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Department : CSE

Examination No : 286128

Subject : Programming in C/C++ Assignment.

**1) Basic Concepts:**

**1.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

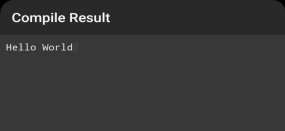
clrscr();

printf("Hello World");

getch();

}

**Output:**

****

**2.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int a=5,b=6;

clrscr();

printf("Addition, %d+%d=%d",a,b,a+b);

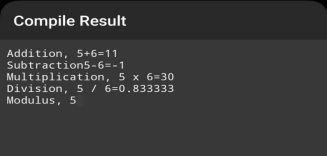
printf("\nSubtraction%d-%d=%d",a,b,a-b);

printf("\nMultiplication, %d x %d=%d",a,b,a\*b); printf("\nDivision, %d / %d=%f",a,b,(float)a/(float)b); printf("\nModulus, %d",a%b);

getch();

}

**Output:**

****

**3.**

**Code:**

#include<stdio.h>

#include<conio.h>

#include<math.h>

void main()

{

float a,b;

clrscr();

printf("Enter the value of first decimal no.:"); scanf("%f",&a);

printf("Enter the value of second decimal no.:");

scanf("%f",&b);

printf("Addition=%.3f",a+b);

printf("\nSubtraction=%.3f",a-b);

printf("\nMultiplication=%.3f",a\*b);

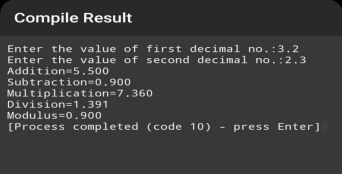
printf("\nDivision=%.3f",a/b);

printf("\nModulus=%.3f",fmod(a,b));

getch();

}

**Output:**

****

**4.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

float amount;

int rupee, paise;

clrscr();

printf("Enter Amount in decimal:");

scanf("%f",&amount);

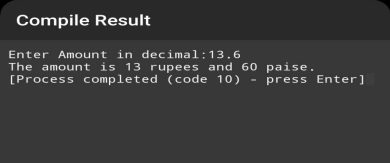
rupee=(int)amount;

paise=(amount-rupee)\*100;

printf("The amount is %d rupees and %d paise.",rupee,paise); getch();

}

**Output:**

****

**5.**

**Code:**

**Output:**

**6.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int days,months,daysR;

clrscr();

printf("Enter No. of days:");

scanf("%d",& days);

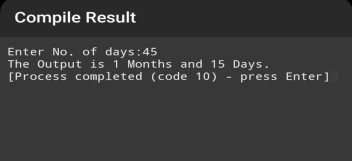
months=days/30;

daysR=days %30;

printf("The Output is %d Months and %d Days.", months, daysR); getch();

}

**Output:**

****

**7(a).**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

float Celsius, Fahrenheit;

clrscr();

printf("Enter Temperature in Celsius:");

scanf("%f",& Celsius);

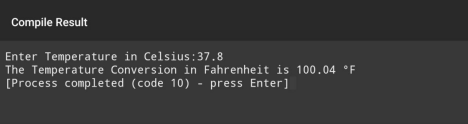
Fahrenheit=1.8\*Celsius+32;

printf("The Temperature Conversion in Fahrenheit is %.2f °F", Fahrenheit);

getch();

}

**Output:**

****

**7(b).**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

float Celsius, Fahrenheit;

clrscr();

printf("Enter Temperature in Fahrenheit:");

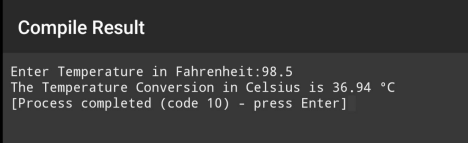
scanf("%f",& Fahrenheit);

Celsius=(Fahrenheit-32)/1.8;

printf("The Temperature Conversion in Celsius is %.2f °C", Celsius); getch();

}

**Output:**

****

**8.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

short z;

int x, y;

clrscr();

printf("Enter value of x and y(6 digit):");

scanf("%d%d",&x,&y);

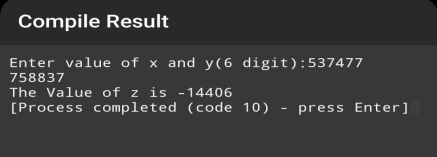
z=x+y;

printf("The Value of z is %d",z);

getch();

}

**Output:**

****

**9.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

short num = 1;

int i;

clrscr();

for (i = 0; i < 16; i++)

{

printf("%hd\n", num);

num \*= 2;

}

getch();

}

**Output:**

****

**10(a).**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int x, y, z;

clrscr();

printf("Enter No. (1):");

scanf("%d",&x);

printf("Enter No. (2):");

scanf("%d",&y);

printf("Before Swaping:\n");

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

printf("%d",y);

z=x;

x=y;

y=z;

printf("After Swaping:\n");

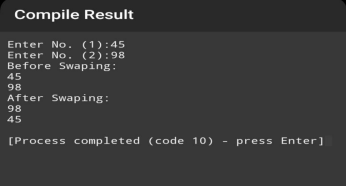
printf("%d\n",x);

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

getch();

}

**Output:**

****

**10(b).**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int x, y;

clrscr();

printf("Enter No. (1):");

scanf("%d",&x);

printf("Enter No. (2):");

scanf("%d",&y);

printf("\nBefore Swaping:\n");

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

printf("%d",y);

x=x+y;

y=x-y;

x=x-y;

printf("\nAfter Swaping:\n");

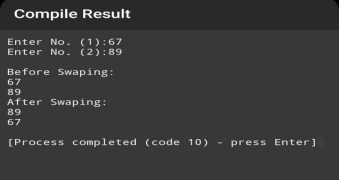
printf("%d\n",x);

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

getch();

}

**Output:**

****

**11.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int a;

float b;

char c;

double d;

short e;

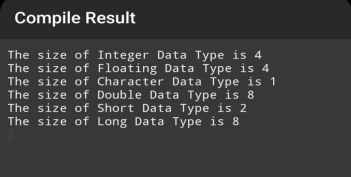
long f;

clrscr();

printf("The size of Integer Data Type is %d\n",sizeof(a)); printf("The size of Floating Data Type is %d\n",sizeof(b)); printf("The size of Character Data Type is %d\n",sizeof(c)); printf("The size of Double Data Type is %d\n",sizeof(d)); printf("The size of Short Data Type is %d\n",sizeof(e)); printf("The size of Long Data Type is %d\n",sizeof(f)); getch();

}

**Output:**

****

**12.**

**Code:**

#include<stdio.h>

#include<conio.h>

enum Direction

{

NORTH = 1,

EAST,

SOUTH,

WEST

};

void main()

{

enum Direction dir = EAST;

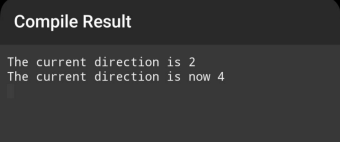
clrscr();

printf("The current direction is %d\n", dir); dir = WEST;

printf("The current direction is now %d\n", dir); getch();

}

**Output:**

****

**13.**

**Code:**

#include<stdio.h>

#include<conio.h>

typedef unsigned int uint;

void main()

{

uint x = 42;

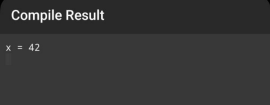
clrscr();

printf("x = %u\n", x);

getch();

}

**Output:**

****

**14.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

float a,b,c,x;

fflush(stdin);

clrscr();

printf("Enter the value of a:\n"); scanf("%f",&a);

printf("Enter the value of b:\n"); scanf("%f",&b);

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

scanf("%f",&c);

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

scanf("%f",&x);

printf("a. = %f\n",a-b/3+c\*2-1);

printf("b. = %f\n",a-b/(3+c)\*(2-1));

printf("c. = %f\n",a-(b/(3+c)\*2)-1);

printf("d. = %f\n", 3\*a\*a + 2\*a + 1);

printf("e. = %f\n",2\*x\*x/a+9\*x/8+1);

printf("f. = %f",a\*a+263\*b/296+8\*b\*b+963\*a/296); getch();

}

**Output:**

****

**15.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

float radius,volume;

clrscr();

printf("Enter Value of Radius of sphere(cm):");

scanf("%f",&radius);

volume= 1.34\*3.14\*radius\*radius\*radius;

printf("The Volume of Sphere of Radius %.2f cm is %.2f cm

cube.",radius,volume);

getch();

}

**Output:**

****

**16.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int a;

clrscr();

printf("Enter Number:");

scanf("%d",&a);

printf("%d is Multiplication by 2.\n",a<<1);

printf("%d is Division by 2.",a>>1);

getch();

}

**Output:**

****

**------------------------------------------------------------------------------------ 2) Operators And Expressions.**

**1.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int x,y,z,num,s;

clrscr();

printf("Enter any 3 digit number:");

scanf("%d",&num);

x=num/100;

y=(num/10)%10;

z=num%10;

s=x+y+z;

printf("First Digit : %d\n",x);

printf("Second Digit : %d\n",y);

printf("Third Digit : %d\n",z);

printf("Sum of three digits is %d",s);

getch();

}

**Output:**

****

**2.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int days,months,daysR;

clrscr();

printf("Enter No. of days:");

scanf("%d",& days);

months=days/30;

daysR=days %30;

printf("The Output is %d Months and %d Days.", months, daysR); getch();

}

**Output:**

****

**3.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int a,b,max;

clrscr();

printf("Enter Two numbers:");

scanf("%d%d",&a,&b);

max= (a>b)?a:b;

printf("The maximum number among %d and %d is %d",a,b,max); getch();

}

**Output:**

****

**4.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int a,b,c,max;

clrscr();

printf("Enter Three numbers:");

scanf("%d%d%d",&a,&b,&c);

max= (a>b)?((a>c)?a:c):((b>c)?b:c);

printf("The maximum number among %d, %d and %d is %d",a,b,c,max); getch();

}

**Output:**

****

**5.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int a;

float b;

char c;

double d;

long e;

clrscr();

printf("The size of Integer Data Type is: %d\n",sizeof(a)); printf("The size of Floating Data Type is: %d\n",sizeof(b)); printf("The size of Character Data Type is: %d\n",sizeof(c)); printf("The size of Double Data Type is: %d\n",sizeof(d));

printf("The size of Long Data Type is: %d\n",sizeof(e)); getch();

}

**Output:**

****

**6.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int x=7, y=9;

clrscr();

printf("a) Z = %d\n",x++ + ++y - x-- + --y); x=5;

y=2;

printf("b) Z = %d\n",x++ \* y++ / ++x - --y % x++); getch();

}

**Output:**

****

**3) Decision Making & Branching (Control Structures)**

**1(a).**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int a;

clrscr();

printf("Enter any number:");

scanf("%d",&a);

if(a%2==0)

{

printf("%d is a Even Number.",a);

}

else

{

printf("%d is a Odd Number.",a);

}

getch();

}

**Output:**

****

**1(b).**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int year;

clrscr();

printf("Enter Year:");

scanf("%d",&year);

if(year%4==0)

{

printf("%d is a Leap Year",year);

}

else

{

printf("%d is not a Leap Year",year);

}

getch();

}

**Output:**

****

**1(c).**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int age;

clrscr();

printf("Enter Age:");

scanf("%d",&age);

if(age>=18)

{

printf("You are elligible to vote.");

}

else

{

printf("You are not elligible to vote."); }

getch();

}

**Output:**

****

**2.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int a;

clrscr();

printf("Enter any number:");

scanf("%d",&a);

if(a>0)

{

printf("The number is Positive.");

}

else if(a<0)

{

printf("The number is Negative.");

}

else if(a==0)

{

printf("It is equal to ZERO!!");

}

else

{

printf("Invalid Choice!!!");

}

getch();

}

**Output:**

****

**3.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

char ch;

// read a character from the user

printf("Enter a character: ");

scanf("%c", &ch);

// print the ASCII value of the character

printf("ASCII value of %c is %d\n", ch, ch);

// check if the character is uppercase and convert to lowercase if (ch >= 'A' && ch <= 'Z')

{

ch += 32; // ASCII value difference between uppercase and lowercase

printf("Lowercase of %c is %c\n", ch-32, ch);

}

// check if the character is lowercase and convert to uppercase else if (ch >= 'a' && ch <= 'z')

{

ch -= 32; // ASCII value difference between lowercase and uppercase

printf("Uppercase of %c is %c\n", ch+32, ch);

}

// check if the character is a vowel or not

switch (ch)

{

case 'a':

case 'e':

case 'i':

case 'o':

case 'u':

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

break;

case 'A':

case 'E':

case 'I':

case 'O':

case 'U':

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

break;

default:

printf("%c is not a vowel.\n", ch);

}

getch();

}

**Output:**

****

**4.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

char ch;

clrscr();

// read a character from the user

printf("Enter a character: ");

scanf("%c", &ch);

// check if the character is a number

if (ch >= '0' && ch <= '9')

{

printf("It is a number.\n");

}

// check if the character is an alphabet

else if ((ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z')) {

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

// check if the alphabet is uppercase or lowercase

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

{

printf("It is a lowercase alphabet. ");

// check if the alphabet is a vowel

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

{

printf("It is a vowel.\n");

}

else

{

printf("It is not a vowel.\n");

}

}

else

{

printf("It is an uppercase alphabet.\n");

if (ch == 'A' || ch == 'E' || ch == 'I' || ch == 'O' || ch == 'U')

{

printf("It is a vowel.\n");

}

else

{

printf("It is not a vowel.\n");

}

}

}

// check if the character is a special character else

{

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

getch();

}

**Output:**

****

**5.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int a,b,c;

float avg;

clrscr();

printf("Enter value of any three numbers:"); scanf("%d%d%d",&a,&b,&c);

avg=(a+b+c)/3;

printf("Average is %.1f.\n",avg); if(a>b)

{

if(a<c)

{

printf("%d is maximum\n",c);

}

else

{

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

}

}

if(b>a)

{

if(b<c)

{

printf("%d is maximum\n",c);

}

else

{

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

}

}

if(a<b)

{

if(a>c)

{

printf("%d is minimum",c);

}

else

{

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

}

}

if(b<a)

{

if(b>c)

{

printf("%d is minimum",c);

}

else

{

printf("%d is minimum",b);

}

}

getch();

}

**Output:**

****

**6.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int a,b,c,d,num,deno;

clrscr();

printf("Enter values of a,b,c,d:");

scanf("%d%d%d%d",&a,&b,&c,&d);

printf("Substituting the values in eqn of ratio: (a+b)/(c-d)\n"); num=a+b;

deno=c-d;

if(deno==0)

{

printf("Ratio cannot be calculated since (c-d)=0.");

}

else

{

printf("The Ratio is : %d",num/deno);

}

getch();

}

**Output:**

****

**7.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int a,b,ch1,ch;

clrscr();

printf("This is a calculator ;)\n");

printf("Please select the way to calculate:\n");

printf("Enter 1 to calculate with if-else syntax.\n"); printf("Enter 2 to calculate with switch-case syntax.\n"); scanf("%d",&ch1);

if(ch1==1)

{

printf("Enter 1 to Add two numbers:\n");

printf("Enter 2 to Subtract two numbers:\n");

printf("Enter 3 to Multiply two numbers:\n");

printf("Enter 4 to Divide two numbers:\n");

printf("Enter 5 to get Remainder of two numbers:\n"); scanf("%d",&ch);

if(ch==1)

{

printf("Enter Two Numbers:");

scanf("%d%d",&a,&b);

printf("The Addition is %d + %d = %d",a,b,a+b);

}

else if(ch==2)

{

printf("Enter Two Numbers:");

scanf("%d%d",&a,&b);

printf("The Subtraction is %d - %d = %d",a,b,a-b);

}

else if(ch==3)

{

printf("Enter Two Numbers:");

scanf("%d%d",&a,&b);

printf("The Multiplication is %d x %d = %d",a,b,a\*b);

}

else if(ch==4)

{

printf("Enter Two Numbers:");

scanf("%d%d",&a,&b);

printf("The Division is %d / %d = %d",a,b,a/b);

}

else if(ch==5)

{

printf("Enter Two Numbers:");

scanf("%d%d",&a,&b);

printf("The Remainder is %d",a%b);

}

else

{

printf("Invalid Choice!!");

}

}

else

{

printf("Enter 1 to Add two numbers:\n");

printf("Enter 2 to Subtract two numbers:\n");

printf("Enter 3 to Multiply two numbers:\n");

printf("Enter 4 to Divide two numbers:\n");

printf("Enter 5 to get Remainder of two numbers:\n"); scanf("%d",&ch);

switch(ch)

{

case 1:

{

printf("Enter Two Numbers:");

scanf("%d%d",&a,&b);

printf("The Addition is %d + %d = %d",a,b,a+b);

break;

}

case 2:

{

printf("Enter Two Numbers:");

scanf("%d%d",&a,&b);

printf("The Subtraction is %d - %d = %d",a,b,a-b);

break;

}

case 3:

{

printf("Enter Two Numbers:");

scanf("%d%d",&a,&b);

printf("The Multiplication is %d x %d =

%d",a,b,a\*b);

break;

}

case 4:

{

printf("Enter Two Numbers:");

scanf("%d%d",&a,&b);

printf("The Division is %d / %d = %d",a,b,a/b);

break;

}

case 5:

{

printf("Enter Two Numbers:");

scanf("%d%d",&a,&b);

printf("The Remainder is %d % %d = %d",a,b,a%b);

break;

}

default:

{

printf("Invalid Choice!!");

}

}

}

getch();

}

**Output:**

****

**8.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int sub1, sub2, sub3, sub4;

float total, aggregate;

// Get marks in four subjects from user

printf("Enter marks in four subjects:\n"); scanf("%d%d%d%d", &sub1, &sub2, &sub3, &sub4);

// Calculate total marks and aggregate percentage total = sub1 + sub2 + sub3 + sub4;

aggregate = total / 4.0;

// Display the total and aggregate

printf("Total marks: %.2f\n", total);

printf("Aggregate percentage: %.2f%%\n", aggregate);

// Display the grade obtained using if-else ladder if (aggregate >= 80)

{

printf("Grade: Outstanding\n");

}

else if (aggregate >= 70 && aggregate < 80) {

printf("Grade: A+\n");

}

else if (aggregate >= 60 && aggregate < 70) {

printf("Grade: A\n");

}

else if (aggregate >= 50 && aggregate < 60) {

printf("Grade: B+\n");

}

else if (aggregate >= 40 && aggregate < 50) {

printf("Grade: B\n");

}

else

{

printf("Fail;(/n");

}

// Display the grade obtained using switch case switch ((int)aggregate / 10)

{

case 10:

case 9:

case 8:

printf("Grade: Outstanding\n");

break;

case 7:

printf("Grade: A+\n");

break;

case 6:

printf("Grade: A\n");

break;

case 5:

printf("Grade: B+\n");

break;

case 4:

printf("Grade: B\n");

break;

default:

printf("Grade: Fail\n");

break;

}

getch();

}

**Output:**

****

**9.**

**Code:**

#include<stdio.h>

#include<conio.h>

#include<math.h>

void main()

{

float a, b, c, D, root1, root2;

clrscr();

printf("Enter coefficients a, b and c: ");

scanf("%f %f %f", &a, &b, &c);

D = b\*b - 4\*a\*c;

if (D > 0)

{

root1 = (-b + sqrt(D)) / (2\*a);

root2 = (-b - sqrt(D)) / (2\*a);

printf("Roots are real and different.\n");

printf("Root 1 = %.2f\n", root1);

printf("Root 2 = %.2f\n", root2);

}

else if (D == 0)

{

root1 = root2 = -b / (2\*a);

printf("Roots are real and same.\n");

printf("Root 1 = Root 2 = %.2f\n", root1);

}

else

{

float realPart = -b / (2\*a);

float imaginaryPart = sqrt(-D) / (2\*a);

printf("Roots are complex and different.\n");

printf("Root 1 = %.2f+%.2fi\n", realPart, imaginaryPart); printf("Root 2 = %.2f-%.2fi\n", realPart, imaginaryPart); }

getch();

}

**Output:**

****

**10.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int units;

float bill\_amount, meter\_charge = 100.00;

clrscr();

printf("Enter the number of units consumed: ");

scanf("%d", &units);

if (units <= 200)

{

bill\_amount = units \* 0.80;

}

else if (units <= 300)

{

bill\_amount = 200 \* 0.80 + (units - 200) \* 0.90;

}

else

{

bill\_amount = 200 \* 0.80 + 100 \* 0.90 + (units - 300) \* 1.00; }

if (bill\_amount > 400.00)

{

bill\_amount += meter\_charge;

bill\_amount += bill\_amount \* 0.15;

}

printf("Electricity bill: Rs. %.2f\n", bill\_amount);

getch();

}

**Output:**

****

**11.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

float salary, bonus;

char gender;

clrscr();

printf("Enter the salary: ");

scanf("%f", &salary);

printf("Enter the gender (M/F): ");

scanf(" %c", &gender);

bonus = (gender == 'M') ? salary \* 0.05 : salary \* 0.10;

if(salary<10000)

{

bonus+=salary\*0.02;

salary+=bonus;

printf("Bonus : Rs. %.2f\n",bonus);

printf("Salary: Rs. %.2f", salary);

}

else

{

salary += bonus;

printf("Bonus : Rs. %.2f\n",bonus);

printf("Salary: Rs. %.2f", salary);

}

getch();

}

**Output:**

****

**12.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int x, y, z, temp;

clrscr();

printf("Enter the values of x, y, and z: ");

scanf("%d %d %d", &x, &y, &z);

printf("Before rotation: \nx = %d \ny = %d, \nz = %d\n", x, y, z);

temp = x; // Store the value of x in a temporary variable x = y; // Assign the value of y to x

y = z; // Assign the value of z to y

z = temp; // Assign the value of the temporary variable to z

printf("After rotation: \nx = %d\ny = %d\nz = %d\n", x, y, z); getch();

}

**Output:**

****

**13.**

**Code:**

#include<stdio.h>

#include<conio.h>

#include<math.h>

void main()

{

float price;

int rupees, paisa;

clrscr();

printf("Enter the price of the item in decimal form: ");

scanf("%f", &price);

rupees = (int) price; // Type cast the price to an integer to get the rupees

paisa = round((price - rupees) \* 100); // Subtract the rupees to get paisa, and round off to the nearest integer

printf("%d rupees and %d paisa\n", rupees, paisa);

getch();

}

**Output:**

****

**14.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int marks[5];

int i, passCount = 0, failCount = 0;

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

{

printf("Enter the marks for subject %d: ", i+1); scanf("%d", &marks[i]);

if (marks[i] >= 40)

{

passCount++;

}

else

{

failCount++;

}

}

if (passCount == 5)

{

printf("PASS\n");

}

else if (failCount <= 2)

{

printf("ATKT\n");

}

else

{

printf("FAIL\n");

}

getch();

}

**Output:**

****

**15(a).**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int choice;

float radius, base, height, length, width, area;

printf("Enter: \n1 for circle\n2 for triangle \n3 for rectangle "); scanf("%d", &choice);

switch(choice)

{

case 1:

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

scanf("%f", &radius);

area = 3.14 \* radius \* radius;

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

break;

case 2:

printf("Enter the base and height of the triangle: "); scanf("%f %f", &base, &height);

area = 0.5 \* base \* height;

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

case 3:

printf("Enter the length and width of the rectangle: "); scanf("%f %f", &length, &width);

area = length \* width;

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

default:

printf("Invalid choice\n");

}

getch();

}

**Output:**

****

**15(b).**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int num, remainder;

clrscr();

printf("Enter a number: ");

scanf("%d", &num);

remainder = num % 2;

switch(remainder)

{

case 0:

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

break;

case 1:

case -1:

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

break;

default:

printf("Invalid number\n");

}

getch();

}

**Output:**

****

**4) Looping Structures**

**1.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int n, sum = 0, i = 1;

clrscr();

// Using while loop

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

scanf("%d", &n);

while (i <= n)

{

sum += i;

i++;

}

printf("The sum of the first %d natural numbers (using while loop) is: %d\n", n, sum);

// Using for loop

sum = 0; // Reset sum to zero

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

{

sum += i;

}

printf("The sum of the first %d natural numbers (using for loop) is: %d\n", n, sum);

// Using goto statement

sum = 0; // Reset sum to zero

i = 1; // Reset i to 1

start:

sum += i;

i++;

if (i <= n)

{

goto start;

}

printf("The sum of the first %d natural numbers (using goto statement) is: %d\n", n, sum);

getch();

}

**Output:**

****

**2.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int num, pos\_count = 0, neg\_count = 0, pos\_sum = 0, neg\_sum = 0; float pos\_avg, neg\_mean;

char choice;

clrscr();

// Using goto statement

start:

printf("Enter a number (enter -1 to stop): ");

scanf("%d", &num);

if (num == -1)

{

goto end;

}

if (num >= 0)

{

pos\_sum += num;

pos\_count++;

}

else

{

neg\_sum += num;

neg\_count++;

}

goto start;

end:

if (pos\_count > 0)

{

pos\_avg = (float) pos\_sum / pos\_count;

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

printf("Average of positive numbers: %.2f\n", pos\_avg); }

else

{

printf("No positive numbers were entered.\n"); }

if (neg\_count > 0)

{

neg\_mean = (float) neg\_sum / neg\_count;

printf("Sum of negative numbers: %d\n", neg\_sum); printf("Mean of negative numbers: %.2f\n", neg\_mean); }

else

{

printf("No negative numbers were entered.\n"); }

// Using do while loop

pos\_count = 0;

neg\_count = 0;

pos\_sum = 0;

neg\_sum = 0;

do

{

printf("Enter a number (enter -1 to stop): "); scanf("%d", &num);

if (num >= 0)

{

pos\_sum += num;

pos\_count++;

}

else if (num < 0 && num != -1)

{

neg\_sum += num;

neg\_count++;

}

} while (num != -1);

if (pos\_count > 0)

{

pos\_avg = (float) pos\_sum / pos\_count;

printf("Sum of positive numbers: %d\n", pos\_sum); printf("Average of positive numbers: %.2f\n", pos\_avg); }

else

{

printf("No positive numbers were entered.\n");

}

if (neg\_count > 0)

{

neg\_mean = (float) neg\_sum / neg\_count;

printf("Sum of negative numbers: %d\n", neg\_sum); printf("Mean of negative numbers: %.2f\n", neg\_mean); }

else

{

printf("No negative numbers were entered.\n");

}

getch();

}

**Output:**

****

**3.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int x, n, i;

long long y = 1;

clrscr();

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

scanf("%d", &x);

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

scanf("%d", &n);

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

{

y \*= x;

}

printf("%d raised to %d is %lld\n", x, n, y);

getch();

}

**Output:**

****

**4.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int n=18,i,c;

int a=0;

int b=1;

clrscr();

printf("Fibonacci Series(for 20 terms):\n");

printf("%d %d",a,b);

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

{

c=a+b;

a=b;

b=c;

printf(" %d",c);

}

getch();

}

**Output:**

****

**5.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int start, end, i, even\_sum = 0, odd\_sum = 0;

clrscr();

printf("Enter the starting number: ");

scanf("%d", &start);

printf("Enter the ending number: ");

scanf("%d", &end);

for (i = start; i <= end; i++)

{

if (i % 2 == 0)

{

even\_sum += i;

}

else

{

odd\_sum += i;

}

}

printf("Sum of even numbers between %d and %d is %d\n", start, end, even\_sum);

printf("Sum of odd numbers between %d and %d is %d\n", start, end, odd\_sum);

getch();

}

**Output:**

****

**6.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int num, digit, rev = 0;

char\* words[] = {"ZERO", "ONE", "TWO", "THREE", "FOUR", "FIVE", "SIX", "SEVEN", "EIGHT", "NINE"};

clrscr();

printf("Enter a number: "); scanf("%d", &num);

printf("Number in words: ");

// Reverse the number

while (num > 0)

{

digit = num % 10;

rev = rev \* 10 + digit;

num /= 10;

}

// Convert each digit to word while (rev > 0)

{

digit = rev % 10;

printf("%s ", words[digit]); rev /= 10;

}

getch();

}

**Output:**

****

**7.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int i = 1, num, largest = -999999;

clrscr();

while (i <= 10)

{

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

scanf("%d", &num);

if (num > largest)

{

largest = num;

}

i++;

}

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

i = 1;

largest = -999999;

loop:

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

scanf("%d", &num);

if (num > largest)

{

largest = num;

}

i++;

if (i <= 10)

{

goto loop;

}

printf("The largest number is(by goto) %d\n", largest); getch();

}

**Output:**

****

**8.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int num, rev = 0, sum = 0, rem;

clrscr();

printf("Enter a number: ");

scanf("%d", &num);

while (num != 0)

{

rem = num % 10;

rev = rev \* 10 + rem;

sum += rem;

num /= 10;

}

printf("The reverse of the number is: %d\n", rev); printf("The sum of its digits is: %d\n", sum);

getch();

}

**Output:**

****

**9.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int n, i;

unsigned long long fact = 1;

printf("Enter an integer: ");

scanf("%d", &n);

// Error check: Factorial is defined only for non-negative integers. if (n < 0)

{

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

// Calculate the factorial of the number.

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

{

fact \*= i;

}

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

getch();

}

**Output:**

****

**10.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int n, i,j;

float sum = 0;

clrscr();

printf("Enter a value for n: ");

scanf("%d", &n);

// Calculate the sum of the series.

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

{

sum += 1.0 / i;

}

printf("a)The sum of the series is %f\n", sum);

// Calculate the sum of the series.

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

{

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

}

printf("b)Sum of the series = %f\n", sum);

// Calculate the sum of the series.

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

{

sum += 1.0 / (i \* i);

}

printf("c)Sum of the series = %lf\n", sum);

//Error check: Series is defined only for positive integers. if (n <= 0)

{

printf("Error: Series is not defined for non-positive numbers."); }

// Calculate the sum of the series.

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

{

unsigned long long fact = 1;

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

{

fact \*= j;

}

sum += fact;

}

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

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

{

// If i is odd, subtract it from the sum.

if (i % 2 == 1)

{

sum -= i;

}

// If i is even, add it to the sum.

else

{

sum += i;

}

}

printf("e)The sum of the series up to %d is: %d", n, sum);

getch();

}

**Output:**

****

**11.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int low, high, i, j, is\_prime;

clrscr();

printf("Enter the lower limit: ");

scanf("%d", &low);

printf("Enter the upper limit: ");

scanf("%d", &high);

printf("Prime numbers between %d and %d are: ", low, high);

// Traverse each number in the range

for (i = low; i <= high; ++i)

{

// Check if the number is prime or not

is\_prime = 1;

for (j = 2; j <= i/2; ++j)

{

if (i % j == 0)

{

is\_prime = 0;

break;

}

}

// If the number is prime, print it

if (is\_prime == 1)

{

printf("%d ", i);

}

}

getch();

}

**Output:**

****

**12.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int low, high, i, j, sum;

clrscr();

printf("Enter the lower limit: ");

scanf("%d", &low);

printf("Enter the upper limit: ");

scanf("%d", &high);

printf("Perfect numbers between %d and %d are: ", low, high);

// Traverse each number in the range

for (i = low; i <= high; ++i)

{

sum = 0;

// Check if the number is perfect or not

for (j = 1; j <= i/2; ++j)

{

if (i % j == 0)

{

sum += j;

}

}

if (sum == i)

{

printf("%d ", i);

}

}

getch();

}

**Output:**

****

**13.**

**Code:**

#include<stdio.h>

#include<conio.h>

#include<math.h>

void main()

{

int low, high, num, digit, sum, temp;

clrscr();

printf("Enter the lower limit: ");

scanf("%d", &low);

printf("Enter the upper limit: ");

scanf("%d", &high);

printf("Armstrong numbers between %d and %d are: ", low, high);

// Traverse each number in the range

for (num = low; num <= high; num++)

{

// Find the number of digits in the number

temp = num;

int n = 0;

while (temp != 0)

{

n++;

temp /= 10;

}

// Calculate the sum of the cubes of the digits

temp = num;

sum = 0;

while (temp != 0)

{

digit = temp % 10;

sum += pow(digit, n);

temp /= 10;

}

// Check if the number is Armstrong or not

if (num == sum)

{

printf("%d ", num);

}

}

getch();

}

**Output:**

****

**14.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int correct\_number = 42;

int input\_number;

int attempts = 0;

clrscr();

do{

printf("Enter the correct number(Hint: 7\*3\*2): ");

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

attempts++;

} while (input\_number != correct\_number);

printf("Congratulations! You entered the correct number in %d attempts.\n", attempts);

getch();

}

**Output:**

****

**15.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int n;

clrscr();

printf("Enter a positive integer: ");

scanf("%d", &n);

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

{

printf("%d ", i);

}

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

{

printf("%d ", i);

}

printf("\n");

getch();

}

**Output:**

****

**16.**

**Code:**

#include<stdio.h>

#include<conio.h>

void main()

{

int number,i;

const char\* words[] = {"zero", "one", "two", "three", "four", "five", "six", "seven", "eight", "nine", "ten"};

clrscr();

printf("Enter a number between 0 and 10: ");

scanf("%d", &number);

if (number < 0 || number > 10)

{

printf("Error: number out of range (0-10)\n");

}

printf("Number in words: ");

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

{

}

printf("%s ", words[i-1]);

getch();

}

**Output:**

****

**17.**

**Code:**

#include<stdio.h>

#include<conio.h>

void swap(int \*x, int \*y);

void permute(int \*arr, int start, int end);

void main()

{

int n;

clrscr();

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

scanf("%d", &n);

int arr[n];

printf("Enter the elements: ");

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

{

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

}

permute(arr, 0, n - 1);

getch();

}

void swap(int \*x, int \*y)

{

int temp = \*x;

\*x = \*y;

\*y = temp;

}

void permute(int \*arr, int start, int end)

{

if (start == end)

{

// Base case: all elements have been swapped, print permutation for (int i = 0; i <= end; i++)

{

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

}

printf("\n");

}

else

{

// Recursive case: swap each element with the first element and permute the rest

for (int i = start; i <= end; i++)

{

swap(&arr[start], &arr[i]);

permute(arr, start + 1, end);