

C++ PRACTICE PROGRAMS DAY 1

Question1 :

Develop a program to check the entered user name is valid or not. Get both the inputs from the user.

Sample Input:

Enter the user name: Saveetha@789

Reenter the user name: Saveetha@123

Sample Output:

User name is Invalid

```
#include<iostream>

#include<string.h>

using namespace std;

int main()
{
    string a,b;
    cout<<"ENTER THE USER NAME => ";
    cin>>a;
    cout<<"\nREENTER THE USER NAME => ";
    cin>>b;
    if(a==b)
        cout<<"VALID USER NAME";
    else
        cout<<"INVALID USER NAME";

}
```

Question 2:

Identify the Mth maximum number and Nth minimum number in an array and then find the sum of it and difference of it.

Sample Input:

Array of elements = { 14, 16, 87, 36, 25, 89, 34 }

M = 1

N = 3

Sample Output:

1stMaximum Number = 89

3rdMinimum Number = 25

Sum = 114

Difference = 64

Test cases:

- a. { 16, 16, 16 16, 16}, M = 0, N = 1
- b. {0, 0, 0, 0}, M = 1, N = 2
- c. { -12, -78, -35, -42, -85}, M = 3 , N = 3
- d. { 15, 19, 34, 56, 12}, M = 6 , N = 3
- e. { 85, 45, 65, 75, 95}, M = 5 , N = 7

```
#include<iostream>
#include <bits/stdc++.h>
using namespace std;
int main()
{
    int i,a[10],n,min,max;
    cout<<"ENTER NUMBER OF ENTRIES => ";
    cin>>n;
    for(i=0;i<n;i++)
    {
        cout<<"ENTER THE ENTRY "<<i+1<<" => ";
        cin>>a[i];
    }
    sort(a,a+i);
    cout<<"\nSORTED ARRAY\n";
    for(i=0;i<n;i++)
    {
        cout<<a[i]<<" ";
    }
    cout<<"\nenter the nth min => ";
    cin>>min;
    cout<<"\nenter the mth max => ";
    cin>>max;
    cout<<"\nthe "<<min<<"th minimum number is => "<<a[min];
    cout<<"\nthe "<<max<<"th maximum number is => "<<a[n-max];
}
```

Question 3:

Build a program to reverse a number using loop?(Get the input from user)

Sample Input:

Number: 14567

Sample Output:

Reverse Number: 76541

Test cases:

- a. -45721
 - b. 000
 - c. AD1947
 - d. !@#\$\$%
- 145*999=144855

```
#include<iostream>
using namespace std;
int reversenum(int n)
{
    int rev,digit;
    while(n!=0)
    {
        digit=n%10;
        rev=rev*10+digit;
        n=n/10;
    }
    return rev;
}
int main()
{
    int num,j;
    cout<<"enter a number to reverse => ";
    cin>>num;
    j=reversenum(num);
    cout<<j;
}
```

Question 4:

Develop a program to find whether the person is eligible for vote or not. And if that particular person is not eligible, then print how many years are left to be eligible.

Sample Input:

Enter your age:

7

Sample output:

You are allowed to vote after 11 years

Test cases:

- a. 25
- b. Eighteen
- c. 12
- d. -18
- e. 34.5

```
#include<iostream>
using namespace std;
int main()
{
    int a;
    cout<<"ENTER THE AGE => ";
    cin>>a;
    if(a>=18)
```

```

        cout<<"\nperson is eligible for voting ";
    if(a<18)
        cout<<(18-a)<<" years is left for voting => ";
}

```

Question 5:

Develop a program using choice to check

Case 1: Given string is palindrome or not

Case 2: Given number is palindrome or not

Sample Input:

Case = 1

String = MADAM

Sample Output:

Palindrome

Test cases:

- a. MONEY
- b. 5678765
- c. MALAY12321ALAM
- d. MALAYALAM
- e. 1234.4321

```

#include<iostream>
using namespace std;
int main()
{
    string a,b;
    cout<<"ENTER THE STRING => ";
    cin>>a;
    for(int i=a.size()-1;i>=0;i--)
    {
        b+=a[i];
    }
    if(a==b)
        cout<<"THE ENTERED WORD IS PALINDROME....";
    else
        cout<<"THE ENTERED WORD IS NOT A PALINDROME...!!!";
}

```

Question 6:

Develop a program to print Right Triangle Star Pattern

Sample Input:: n = 5

Output:

```

    *
  * *
* * *
* * * *

```

```

#include<iostream>

```

```

using namespace std;

int main()
{
    int i,j,n;
    cout<<"enter the number of rows => ";
    cin>>n;
    for(i=0;i<n+1;i++)
    {
        for(j=0;j<i+1;j++)
        {
            cout<<"*";
        }
        cout<<"\n";
    }
}

```

Question 7:

Develop a program to print the below pattern?

```

      1
    1  1
  1  2  1
1  3  3  1
1  4  6  4  1

```

```

#include<iostream>

using namespace std;

int main()
{
    int i,j,k,temp,n;
    cout<<"enter the number of rows => ";
    cin>>n;
    for(i=0;i<n;i++)
    {

```

```

        for(j=0;j<n-i;j++)
        cout<<" ";
        temp=1;
        for(k=0;k<=i;k++)
        {
            cout<<temp<<" ";
            temp=temp*(i-k)/(k+1);
        }
        cout<<"\n";
    }
}

```

Question 8:

Develop a program using function to calculate the simple interest. Suppose the customer is a senior citizen. He is being offered 12 percent rate of interest; for all other customers, the ROI is 10 percent.

Sample Input:

Enter the principal amount: 200000

Enter the no of years: 3

Is customer senior citizen (y/n): n

Sample Output:

Interest: 60000

```
#include<iostream>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
    int p,y,c,i,a;
```

```
    cout<<"enter the principle amount => ";
```

```
    cin>>p;
```

```
    cout<<"\nenter the no of years => ";
```

```
    cin>>y;
```

```
    cout<<"\n1.senior citizen\n2.not senior citizen";
```

```

cout<<"\n enter the choise => ";
cin>>c;
switch(c)
{
    case 1:
        a=p*y*12/100;
        cout<<"\n the simple interest for senior citizen is => " <<a;
        break;
    case 2:
        i=p*y*10/100;
        cout<<"\nthe simple interest for normal citizen is => " <<i;

    }
}

```

Question 9:

Build a class **series** and use **member function input()** for getting a number and **member function show()** to print fibonacci series of a number.

```

#include<iostream>
using namespace std;
class series
{
    public:
    int n,a=0,b=1,sum=0,count=1;
    void input()
    {
        cout<<"enter the limit => ";
        cin>>n;
    }
    void show()
    {
        while(count!=n+1)

```

```

        {
            cout<<sum<<"\n";
            count+=1;
            a=b;
            b=sum;
            sum=a+b;
        }
    };
int main()
{
    series s1;
    s1.input();
    s1.show();
}

```

Question 10 :

Develop a program to print the below pattern

```

1
2 2
3 3 3
4 4 4 4

```

```

#include<iostream>
using namespace std;
int main()
{
    int row,i,j;
    cout<<"ENTER THE NUMBER OF ROWS => ";
    cin>>row;
    for(i=0;i<row;i++)

```



```

        {
            for(j=0;j<=i;j++)
            {
                cout<<i+1;
            }
            cout<<"\n";
        }
    }
}

```

Question 11:

Build a C++ program to print the below pattern

```

1
2 2
3 3 3
4 4 4 4
3 3 3
2 2
1

```

```

#include <iostream>

```

```

using namespace std;

```

```

void printPattern(int n)

```

```

{
    for (int i = 1; i <= n; i++)
    {
        for (int j = 1; j <= i; j++)
            cout << i;
        cout << "\n";
    }
    for (int i = n - 1; i > 0; i--)
    {
        for (int j = i; j > 0; j--)

```

```

        cout << i;

        cout << "\n";

    }

}

int main()
{

    int n;

    cout<<"ENTER THE MAXIMUM NUMBER => ";

    cin>>n;

    printPattern(n);

    return 0;

}

```

Question 12:

Develop a C++ program to generate Electricity bill. Create a class with the following members: Consumer no., consumer name, previous month reading, current month reading, type of EB connection (i.e domestic or commercial).

Compute the bill amount using the following tariff. If the type of the EB connection is domestic, calculate the amount to be paid as follows:

First 100 units - Rs. 1 per unit
 101-200 units - Rs. 2.50 per unit
 201 -500 units - Rs. 4 per unit
 > 501 units - Rs. 6 per unit

If the type of the EB connection is commercial, calculate the amount to be paid as follows:

First 100 units - Rs. 2 per unit
 101-200 units - Rs. 4.50 per unit
 201 -500 units - Rs. 6 per unit
 > 501 units - Rs. 7 per unit

```
#include<iostream>
```

```
using namespace std;
```

```
class ebill
```

```
{
```

```
    public:
```

```
        int cons_no,pre_read,cur_read,eb_type,usedunits;
```

```
        string cons_name;
```

```

        float amount=0;

        void input(void);

        void calculation();

        void display();

};

void ebill::input()
{
    cout<<"ENTER CUSTOMER NUMBER => ";
    cin>>cons_no;
    cout<<"\nENTER CONSUMER NAME => ";
    cin>>cons_name;
    cout<<"\nENTER THE PREVIOUS MONTH UNITS READING => ";
    cin>>pre_read;
    cout<<"\nENTER THE CURRENT MONTH UNITS READING => ";
    cin>>cur_read;
    cout<<"\nENTER THE EB TYPE\n1 - domestic\n2 - commercial\n";
    cin>>eb_type;
}

void ebill::calculation()
{
    if(eb_type==1)
    {
        usedunits=cur_read-pre_read;

        if(usedunits<=100)
            amount=(usedunits*1);

        if(usedunits>100&&usedunits<=200)
            amount=100+((usedunits-100)*2.5);

        if(usedunits>200&&usedunits<=500)
            amount=350+((usedunits-200)*4);

        if(usedunits>500)

```

```

        amount=1550+((usedunits-500)*7);
    }
    if(eb_type==2)
    {
        usedunits=cur_read-pre_read;
        if(usedunits<=100)
            amount=(usedunits*2);
        if(usedunits>100&&usedunits<=200)
            amount=200+((usedunits-100)*4.5);
        if(usedunits>200&&usedunits<=500)
            amount=650+((usedunits-200)*6);
        if(usedunits>500)
            amount=2450+((usedunits-500)*7);
    }
}

void ebill::display()
{
    cout<<"YOUR EBILL AMOUNT IS => "<<amount;
}

int main()
{
    ebill e1;
    e1.input();
    e1.calculation();
    e1.display();
}

```

Question 13 :

Develop a C++ program to perform different arithmetic operations such as addition, subtraction, division, modulus and multiplication switch case

```
#include<iostream>
```

```

using namespace std;

int main()
{
    int a,b,input;
    float div;

    cout<<"CALCULATOR\n\n1 - add\n2 - subtract\n3 - multiplication\n4 - division\n5
- modulus\n";

    cout<<"ENTER THE OPERATION => ";
    cin>>input;
    cout<<"\nNUMBER 1 : ";
    cin>>a;
    cout<<"\nNUMBER 2 : ";
    cin>>b;
    switch(input)
    {
        case 1:
            cout<<a<<" + "<<b<<" = "<<(a+b);
            break;

        case 2:
            cout<<a<<" - "<<b<<" = "<<(a-b);
            break;

        case 3:
            cout<<a<<" x "<<b<<" = "<<(a*b);
            break;

        case 4:
            div=(float)a/(float)b;
            cout<<a<<" / "<<b<<" = "<<div;
            break;

        case 5:
            cout<<a<<" % "<<b<<" = "<<(a%b);
            break;
    }
}

```

default:

```
cout<<"ENTERED OPERATION IS INVALID ...!!";
```

```
}
```

```
}
```

Question 14 :

Develop a Employee class with Emp_name, Emp_id, Address, Mail_id, Mobile_no as members. Inherit the classes, Programmer, Assistant Professor, Associate Professor and Professor from employee class. Add Basic Pay (BP) as the member of all the inherited classes with 97% of BP as DA, 10 % of BP as HRA, 12% of BP as PF, 0.1% of BP for staff club fund. Generate pay slips for the employees with their gross and net salary.

```
#include<iostream>
```

```
using namespace std;
```

```
class employee
```

```
{
```

```
public:
```

```
string Emp_name,Mail_id,Address,Emp_id,Mobile_no;
```

```
double BP,GP,NP,DA,HRA,PF,CF;
```

```
void input()
```

```
{
```

```
    cout<<"\n\nEnter Name of the Employee : ";
```

```
    cin>>Emp_name;
```

```
    cout<<"\n\nEnter Address of the Employee : ";
```

```
    cin>>Address;
```

```
    cout<<"\n\nEnter ID of the Employee : ";
```

```
    cin>>Emp_id;
```

```
    cout<<"\n\nEnter Mobile Number : ";
```

```
    cin>>Mobile_no;
```

```
    cout<<"\n\nEnter E-Mail ID of the Employee : ";
```

```
    cin>>Mail_id;
```

```
}
```

```
void display()
```

```

{
    cout<<"\nNAME => "<<Emp_name;
    cout<<"\nADDRESS => "<<Address;
    cout<<"\nEMPLOYEE ID => "<<Emp_id;
    cout<<"\nMOBILE NUMBER => "<<Mobile_no;
    cout<<"\nMAIL ID => "<<Mail_id<<"\n";
}

void calculation()
{
    DA=BP*0.97;
    HRA=BP*0.10;
    PF=BP*0.12;
    CF=BP*0.01;
    GP=BP+DA+HRA+PF;
    NP=GP-PF-CF;
}

void basicpaydisplay()
{
    cout<<"\nBASIC PAY => "<<BP;
    cout<<"\nDEARNNESS ALLOWANCE => "<<DA;
    cout<<"\nHOUSE RENT ALLOWENCE => "<<HRA;
    cout<<"\nPROVIDENT FUND => "<<PF;
    cout<<"\nCLUB FUND => "<<CF;
    cout<<"\nGROSS PAY => "<<GP;
    cout<<"\nNET PAY => "<<NP;
}

};

class programmer:public employee
{
    public:

```

```

double bp1;
void proginput()
{
    cout<<"\nENTER THE BASIC PAY OF THE PROGRAMMER => ";
    cin>>BP;
    cout<<"\n=====PROGRAMMER    PAYMENT
SLIP\n=====";
}

};

class assistantprof:public employee
{
    public:
    void assprofinput()
    {
        cout<<"\nENTER THE BASIC PAY OF THE ASSISTANT PROFESSOR =>
";
        cin>>BP;
        cout<<"\n=====ASSISTANT
PROFESSOR PAYMENT SLIP\n=====
";
    }

};

class associateprof:public employee
{
    public:
    void assoprofinput()
    {
        cout<<"\nENTER THE BASIC PAY OF THE ASSOCIATE PROFESSOR =>
";
        cin>>BP;
        cout<<"\n=====ASSOCIATE
PROFESSOR PAYMENT SLIP\n=====
";
    }
}

```



```

};

class professor:public employee
{
    public:
    void profinput()
    {
        cout<<"\nENTER THE BASIC PAY OF THE PROFESSOR => ";
        cin>>BP;
        cout<<"\n=====PROFESSOR PAYMENT
SLIP\n=====\\n";
    }
};

int main()
{
    programmer p1;
    p1.input();
    p1.display();
    p1.proginput();
    p1.calculation();
    p1.basicpaydisplay();
    assistantprof a1;
    a1.input();
    a1.display();
    a1.assprofinput();
    a1.calculation();
    a1.basicpaydisplay();
    assosciateprof a2;
    a2.input();
    a2.display();
    a2.assoprofinput();
    a2.calculation();

```

```

        a2.basicpaydisplay();
        professor p2;
        p2.input();
        p2.display();
        p2.profinput();
        p2.calculation();
        p2.basicpaydisplay();
    }

```

Question 15:

Develop a class in C++ program To compute a record of 10 students, Read the name, Regno ,mark1,mark2,mark3 of the student, calculate the average marks and grade for to display it.

Test Case Average >90 , Grade – S

Average >80 , Grade A

Average >70, Grade C

Average >60 Grade D

Average >50 Grade E

Average less than 50 Grade F

```

#include<iostream>
using namespace std;
class student
{
    public:
        string name;
        int regno,mark1,mark2,mark3;
        float avg;
        void input();
        void calculation();
        void display();
};
void student::input()

```

```

{
    cout<<"\n\nENTER THE STUDENT NAME => ";
    cin>>name;
    cout<<"\nENTER THE REGISTER NUMBER => ";
    cin>>regno;
    cout<<"\nMARK 1 => ";
    cin>>mark1;
    cout<<"\nMARK 2 => ";
    cin>>mark2;
    cout<<"\nMARK 3 => ";
    cin>>mark3;
}

void student::calculation()
{
    avg=(mark1+mark2+mark3)/3;
}

void student::display()
{
    cout<<"\nAVERAGE SCORE IS => "<<avg;
    if(avg>90)
        cout<<"\nS GRADE";
    if(avg>80 && avg<90)
        cout<<"\nA GRADE";
    if(avg>70 && avg<80)
        cout<<"\nC GRADE";
    if(avg>60 && avg<70)
        cout<<"\nD GRADE";
    if(avg>50 && avg<60)
        cout<<"\nE GRADE";
    if(avg<50)

```

```

        cout<<"\nF GRADE";
    }
int main()
{
    int number;
    student s[20];
    cout<<"ENTER THE NUMBER OF STUDENT ENTRIES => ";
    cin>>number;
    for(int i=0;i<number;i++)
    {
        s[i].input();
        s[i].calculation();
        s[i].display();
    }
}

```

Question 16:

Develop a Program in C++ to calculate income tax for the employee based on the following condition

1. if taxableincome<=60000, tax=0;
2. if taxableincome >60000 and taxableincome <=150000,
tax= taxableincome *0.05;
- 3.if taxableincome >150000 or taxableincome <=500000)

tax= taxableincome *0.1;

else

tax=tableinc*0.15;

```
#include<iostream>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
    int income,tax;
```

```
    cout<<"ENTER THE INCOME => ";
```

```
cin>>income;
if(income<60000)
tax=0;
if(income>60000 && income<150000)
tax=income*0.05;
if(income>150000 && income<500000)
tax=income*0.1;
if(income>500000)
tax=income*0.15;
cout<<"YOUR INCOME TAX FOR THE ENTERED INCOME IS => "<<tax;
}
```

\$