 1;

while (i <= num)

{

factorial \*= i;

i++;

}

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

}

}

**Output:**

**Enter a number: 12**

**Factorial of 12 = 479001600**

**Q-14 Accept 5 numbers from user and find those numbers factorials**

**Ans-**

#include <stdio.h>

unsigned long long factorial(int n)

{

if (n == 0 || n == 1)

return 1;

else

return n \* factorial(n - 1);

}

int main()

{

int numbers[5];

unsigned long long fact;

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

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

{

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

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

}

printf("\nFactorials of the entered numbers:\n");

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

{

fact = factorial(numbers[i]);

printf("%d! = %llu\n", numbers[i], fact);

}

}

**Output:**

**Enter 5 numbers:**

**Number 1: 45**

**Number 2: 25**

**Number 3: 36**

**Number 4: 78**

**Number 5: 96**

**Factorials of the entered numbers:**

**45! = 9649395409222631424**

**25! = 7034535277573963776**

**36! = 9003737871877668864**

**78! = 0**

**96! = 0**

**Q- 15.Calculate sum of 10 numbers using of while loop**

**Ans-**

#include <stdio.h>

int main()

{

int i = 1;

int count = 10; // Number of numbers to sum

int num;

int sum = 0;

printf("Enter %d numbers:\n", count);

while (i <= count)

{

printf("Enter number %d: ", i);

scanf("%d", &num);

sum += num;

i++;

}

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

}

**Output:**

**Enter 10 numbers:**

**Enter number 1: 12**

**Enter number 2: 14**

**Enter number 3: 57**

**Enter number 4: 14**

**Enter number 5: 21**

**Enter number 6: 34**

**Enter number 7: 16**

**Enter number 8: 48**

**Enter number 9: 67**

**Enter number 10: 12**

**Sum of the entered numbers = 295**

**Q- 16.Calculate the Sum of Natural Numbers Using the While Loop**

**Ans-**

#include <stdio.h>

int main()

{

int num;

int i = 1;

int sum = 0;

printf("Enter a positive integer: ");

scanf("%d", &num);

if (num <= 0)

{

printf(" Please enter a positive integer.\n");

return 1;

}

// Calculating the sum of natural numbers up to num

while (i <= num)

{

sum += i;

i++;

}

printf("Sum of natural numbers from 1 to %d = %d\n", num, sum);

}

**Output:**

**Enter a positive integer: 45**

**Sum of natural numbers from 1 to 45 = 1035**

**Enter a positive integer: 0**

**Please enter a positive integer.**

**Q-17 Calculate 5 numbers from user and calculate number of even and odd using of while loop**

**Ans-**

#include <stdio.h>

int main()

{

int count = 5;

int number;

int even\_count = 0;

int odd\_count = 0;

int i = 1;

printf("Enter %d numbers:\n", count);

while (i <= count)

{

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

scanf("%d", &number);

// Checking if the number is even or odd

if (number % 2 == 0)

{

even\_count++;

}

else

{

odd\_count++;

}

i++;

}

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

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

}

**Output:**

**Enter 5 numbers:**

**Number 1: 12**

**Number 2: 445**

**Number 3: 85**

**Number 4: 36**

**Number 5: 23**

**Count of even numbers: 2**

**Count of odd numbers: 3**

**Q-18 Write a C Program to Print the Multiplication Table of N**

1. **E.g. 5 \* 1 = 5**
2. **ii. 5 \* 2 = 10 1. . 2. .**
3. **iii. 5 \* 10 = 50**

**Ans-**

#include <stdio.h>

int main()

{

int n;

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

scanf("%d", &n);

printf("Multiplication Table of %d:\n", n);

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

{

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

}

}

**Output:**

**Enter a number to print its multiplication table: 45**

**Multiplication Table of 45:**

**45 \* 1 = 45**

**45 \* 2 = 90**

**45 \* 3 = 135**

**45 \* 4 = 180**

**45 \* 5 = 225**

**45 \* 6 = 270**

**45 \* 7 = 315**

**45 \* 8 = 360**

**45 \* 9 = 405**

**45 \* 10 = 450**

**Q-19. Patterns:**

**Ans-**

**1------------------**

#include<stdio.h>

int main()

{

int i, j, n=5;

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

{

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

{

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

}

printf("\n");

}

return 0;

}

**Output:**

**1**

**10**

**101**

**1010**

**10101**

**2------------------**

#include <stdio.h>

int main()

{

int rows = 5;

char n = 'A';

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

{

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

{

printf("%c ", n++);

}

printf("\n");

}

return 0;

}

**Output:**

**A**

**B C**

**D E F**

**G H I J**

**K L M N O**

**3------------------**

#include<stdio.h>

main()

{

int i=1,k,j;

while(i<=9) //raw

{

int k=1;

while(k<=9-i) //space

{

printf(" ");

k++;

}

for(j=1;j<=i;j++) //column

{

printf(" \*");

}

printf("\n");

i=i+2;

}

}

**Output:**

**\***

**\* \* \***

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

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

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

**4--------------------------------**

#include <stdio.h>

void main()

{

int i, j, rows=5;

for(i =1;i<=6;i++)

{

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

{

printf("\* ");

}

printf("\n");

}

for (i = rows; i > 0; i--)

{

for (j = i; j > 0; j--)

{

printf ("\* ");

}

printf ("\n");

}

}

**Output:**

**\***

**\* \***

**\* \* \***

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

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

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

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

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

**\* \* \***

**\* \***

**\***

**5--------------------------------**

#include <stdio.h>

int main()

{

int rows = 5;

int n = 1;

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

{

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

{

printf("%d ", n++);

}

printf("\n");

}

return 0;

}

**Output:**

**1**

**2 3**

**4 5 6**

**7 8 9 10**

**11 12 13 14 15**

**6--------------------------------**

#include <stdio.h>

int main()

{

int rows = 5;

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

{

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

{

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

}

printf("\n");

}

return 0;

}

**Output:**

**A**

**A B**

**A B C**

**A B C D**

**A B C D E**

**7-------------------------------**

#include <stdio.h>

#define SIZE 10

void generateSpiralMatrix(int matrix[SIZE][SIZE], int size)

{

int value = 1;

int minRow = 0, maxRow = size - 1;

int minCol = 0, maxCol = size - 1;

while (value <= size \* size)

{

for (int col = minCol; col <= maxCol && value <= size \* size; col++)

{

matrix[minRow][col] = value++;

}

minRow++;

for (int row = minRow; row <= maxRow && value <= size \* size; row++)

{

matrix[row][maxCol] = value++;

}

maxCol--;

for (int col = maxCol; col >= minCol && value <= size \* size; col--)

{

matrix[maxRow][col] = value++;

}

maxRow--;

for (int row = maxRow; row >= minRow && value <= size \* size; row--)

{

matrix[row][minCol] = value++;

}

minCol++;

}

}

void printMatrix(int matrix[SIZE][SIZE], int size)

{

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

{

for (int j = 0; j < size; j++)

{

printf("%3d ", matrix[i][j]);

}

printf("\n");

}

}

int main()

{

int matrix[SIZE][SIZE];

generateSpiralMatrix(matrix, SIZE);

printMatrix(matrix, SIZE);

return 0;

}

**Output:**

**1 2 3 4 5 6 7 8 9 10**

**36 37 38 39 40 41 42 43 44 11**

**35 64 65 66 67 68 69 70 45 12**

**34 63 84 85 86 87 88 71 46 13**

**33 62 83 96 97 98 89 72 47 14**

**32 61 82 95 100 99 90 73 48 15**

**31 60 81 94 93 92 91 74 49 16**

**30 59 80 79 78 77 76 75 50 17**

**29 58 57 56 55 54 53 52 51 18**

**28 27 26 25 24 23 22 21 20 19**

**Q- 20. WAP program to print below output using for loop**

**01 02 03 04 05 06 07 08 09 10**

**11 12 13 14 15 16 17 18 19 20**

**..............**

**..............**

**41 42 43 44 45 46 47 48 49 50**

**Ans-**

#include <stdio.h>

int main()

{

int count = 1;

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

{

for (int j = 0; j < 10; j++)

{

printf("%02d ", count); //02 is print 01...02...

count++;

}

printf("\n");

}

}

**Output:**

**01 02 03 04 05 06 07 08 09 10**

**11 12 13 14 15 16 17 18 19 20**

**21 22 23 24 25 26 27 28 29 30**

**31 32 33 34 35 36 37 38 39 40**

**41 42 43 44 45 46 47 48 49 50**

**Q- 22. Accept 3 numbers from user using while loop and check each numbers palindrome**

**Ans-**

#include <stdio.h>

int isPalindrome(int num)

{

int originalNum = num;

int reversedNum = 0;

// Reverse the number

while (num > 0)

{

int remainder = num % 10;

reversedNum = reversedNum \* 10 + remainder;

num /= 10;

}

// Check if the number is equal to its reverse

if (originalNum == reversedNum)

{

return 1; // Palindrome

}

else

{

return 0; // Not palindrome

}

}

int main() {

int n1, n2, n3;

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

scanf("%d %d %d", &n1, &n2, &n3);

printf("\nPalindrome Check:\n");

printf("%d: %s\n", n1, isPalindrome(n1) ? "Palindrome" : "Not Palindrome");

printf("%d: %s\n", n2, isPalindrome(n2) ? "Palindrome" : "Not Palindrome");

printf("%d: %s\n", n3, isPalindrome(n3) ? "Palindrome" : "Not Palindrome");

}

**Output:**

**Enter three numbers:**

**1**

**23**

**45**

**Palindrome Check:**

**1: Palindrome**

**23: Not Palindrome**

**45: Not Palindrome**

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

**Ans-**

#include <stdio.h>

int main()

{

int num, reversedNum = 0, remainder;

printf("Enter an integer: ");

scanf("%d", &num);

// Reversing the number using a for loop

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

{

remainder = num % 10;

reversedNum = reversedNum \* 10 + remainder;

}

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

}

**Output:**

**Enter an integer: 12**

**Reversed number: 21**

**Q- 24. 1 + 2 + 3 + 4 + 5 + ... + n**

**Ans-**

#include <stdio.h>

int main()

{

int n, sum = 0;

printf("Enter a positive integer n: ");

scanf("%d", &n);

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

{

sum += i; // Adding each number from 1 to n to sum

}

printf("Sum of the series 1 + 2 + ... + %d = %d\n", n, sum);

}

**Output:**

**Enter a positive integer n: 12**

**Sum of the series 1 + 2 + ... + 12 = 78**

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

**Ans-**

#include <stdio.h>

int main()

{

int n, sum = 0;

printf("Enter a positive integer n: ");

scanf("%d", &n);

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

{

sum += i \* i; // Adding square of each number from 1 to n to sum

}

printf("Sum of squares from 1\*1 to %d\*%d = %d\n", n, n, sum);

}

**Output:**

**Enter a positive integer n: 12**

**Sum of squares from 1\*1 to 12\*12 = 650**

**Q- 26. (1)+ (1+2) + (1+2+3) + (1+2+3+4) + ... + (1+2+3+4+...+n)**

**Ans-**

#include <stdio.h>

int main()

{

int n, sum = 0;

printf("Enter a positive integer n: ");

scanf("%d", &n);

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

{

int term\_sum = 0;

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

{

term\_sum += j;

}

sum += term\_sum; // Add term sum to overall sum

}

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

}

**Output:**

**Enter a positive integer n: 12**

**Sum of the series: 364**

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

**Ans-**

#include <stdio.h>

int main()

{

int n;

float sum = 0.0;

printf("Enter a positive integer n: ");

scanf("%d", &n);

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

{

if (i % 2 == 1)

{

// Odd: Add i / (i + 1)

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

}

else

{

// Even: Subtract i / (i + 1)

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

}

}

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

}

**Output:**

**Enter a positive integer n: 45**

**Sum of the series: 0.68**

**Q- 28. 1 2 3 6 9 18 27 54...**

**Ans-**

#include <stdio.h>

int main()

{

int n;

int current = 1;

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

scanf("%d", &n);

printf("Series: ");

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

{

printf("%d ", current);

if (i % 2 == 0)

{

current \*= 2; // Multiply by 2 for even indices

}

else

{

current \*= 3; // Multiply by 3 for odd indices

}

}

printf("\n");

}

**Output:**

**Enter the number of terms in the series: 12**

**Series: 1 2 6 12 36 72 216 432 1296 2592 7776 15552**

**Topics Covered**

**Function**

**Array**

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

**Ans-**

#include <stdio.h>

int findMax(int arr[], int size)

{

int max = arr[0]; // Assume the first element as maximum

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

{

if (arr[i] > max)

{

max = arr[i]; // Update max if current element is larger

}

}

return max; // Return the maximum element

}

int main()

{

int size;

printf("Enter the size of the array: ");

scanf("%d", &size);

int arr[size];

printf("Enter %d elements:\n", size);

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

{

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

}

// Call the function to find the maximum number

int maximum = findMax(arr, size);

printf("The maximum number in the array is: %d\n", maximum);

}

**Output:**

**Enter the size of the array: 4**

**Enter 4 elements:**

**12**

**23**

**12**

**12**

**The maximum number in the array is: 23**

**Q- 2. WAP of Addition, Subtraction, Multiplication and Division using Switch case.(Must Be Menu Driven)**

**Ans-**

#include<stdio.h>

main()

{

int ch,a,b;

printf("press 1 for addition");

printf("\npress 2 for substraction");

printf("\npress 3 for multipication");

printf("\npress 4 for exit");

while(1)

{

printf("\nenter choice");

scanf("%d",&ch);

if(ch==1)

{

printf("\n eneter number 1:");

scanf("%d",&a);

printf("\n eneter number 2:");

scanf("%d",&b);

printf("\n addition:%d",a+b);

}

else if(ch==2)

{

printf("\n eneter number 1:");

scanf("%d",&a);

printf("\n eneter number 2:");

scanf("%d",&b);

printf("\n subtrection:%d",a-b);

}

else if(ch==3)

{

printf("\n eneter number 1:");

scanf("%d",&a);

printf("\n eneter number 2:");

scanf("%d",&b);

printf("\n multiplication:%d",a\*b);

}

else

{

printf("thank you......");

break;

}

}

}

**Output:**

**press 1 for addition**

**press 2 for substraction**

**press 3 for multipication**

**press 4 for exit**

**enter choice1**

**eneter number 1:12**

**eneter number 2:12**

**addition:24**

**enter choice15**

**thank you......**

**Q- 3. WAP to find reverse of string using recursion**

**Ans-**

#include <stdio.h>

#include <string.h>

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

{

if (start >= end)

{

return;

}

// Swap characters at start and end positions

char temp = str[start];

str[start] = str[end];

str[end] = temp;

// Recursive call to reverse the substring

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

}

int main()

{

char str[100];

printf("Enter a string: ");

scanf("%s", str);

int len = strlen(str);

reverseString(str, 0, len - 1);

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

}

**Output:**

**Enter a string: 12**

**Reversed string: 21**

**Q- 4. WAP to find factorial using recursion**

**Ans-**

#include <stdio.h>

unsigned long long factorial(int n)

{

if (n == 0)

{

return 1;

}

else

{

return n \* factorial(n - 1);

}

}

int main()

{

int num;

printf("Enter a number: ");

scanf("%d", &num);

if (num < 0)

{

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

}

else

{

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

}

}

**Output:**

**Enter a number: 14**

**Factorial of 14 is 87178291200**

**Q- 5. WAP to take two Array input from user and sort them in ascending or descending order as per user’s choice**

**Ans-**

#include <stdio.h>

void inputArray(int arr[], int size);

void printArray(int arr[], int size);

void sortArray(int arr[], int size, char order);

int main()

{

int size1, size2;

char order;

printf("Enter the size of the first array: ");

scanf("%d", &size1);

int arr1[size1];

printf("Enter the size of the second array: ");

scanf("%d", &size2);

int arr2[size2];

printf("Enter elements of the first array:\n");

inputArray(arr1, size1);

printf("Enter elements of the second array:\n");

inputArray(arr2, size2);

printf("Enter 'a' for ascending order or 'd' for descending order: ");

scanf(" %c", &order);

// Sort the arrays

sortArray(arr1, size1, order);

sortArray(arr2, size2, order);

printf("Sorted first array:\n");

printArray(arr1, size1);

printf("Sorted second array:\n");

printArray(arr2, size2);

return 0;

}

// Function to input elements into an array

void inputArray(int arr[], int size)

{

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

{

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

}

}

// Function to print elements of an array

void printArray(int arr[], int size)

{

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

{

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

}

printf("\n");

}

// Function to sort an array in ascending or descending order

void sortArray(int arr[], int size, char order)

{

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

{

for (int j = 0; j < size - i - 1; j++)

{

if ((order == 'a' && arr[j] > arr[j + 1]) || (order == 'd' && arr[j] < arr[j + 1]))

{

int temp = arr[j];

arr[j] = arr[j + 1];

arr[j + 1] = temp;

}

}

}

}

**Output:**

**Enter the size of the first array: 2**

**Enter the size of the second array: 2**

**Enter elements of the first array:**

**36**

**34**

**Enter elements of the second array:**

**15**

**12**

**Enter 'a' for ascending order or 'd' for descending order: 352**

**Sorted first array:**

**36 34**

**Sorted second array:**

**15 12**

**Q- 6. WAP to make addition, Subtraction and multiplication of two matrix using 2-D Array**

**Ans-**

#include <stdio.h>

#define MAX 100

// Function prototypes

void inputMatrix(int matrix[MAX][MAX], int row, int col);

void printMatrix(int matrix[MAX][MAX], int row, int col);

void addMatrices(int matrix1[MAX][MAX], int matrix2[MAX][MAX], int result[MAX][MAX], int row, int col);

void subtractMatrices(int matrix1[MAX][MAX], int matrix2[MAX][MAX], int result[MAX][MAX], int row, int col);

void multiplyMatrices(int matrix1[MAX][MAX], int matrix2[MAX][MAX], int result[MAX][MAX], int row1, int col1, int col2);

int main() {

int row1, col1, row2, col2;

int matrix1[MAX][MAX], matrix2[MAX][MAX], result[MAX][MAX];

int choice;

// Input dimensions of the first matrix

printf("Enter rows and columns for the first matrix: ");

scanf("%d %d", &row1, &col1);

// Input dimensions of the second matrix

printf("Enter rows and columns for the second matrix: ");

scanf("%d %d", &row2, &col2);

// Ensure matrices are valid for addition and subtraction (same dimensions)

if (row1 != row2 || col1 != col2) {

printf("Error: Matrices dimensions must match for addition and subtraction.\n");

return -1;

}

// Ensure matrices are valid for multiplication (col1 == row2)

if (col1 != row2)

{

printf("Error: Number of columns in the first matrix must equal number of rows in the second matrix for multiplication.\n");

return -1;

}

// Input elements of the first matrix

printf("Enter elements of the first matrix:\n");

inputMatrix(matrix1, row1, col1);

// Input elements of the second matrix

printf("Enter elements of the second matrix:\n");

inputMatrix(matrix2, row2, col2);

// Menu for matrix operations

printf("Choose the operation:\n");

printf("1. Addition\n");

printf("2. Subtraction\n");

printf("3. Multiplication\n");

scanf("%d", &choice);

switch (choice) {

case 1:

addMatrices(matrix1, matrix2, result, row1, col1);

printf("Result of matrix addition:\n");

printMatrix(result, row1, col1);

break;

case 2:

subtractMatrices(matrix1, matrix2, result, row1, col1);

printf("Result of matrix subtraction:\n");

printMatrix(result, row1, col1);

break;

case 3:

multiplyMatrices(matrix1, matrix2, result, row1, col1, col2);

printf("Result of matrix multiplication:\n");

printMatrix(result, row1, col2);

break;

default:

printf("Invalid choice!\n");

}

return 0;

}

// Function to input elements into a matrix

void inputMatrix(int matrix[MAX][MAX], int row, int col) {

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

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

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

}

}

}

// Function to print elements of a matrix

void printMatrix(int matrix[MAX][MAX], int row, int col) {

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

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

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

}

printf("\n");

}

}

// Function to add two matrices

void addMatrices(int matrix1[MAX][MAX], int matrix2[MAX][MAX], int result[MAX][MAX], int row, int col) {

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

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

result[i][j] = matrix1[i][j] + matrix2[i][j];

}

}

}

// Function to subtract two matrices

void subtractMatrices(int matrix1[MAX][MAX], int matrix2[MAX][MAX], int result[MAX][MAX], int row, int col) {

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

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

result[i][j] = matrix1[i][j] - matrix2[i][j];

}

}

}

// Function to multiply two matrices

void multiplyMatrices(int matrix1[MAX][MAX], int matrix2[MAX][MAX], int result[MAX][MAX], int row1, int col1, int col2) {

for (int i = 0; i < row1; i++) {

for (int j = 0; j < col2; j++) {

result[i][j] = 0;

for (int k = 0; k < col1; k++) {

result[i][j] += matrix1[i][k] \* matrix2[k][j];

}

}

}

}

**Output:**

**Enter rows and columns for the first matrix: 12**

**12**

**Enter rows and columns for the second matrix: 12**

**46**

**ERROR!**

**Error: Matrices dimensions must match for addition and subtraction.**

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

Ans-

#include <stdio.h>

int stringLength(char str[]);

int main() {

char str[100];

printf("Enter a string: ");

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

int length = stringLength(str);

printf("Length of the string is: %d\n", length);

return 0;

}

int stringLength(char str[])

{

int length = 0;

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

{

length++;

}

// Subtract 1 if the last character is newline (from fgets)

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

length--;

}

return length;

}

**Output:**

**Enter a string: 12**

**Length of the string is: 2**

**Q- 8. WAP to reverse a string and check that the string is palindrome or not Write a program of structure employee that provides the following**

1. **information -print and display empno, empname, address**

**andage**

1. **Write a program of structure for five employee that**

**provides the following information -print and display**

**empno, empname, address andage**

**Ans-**

1. **information -print and display empno, empname, address**

**andage**

#include <stdio.h>

#include <string.h>

void reverseString(char str[], char reversed[]);

int isPalindrome(char str[]);

int main()

{

char str[100], reversed[100];

printf("Enter a string: ");

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

// Remove newline character if present

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

// Reverse the string

reverseString(str, reversed);

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

// Check if the string is a palindrome

if (isPalindrome(str))

{

printf("The string is a palindrome.\n");

}

else

{

printf("The string is not a palindrome.\n");

}

}

// Function to reverse a string

void reverseString(char str[], char reversed[])

{

int len = 0;

while (str[len] != '\0')

{

len++;

}

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

{

reversed[i] = str[len - 1 - i];

}

reversed[len] = '\0';

}

// Function to check if a string is a palindrome

int isPalindrome(char str[])

{

int len = 0;

while (str[len] != '\0')

{

len++;

}

for (int i = 0; i < len / 2; i++)

{

if (str[i] != str[len - 1 - i])

{

return 0;

}

}

return 1;

}

**Output:**

**Enter a string: 45**

**Reversed string: 54**

**The string is not a palindrome.**

1. **Write a program of structure for five employee that**

**provides the following information -print and display**

**empno, empname, address andage**

#include <stdio.h>

#define MAX 5

struct Employee

{

int empno;

char empname[100];

char address[100];

int age;

};

void inputEmployee(struct Employee \*emp);

void printEmployee(struct Employee emp);

int main()

{

struct Employee employees[MAX];

for (int i = 0; i < MAX; i++)

{

printf("Enter details for employee %d:\n", i + 1);

inputEmployee(&employees[i]);

}

printf("\nEmployee details:\n");

for (int i = 0; i < MAX; i++)

{

printEmployee(employees[i]);

}

return 0;

}

void inputEmployee(struct Employee \*emp)

{

printf("Enter employee number: ");

scanf("%d", &emp->empno);

printf("Enter employee name: ");

getchar();

fgets(emp->empname, sizeof(emp->empname), stdin);

emp->empname[strcspn(emp->empname, "\n")] = '\0';

printf("Enter employee address: ");

fgets(emp->address, sizeof(emp->address), stdin);

emp->address[strcspn(emp->address, "\n")] = '\0';

printf("Enter employee age: ");

scanf("%d", &emp->age);

}

void printEmployee(struct Employee emp) {

printf("Employee Number: %d\n", emp.empno);

printf("Employee Name: %s\n", emp.empname);

printf("Employee Address: %s\n", emp.address);

printf("Employee Age: %d\n\n", emp.age);

}

**Output:**

**Enter details for employee 1:**

**Enter employee number: 2**

**Enter employee name: priya**

**Enter employee address: abc**

**Enter employee age: 23**

**Enter details for employee 2:**

**Enter employee number: 7984658940**

**Enter employee name: mahi**

**Enter employee address: def**

**Enter employee age: 18**

**Enter details for employee 3:---------**

**Q- 9. WAP to show difference between Structure and Union.**

**Ans-**

#include <stdio.h>

struct MyStruct

{

int intValue;

float floatValue;

char charValue;

};

union MyUnion

{

int intValue;

float floatValue;

char charValue;

};

int main()

{

// Declare variables of structure and union types

struct MyStruct s;

union MyUnion u;

// Assign values to structure members

s.intValue = 42;

s.floatValue = 3.14f;

s.charValue = 'A';

// Print structure members

printf("Structure:\n");

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

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

printf("charValue: %c\n", s.charValue);

// Assign values to union members one by one

u.intValue = 42;

printf("\nUnion after assigning intValue:\n");

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

// Here, printing other union members may give unpredictable results

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

printf("charValue: %c\n", u.charValue);

u.floatValue = 3.14f;

printf("\nUnion after assigning floatValue:\n");

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

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

printf("charValue: %c\n", u.charValue);

u.charValue = 'A';

printf("\nUnion after assigning charValue:\n");

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

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

printf("charValue: %c\n", u.charValue);

return 0;

}

**Output:**

**Structure:**

**intValue: 42**

**floatValue: 3.14**

**charValue: A**

**Union after assigning intValue:**

**intValue: 42**

**floatValue: 0.00**

**charValue: \***

**Union after assigning floatValue:**

**intValue: 1078523331**

**floatValue: 3.14**

**charValue: �**

**Union after assigning charValue:**

**intValue: 1078523201**

**floatValue: 3.14**

**charValue: A**

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

**Ans-**

#include <stdio.h>

// Function prototype

int isPalindrome(int num);

int main()

{

int num;

printf("Enter a number: ");

scanf("%d", &num);

// Check if the number is a palindrome

if (isPalindrome(num))

{

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

}

else

{

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

}

}

// Function to check if a number is a palindrome

int isPalindrome(int num)

{

int originalNum = num;

int reversedNum = 0;

// Reverse the number using a for loop

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

{

int digit = num % 10;

reversedNum = reversedNum \* 10 + digit;

}

// Check if the original number is equal to the reversed number

return originalNum == reversedNum;

}

**Output:**

**Enter a number: 7**

**7 is a palindrome.**

**Enter a number: 56**

**56 is not a palindrome.**

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

**Ans-**

#include <stdio.h>

int main()

{

int numbers[5];

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

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

{

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

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

}

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

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

{

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

}

}

**Output:**

**Enter 5 numbers:**

**Number 1: 45**

**Number 2: 25**

**Number 3: 36**

**Number 4: 76**

**Number 5: 28**

**Numbers in reverse order:**

**28**

**76**

**36**

**25**

**45**

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

**Ans-**

#include <stdio.h>

int main()

{

char names[5][100];

printf("Enter the names of 5 students:\n");

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

{

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

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

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

}

printf("\nThe names of the students are:\n");

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

{

printf("Student %d: %s\n", i + 1, names[i]);

}

}

**Output:**

**Enter the names of 5 students:**

**Name of student 1: priya**

**Name of student 2: mahi**

**Name of student 3: neha**

**Name of student 4: janu**

**Name of student 5: sonu**

**The names of the students are:**

**Student 1: priya**

**Student 2: mahi**

**Student 3: neha**

**Student 4: janu**

**Student 5: sonu**

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

**Ans-**

#include <stdio.h>

int main() {

int numbers[5];

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

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

{

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

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

}

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

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

{

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

{

printf("Number %d (%d) is even.\n", i + 1, numbers[i]);

}

else

{

printf("Number %d (%d) is odd.\n", i + 1, numbers[i]);

}

}

}

**Output:**

**Enter 5 numbers:**

**Number 1: 12**

**Number 2: 78**

**Number 3: 36**

**Number 4: 15**

**Number 5: 95**

**Checking if the numbers are even or odd:**

**Number 1 (12) is even.**

**Number 2 (78) is even.**

**Number 3 (36) is even.**

**Number 4 (15) is odd.**

**Number 5 (95) is odd.**

**Q- 14.Perform 2D matrix array**

#include <stdio.h>

#define ROWS 3

#define COLS 3

// Function prototypes

void inputMatrix(int matrix[ROWS][COLS]);

void displayMatrix(int matrix[ROWS][COLS]);

void transposeMatrix(int matrix[ROWS][COLS], int transpose[COLS][ROWS]);

int main() {

int matrix[ROWS][COLS];

int transpose[COLS][ROWS];

printf("Enter elements of %dx%d matrix:\n", ROWS, COLS);

inputMatrix(matrix);

printf("\nOriginal Matrix:\n");

displayMatrix(matrix);

// Transpose the matrix

transposeMatrix(matrix, transpose);

printf("\nTransposed Matrix:\n");

displayMatrix(transpose);

}

// Function to input elements into a matrix

void inputMatrix(int matrix[ROWS][COLS])

{

for (int i = 0; i < ROWS; i++)

{

for (int j = 0; j < COLS; j++)

{

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

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

}

}

}

// Function to display elements of a matrix

void displayMatrix(int matrix[ROWS][COLS])

{

for (int i = 0; i < ROWS; i++)

{

for (int j = 0; j < COLS; j++)

{

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

}

printf("\n");

}

}

// Function to transpose a matrix

void transposeMatrix(int matrix[ROWS][COLS], int transpose[COLS][ROWS])

{

for (int i = 0; i < ROWS; i++)

{

for (int j = 0; j < COLS; j++)

{

transpose[j][i] = matrix[i][j];

}

}

}

**Output:**

**Enter elements of 3x3 matrix:**

**Enter element [1][1]: 12**

**Enter element [1][2]: 36**

**Enter element [1][3]: 7**

**Enter element [2][1]: 3**

**Enter element [2][2]: 65**

**Enter element [2][3]: 18**

**Enter element [3][1]: 32**

**Enter element [3][2]: 54**

**Enter element [3][3]: 36**

**Original Matri:**

**12 36 7**

**3 65 18**

**32 54 36**

**Transposed Matrix:**

**12 3 32**

**36 65 54**

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

**Ans-**

#include <stdio.h>

void bubbleSort(int array[], int size);

int main()

{

int numbers[5];

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

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

{

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

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

}

bubbleSort(numbers, 5);

printf("\nSorted numbers in ascending order:\n");

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

{

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

}

}

void bubbleSort(int array[], int size)

{

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

{

for (int j = 0; j < size - 1 - i; j++)

{

if (array[j] > array[j + 1])

{

// Swap elements if they are in the wrong order

int temp = array[j];

array[j] = array[j + 1];

array[j + 1] = temp;

}

}

}

}

**Output:**

**Enter 5 numbers:**

**Number 1: 12**

**Number 2: 36**

**Number 3: 45**

**Number 4: 84**

**Number 5: 36**

**Sorted numbers in ascending order:**

**12**

**36**

**36**

**45**

**84**

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

**Ans-**

#include <stdio.h>

int main()

{

int numbers[5];

int sum = 0;

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

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

{

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

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

}

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

{

sum += numbers[i];

}

printf("\nSum of the 5 numbers: %d\n", sum);

}

**Output:**

**Enter 5 numbers:**

**Number 1: 1**

**Number 2: 2**

**Number 3: 3**

**Number 4: 4**

**Number 5: 5**

**Sum of the 5 numbers: 15**

**Q- 17.WAP to show difference between Structure and Union.**

**Ans-**

**Structure:**

struct Data

{  
   int a;  
   long int b;  
}

data, data1;

In this example, the Data structure has two members: an of type ‘int’ and ‘b’ of type long ‘int’. The variables ‘data’ and ‘data’1 are objects of the Data structure.

**Union:**

union Data

{  
   int i;  
   float f;  
}

data, data1;

In this example, we define a union named Data with two members: ‘int’ ‘i’ and float ‘f’. We can then create objects of the union, such as ‘data’ and ‘data1’, to store and manipulate data of either ‘int’ or ‘float’ type.

**Topics Covered**

**String**

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

**Ans-**

#include <stdio.h>

int main()

{

char str[100];

int length = 0;

printf("Enter a string: ");

scanf("%[^\n]", str);

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

{

length++;

}

printf("Length of the string: %d\n", length);

}

**Output:**

**Enter a string: hello!my name is priya**

**Length of the string: 22**

**Q- 2. Write a program in C to separate individual characters from a string.**

**Ans-**

#include <stdio.h>

int main()

{

char str[100];

printf("Enter a string: ");

scanf("%[^\n]", str);

printf("Individual characters:\n");

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

{

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

}

}

**Output:**

**Enter a string: priya**

**Individual characters:**

**p**

**r**

**i**

**y**

**a**

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

**Ans-**

#include <stdio.h>

#include <string.h>

int main()

{

char str[100];

printf("Enter a string: ");

scanf("%[^\n]", str);

// Calculate the length of the string

int length = strlen(str);

printf("Individual characters in reverse order:\n");

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

{

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

}

}

**Output:**

**Enter a string: hello**

**Individual characters in reverse order:**

**o**

**l**

**l**

**e**

**h**

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

**Ans-**

#include <stdio.h>

int main()

{

char str[1000];

int wordCount = 0;

int i;

printf("Enter a string: ");

scanf("%[^\n]", str);

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

{

// Check for the beginning of a word

if (str[i] != ' ' && str[i] != '\t' && str[i] != '\n')

{

wordCount++;

// Skip to the end of the current word

while (str[i] != ' ' && str[i] != '\t' && str[i] != '\n' && str[i] != '\0')

{

i++;

}

}

}

printf("Total number of words in the string: %d\n", wordCount);

}

**Output:**

**Enter a string: priyapatel**

**Total number of words in the string: 2**

**Enter a string: priya patel**

**Total number of words in the string: 3**

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

**Ans-**

#include <stdio.h>

int compareStrings(char str1[], char str2[]);

int main()

{

char str1[1000], str2[1000];

printf("Enter the first string: ");

scanf("%[^\n]", str1);

// Clear input buffer

while(getchar() != '\n');

printf("Enter the second string: ");

scanf("%[^\n]", str2);

// Compare the strings and print the result

if (compareStrings(str1, str2) == 0)

{

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

}

else

{

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

}

}

int compareStrings(char str1[], char str2[])

{

int i = 0;

// Iterate through each character of both strings

while (str1[i] == str2[i])

{

if (str1[i] == '\0') // If end of string is reached

return 0;

i++;

}

// Strings differ at position i, compare ASCII values

if (str1[i] < str2[i])

return -1; // str1 is lexicographically smaller

else

return 1; // str2 is lexicographically smaller

}

**Output:**

**Enter the first string: priya**

**Enter the second string: patel**

**Strings are not equal.**

**Enter the first string: priya**

**Enter the second string: priya**

**Strings are equal.**

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

**Ans-**

#include <stdio.h>

#include <ctype.h> // For isalpha(), isdigit()

int main()

{

char str[1000];

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

printf("Enter a string: ");

scanf("%[^\n]", str);

// Iterate through each character of the string

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

{

if (isalpha(str[i]))

{

alphabets++;

} else if (isdigit(str[i]))

{

digits++;

}

else

{

specials++;

}

}

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

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

printf("Total special characters: %d\n", specials);

}

**Output:**

**Enter a string: hello!1.i am priya**

**Total alphabets: 13**

**Total digits: 1**

**Total special characters: 4**

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

**Ans-**

#include <stdio.h>

void stringCopy(char source[], char destination[]);

int main()

{

char source[1000], destination[1000];

printf("Enter a string: ");

scanf("%[^\n]", source);

stringCopy(source, destination);

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

}

// Function to copy one string to another

void stringCopy(char source[], char destination[])

{

int i = 0;

// Copy each character until end of source string is reached

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

{

destination[i] = source[i];

i++;

}

// Add null character at the end of destination string

destination[i] = '\0';

}

**Output:**

**Enter a string: priya**

**Copied string: Priya**

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

**Ans-**

#include <stdio.h>

#include <ctype.h>

int main()

{

char str[1000];

int vowels = 0, consonants = 0, i;

printf("Enter a string: ");

scanf("%[^\n]", str);

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

{

str[i] = tolower(str[i]);

}

// Iterate through each character of the string

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

{

// Check if the current character is an alphabet

if (isalpha(str[i]))

{

// Check if it is a vowel

if (str[i] == 'a' || str[i] == 'e' || str[i] == 'i' ||

str[i] == 'o' || str[i] == 'u')

{

vowels++;

}

else

{

consonants++;

}

}

}

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

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

}

**Output:**

**Enter a string: priya patel**

**Total vowels: 4**

**Total consonants: 6**

**Q- 9. Write a program in C to find the maximum number of characters in a string.**

**Ans-**

#include <stdio.h>

int main()

{

char str[1000];

int length = 0, i;

printf("Enter a string: ");

scanf("%[^\n]", str);

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

{

length++;

}

printf("Maximum number of characters: %d\n", length);

}

**Output:**

**Enter a string: priya**

**Maximum number of characters: 5**

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

**Ans-**

#include <stdio.h>

#include <string.h>

void substring(char \*source, char \*destination, int start, int length)

{

strncpy(destination, source + start, length);

destination[length] = '\0';

}

int main()

{

char str[100], substr[100];

int start, length;

printf("Enter the main string: ");

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

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

printf("Enter the starting position: ");

scanf("%d", &start);

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

scanf("%d", &length);

int str\_len = strlen(str);

if (start < 0 || start >= str\_len || start + length > str\_len)

{

printf("Invalid starting position or length.\n");

}

else

{

substring(str, substr, start, length);

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

}

return 0;

}

**Output:**

**Enter the main string: 78**

**Enter the starting position: 32**

**Enter the length of the substring: 23**

**Invalid starting position or length.**

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

**Ans-**

#include <stdio.h>

#include <ctype.h>

int main()

{

char sentence[1000];

int i;

printf("Enter a sentence: ");

scanf("%[^\n]", sentence);

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

{

if (islower(sentence[i]))

{

sentence[i] = toupper(sentence[i]);

}

else if (isupper(sentence[i]))

{

sentence[i] = tolower(sentence[i]);

}

}

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

}

**Output:**

**Enter a sentence: hello...my name is priya**

**Modified sentence: HELLO...MY NAME IS PRIYA**

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

**Ans-**

#include <stdio.h>

#include <string.h>

int countOccurrences(char str[], char word[]);

int main()

{

char sentence[1000];

char word[] = "is";

int count;

printf("Enter a sentence: ");

scanf("%[^\n]", sentence);

count = countOccurrences(sentence, word);

printf("Number of times '%s' appears in the sentence: %d\n", word, count);

}

int countOccurrences(char str[], char word[])

{

int i, j, count, wordLen, strLen;

wordLen = strlen(word);

strLen = strlen(str);

count = 0;

for (i = 0; i <= strLen - wordLen; i++)

{

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

{

if (str[i + j] != word[j])

{

break;

}

}

if (j == wordLen)

{

count++;

}

}

return count;

}

**Output:**

**Enter a sentence: my name is priya patel**

**Number of times 'is' appears in the sentence: 1**

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

**Ans-**

#include <stdio.h>

#include <ctype.h>

void removeNonAlphabetic(char source[], char result[]);

int main()

{

char original[1000], result[1000];

printf("Enter a string: ");

scanf("%[^\n]", original);

removeNonAlphabetic(original, result);

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

}

void removeNonAlphabetic(char source[], char result[])

{

int i, j;

for (i = 0, j = 0; source[i] != '\0'; i++)

{

if (isalpha(source[i]))

{

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

}

}

result[j] = '\0';

}

**Output:**

**Enter a string: priya**

**String with only alphabetic characters: Priya**

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

**Ans-**

#include <stdio.h>

void combineStrings(char str1[], char str2[], char result[]);

int main()

{

char str1[1000], str2[1000], result[2000];

printf("Enter the first string: ");

scanf("%[^\n]", str1);

getchar();

printf("Enter the second string: ");

scanf("%[^\n]", str2);

combineStrings(str1, str2, result);

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

}

void combineStrings(char str1[], char str2[], char result[])

{

int i, j;

for (i = 0; str1[i] != '\0'; i++)

{

result[i] = str1[i];

}

for (j = 0; str2[j] != '\0'; j++)

{

result[i + j] = str2[j];

}

result[i + j] = '\0';

}

**Output:**

**Enter the first string: priya**

**Enter the second string: patel**

**Combined string: priyapatel**

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

**Ans-**

#include <stdio.h>

#include <string.h>

#include <ctype.h>

#define MAX\_LENGTH 1000

void findLargestAndSmallestWords(char \*str, char \*largest, char \*smallest)

{

int maxLen = 0, minLen = MAX\_LENGTH;

char \*word = strtok(str, " ");

while (word != NULL)

{

int len = strlen(word);

if (len > maxLen)

{

maxLen = len;

strcpy(largest, word);

}

if (len < minLen)

{

minLen = len;

strcpy(smallest, word);

}

word = strtok(NULL, " ");

}

}

int main()

{

char input[MAX\_LENGTH];

char largest[MAX\_LENGTH], smallest[MAX\_LENGTH];

printf("Enter a string: ");

fgets(input, MAX\_LENGTH, stdin);

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

findLargestAndSmallestWords(input, largest, smallest);

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

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

return 0;

}

**Output:**

**Enter a string: hi..my name is priya......**

**Largest word: priya......**

**Smallest word: is**