C-Lab-Day-6

SET-A [5 X 10 = 50]

Program-1 :- [Sum of the natural numbers]

Write a C program to calculate and print the sum of the first N natural numbers without using loops.

Example:

Sample Input:

int n = 10

Sample Output:

The sum of the first 10 natural numbers is: 55

Sol:

```
// Online C compiler to run C program online
#include <stdio.h>

int main() {
    int n;
    printf("Enter num:");
    scanf("%d",&n);
```

```
    n=n*(n+1)/2;
    printf("The sum of the first 10 natural numbers is:%d",n);

    return 0;
}
```

Program-2 :- [Converting the days into years-months-days

Write a C program to take a number of days as input and convert it into the format (years:months:days).

Example:

Sample Input:

---

int days = 500

Sample Output:

---

1 year, 4 months, and 15 days.

Sol:

```
// Online C compiler to run C program online
#include <stdio.h>
```

```
int main() {
    int n,y,m,w,d;
    printf("Enter the total days:");
    scanf("%d",&n);
    y=n/365;
    m=n%365/30;
    w=n%365%30/7;
    d=n%365%30%31;
    printf("Total days is %dyear%dmonths%ddays",y,m,d);

    return 0;
}
```

Program-3 :-

Title :- [Biggest number among three numbers]

Write a C Program to find the biggest number among three numbers without using any loops or if-else statements ?

Sample-Input :-

Enter First number -> 30.

Enter Second number -> 20.

Enter Third number -> 40.

Sample-Output :-

The Biggest number is 40.

Sol:

```
// Online C compiler to run C program online
#include <stdio.h>

int main() {
    int a,b,c,max;
    printf("Enter first number:");
    scanf("%d",&a);
    printf("Enter second number:");
    scanf("%d",&b);
    printf("Enter third number:");
    scanf("%d",&c);
    max=a;
    (b>max) && (max=b);
    (c>max) && (max=c);
    printf("MAX:%d\n",max);
    return 0;
}
```

Program-4 :- [Areas of Square and Rectangle]

Write a C program to calculate and print the area of a square and a rectangle.

Formulas:

The area of a square is calculated using the formula:

Area of Square = Side × Side

The area of a rectangle is calculated using the formula:

-> Area of Rectangle = Length × Breadth

Sample-run:

Sample Input:

Side of square: 5

Length and breadth of rectangle: 4, 5

Sample Output:

The area of the square with side 5 is: 25

The area of the rectangle with length 4 and breadth 5 is: 20

Sol:

```
// Online C compiler to run C program online
#include <stdio.h>

int main() {
    int s,l,b,as,ar;
    printf("Enter the side of a square:");
    scanf("%d",&s);
    as=s*s;
    printf("Area of square is:%d\n",s);
    printf("Enter the length of a rectangle:");
    scanf("%d",&l);
    printf("Enter the breadth of a rectangle:");
    scanf("%d",&b);
    ar=l*b;
    printf("Area of the rectangle:%d",ar);

    return 0;
}
```

Program-5 :- [Compound Interest]

Write a C program to calculate the Compound Interest for a given principal amount, rate of interest, and time period.

The formula for calculating Compound Interest is:

$$\text{Compound Interest (CI)} = \text{Principal} \times \left|1 + \frac{\text{Rate}}{100}\right|^{\text{Time}} - \text{Principal}$$

The program should take inputs for the principal amount, rate of interest, and time period (in years), then calculate and display the Compound Interest.

Sample-run:

Sample Input:

Enter principal amount: 1500

Enter rate of interest: 4

Enter time period (in years): 3

Sample Output:

Compound Interest is: 184.97

Sol:

```
// Online C compiler to run C program online
#include <stdio.h>
#include <math.h>
int main() {
    float pa,roi,tp;
    float ci;
    printf("Enter principle amount:");
    scanf("%f",&pa);
    printf("Enter rate of interest:");
    scanf("%f",&roi);
    printf("Enter time period(in years):");
    scanf("%f",&tp);

    ci=(pa*(pow((100+roi)/100,tp)))-pa;
    printf("Compund interest is:%lf",ci);



    return 0;
}
```

SET-B [5 X 10 = 50]

Program-1 :- [Calculator]

Write a C program to declare and initialize two variables, such as int a = 10, b = 20, and print the results of addition, subtraction, multiplication, division, and modulus operations.

Sample-run:

Sample Input:

---

a = 20, b = 10

Sample Output:

Addition: 30

Subtraction: 10printf("Selling price:%f",sp);

Multiplication: 200

Division: 2

Modulus: 0

Sol:

// Online C compiler to run C program online

```
#include <stdio.h>

int main() {
    int a=20,b=10;
    printf("Addition:%d\n",a+b);
    printf("Substraction:%d\n",a-b);
    printf("Multiplication:%d\n",a*b);
    printf("Division:%d\n",a/b);
    printf("Modulus:%d\n",a%b);
    return 0;
}
```

Program-2 :-

Title :- [Even/Odd w-o-u if-else]

Write a C program to check whether a given number is even or odd without using if-else or ternary operator ?

Sample-Input :-

Enter a number -> 39

Sample-output :-

The number 39 is odd number.

Sol:

```
// Online C compiler to run C program online
#include <stdio.h>

int main() {
    int num;
    printf("Enter a number:");
    scanf("%d",&num);
    (num%2==0) && printf("The number %d is even number",num);
    (num%2!=0) && printf("The number %d is odd number",num);

    return 0;
}
```

Program-3 :- [Profit, VAT Calculations]

A shopkeeper buys a TV set for Rs. 3500 and sells it at a profit of 27%. Additionally, a VAT of 12.7% and a service charge of 3.87% are applied.

Write a C program to display the total selling price, profit, VAT, and service charge.

To calculate the selling price, profit, VAT, and service charge, follow these steps:

i) Calculate the selling price:

Selling Price = Cost Price + Profit

Profit = 27% of Rs. 3500

Selling Price = Rs. 3500 + Profit

ii Calculate the profit:

Profit = Selling Price - Cost Price

iii) Calculate VAT:

VAT = 12.7% of Selling Price

iv) Calculate Service Charge:

Service Charge = 3.87% of Selling Price

Sol:

// Online C compiler to run C program online

#include <stdio.h>

```
int main() {
    float sp,p,pro,vat,sc;
    int cp=3500;
    p=0.27*cp;
    sp=cp+p;
    pro=sp-cp;
    vat=0.127*sp;
    sc=0.387*sp;
    printf("Selling price:%f\n",sp);
    printf("Service charge:%f\n",sc);
    printf("Profit:%f\n",p);
    printf("VAT:%f\n",vat);

    return 0;
}
```

Program-4 :-

Title :- [Reverse a number]

Write a C program to reverse a number without using if-else conditional statements and without using while-loop, for-loop, or do-while loop ?

----------=======----------

E.g. :-

---

input number = 123 [original number]

output number = 321 [reverse number]

Sol:

```
// Online C compiler to run C program online
#include <stdio.h>

int main() {
    int num,ld,m,md,fd;
    printf("Enter the number:");
    scanf("%d",&num);
    ld=num%10;
    m=num/10;
    md=m%10;
    fd=m/10;
    printf("reverse number is:%d%d%d",ld,md,fd);

    return 0;
}
```

Program-5 :- [ok]

Write a C program (without using the ternary operator) to calculate the electricity bill for a given number of units consumed by a customer. The billing rates are as follows:

For the first 100 units, the rate is Rs. 3.00 per unit.

For units between 101 and 200, the rate is Rs. 4.50 per unit.

For units above 200, the rate is Rs. 6.00 per unit.

Examples:

-> Units consumed less than or equal to 100

Sample-run-1

Sample Input: units consumed: 75

Sample Output: The total electricity bill is: Rs. 225.00

-> Units consumed between 101 and 200

Sample-run-2

Sample Input: units consumed: 150

Sample Output: The total electricity bill is: Rs. 525.00

-> Units consumed above 200

Sample-run-2

Sample Input: units consumed: 250

Sample Output: The total electricity bill is: Rs. 1050.00

SET-C [5 X 10 = 50]

Program-1 :- [Positive or Negative or Zero]

Write a C program that takes an integer as input and checks whether it is positive, negative, or zero. Display an appropriate message as output without using the ternary operator.

Sample-run:

---

i).

Sample Input:

Enter an integer: 15

Sample Output:

The number is positive.

ii).

Sample Input:

Enter an integer: -8

Sample Output:

The number is negative.

iii).

Sample Input:

Enter an integer: 0

Sample Output:

The number is zero.

Sol:

```
// Online C compiler to run C program online
#include <stdio.h>
int main() {
    int num;
    printf("Enter an integer:");
    scanf("%d",&num);
    if(num>0)
    {
        puts("The number is positive");
    }
    else if(num<0)
```

```
    {
        puts("The number is negative");
    }
    else
    {
        puts("The number is zero");
    }
    return 0;
}
```

Program-2 :-

Write a C program without using the ternary operator for a bookstore named "BookWorld" that calculates the discounted amount based on the total purchase amount.

The store provides three types of discounts to its customers:

If the total purchase amount is less than Rs. 1000, there is no discount.

If the total purchase amount is between Rs. 1000 and Rs. 5000 (inclusive), customers receive a 5% discount on the total purchase amount.

If the total purchase amount is greater than Rs. 5000, customers receive a 10% discount on the total purchase amount.

Sample-run

Sample Input: purchase amount = 999

Sample Output: Total amount = 999

Sample Input: purchase amount = 2000

Sample Output: Total amount including 5% discount = 1900

Sample Input: purchase amount = 10000

Sample Output: Total amount including 10% discount = 9000

Sol:

```
// Online C compiler to run C program online
#include <stdio.h>

int main() {
    int pa,ta1,ta2,d1,d2;
    printf("Purchase amount=");
    scanf("%d",&pa);
    if(pa<1000)
    {

        printf("Total amount=%d",pa);
    }
    else if(pa>=1000 && pa<=5000)
    {
        d1=0.05*pa;
        ta1=pa-d1;
        printf("Total amount including 5%% discount=%d",ta1);
```

```
    }
    else
    {
        d2=0.1*pa;
        ta2=pa-d2;
        printf("Total amount including 10%% discount=%d",ta2);
    }

    return 0;
}
```

Program-3 :- [Simple-Interest]

Write a C program to calculate the Simple Interest for a given principal amount, rate of interest, and time period.

The formula for calculating Simple Interest is:

Simple Interest (SI) = Principal × Rate × Time

100

The program should take inputs for the principal amount, rate of interest, and time period, then calculate and display the Simple Interest.

Sample-run:

Sample Input:

Enter principal amount: 1000

Enter rate of interest: 5

Enter time period (in years): 2

Sample Output:

Simple Interest is: 100.00

Sol:

```
// Online C compiler to run C program online
#include <stdio.h>

int main() {
    int pa,roi,t;
    float si;
    printf("Enter principal amount:");
    scanf("%d",&pa);
    printf("Enter rate of interest:");
    scanf("%d",&roi);
    printf("Enter time period(in years):");
    scanf("%d",&t);
    si=(pa*roi*t)/100;
    printf("Simple interest is:%.2f",si);
    return 0;
}
```

Program-4 :- [Previous or Next Multiple of Ten]

Write a C program without using control statements to determine the next or previous multiple of 10 for a given two-digit number.

The program should follow these rules:

If the last digit of the given number is greater than or equal to 5, the program should print the next multiple of 10.

If the last digit of the given number is less than 5, the program should print the previous multiple of 10.

Examples:

Sample Input 1:

---

int a = 34;

Sample Output 1: 30

Sample Input 2:

---

int a = 25;

Sample Output 2: 30

Sample Input 3:

---

int a = 86;

Sample Output 3: 90

Sol:

```
// Online C compiler to run C program online
#include <stdio.h>

int main() {
    int n,av;
    printf("Enter number:");
    scanf("%d",&n);
    av=(n%10)/5;
    printf("%d",((n/10)+av)*10);

    return 0;
}
```

Program-5 :- [ok]

You are developing a program for an online bus ticket booking platform called "BusTicketBooker."

The platform offers tickets at a fixed price of Rs. 300 per seat. However, there are discounts available for senior citizens:

If a passenger’s age is between 60 and 100 (inclusive), they receive a 20% discount on the total booking cost.

Write a C program for "BusTicketBooker" that takes the number of tickets and the age of the passenger as inputs and calculates the total booking cost after applying any applicable discount using the ternary operator.

The program should then display the bill with a suitable message, showing the total cost before discount, the discount amount (if applicable), and the total cost after discount.

Your task is to implement the program logic inside the main function using only the ternary operator.

Examples:

-> Passenger is not a senior citizen

Sample Input:

Number of tickets: 3

Age of the passenger: 45

Sample Output:

Total cost before discount: Rs. 900.00

Discount amount: Rs. 0.00

Total cost after discount: Rs. 900.00

-> Passenger is a senior citizen

Sample Input:

Number of tickets: 2

Age of the passenger: 65

Sample Output:

Total cost before discount: Rs. 600.00

Discount amount: Rs. 120.00

Total cost after discount: Rs. 480.00

Sol:

```
#include <stdio.h>
int main() {
    int numberOfTickets;
    int age;
    const float ticketPrice = 300.0;
    // Input number of tickets and age
    printf("Enter number of tickets: ");
    scanf("%d", &numberOfTickets);
    printf("Enter age of the passenger: ");
    scanf("%d", &age);
    // Calculate total cost before discount
    float totalCost = numberOfTickets * ticketPrice;
    // Calculate discount and final total using ternary operator
    float discount = (age >= 60 && age <= 100) ? (0.20 * totalCost) :
0.0;
    float totalCostAfterDiscount = totalCost - discount;
    // Output the results
    printf("Total cost before discount: Rs. %.2f\n", totalCost);
    printf("Discount amount: Rs. %.2f\n", discount);
    printf("Total cost after discount: Rs. %.2f\n",
totalCostAfterDiscount);
```

```
    return 0;
}
```