Decision making programs (if –else/switch case construct)

1. Read marks of a student and award the grade accordingly

#include <iostream>

using namespace std;

int main()

{

    int m;

    cout << "Enter your marks:"<<endl;

    cin >> m;

    if(m>80 && m<100)

    cout<<"Your Grade is A ";

    if(m>50 && m<80)

    cout<<"Your Grade is B ";

    if(m>30 && m<50)

    cout<<"Your Grade is C ";

    if(m>10 && m<30)

    cout<<"Your Grade is D ";

    return 0;

}

2. Check if the no is even or odd and display accordingly

#include <iostream>

using namespace std;

int main()

{

    int n;

    cout << "Enter a number:"<<endl;

    cin >> n;

    if(n%2==0)

    cout<<"Entered number is Even";

    if(n%2!=0)

    cout<<"Entered number is Odd";

    return 0;

}

3. Check if the no is positive or negative

#include <iostream>

using namespace std;

int main()

{

    int n;

    cout << "Enter an integer:"<<endl;

    cin >> n;

    if(n>0)

    cout<<"Entered number is Positive";

    if(n<0)

    cout<<"Entered number is Negative";

    if(n==0)

    cout<<"Entered number is neither negative nor positive";

    return 0;

}

4. Display maximum of 3 nos

#include <iostream>

using namespace std;

int main()

{

    int n1,n2,n3;

    cout << "Enter 3 numbers:"<<endl;

    cin >> n1;

    cin >> n2;

    cin >> n3;

    if(n1 > n2 && n1 > n3)

    cout<<n1<<" is Maximum"<<endl;

    if(n2 > n1 && n2 > n3)

    cout<<n2<<" is Maximum"<<endl;

    if(n3 > n1 && n3 > n2)

    cout<<n3<<" is Maximum"<<endl;

    return 0;

}

5. Display difference between max and min of 3 nos.

#include <iostream>

using namespace std;

int main()

{

    int n1,n2,n3,max,min;

    cout << "Enter 3 numbers:"<<endl;

    cin >> n1;

    cin >> n2;

    cin >> n3;

    if(n1 > n2 && n1 > n3)

    max = n1;

    if(n2 > n1 && n2 > n3)

    max = n2;

    if(n3 > n1 && n3 > n2)

    max = n3;

    if(n1 < n2 && n1 < n3)

    min = n1;

    if(n2 < n1 && n2 < n3)

    min = n2;

    if(n3 < n1 && n3 < n2)

    min = n3;

    int dif = max - min;

    cout<<" Difference between maximum and minimum = "<<dif<<endl;

    return 0;

}

6. Read a character and check if it is a vowel

#include <iostream>

using namespace std;

int main()

{

    char ch;

    cout << "Enter a character:"<<endl;

    cin >> ch;

    if(ch == 'A'||ch == 'E'||ch == 'I'||ch == 'O'||ch == 'U'||ch == 'a'||ch == 'e'||ch == 'i'||ch == 'o'||ch == 'u')

    {

    cout<<ch<<" is a vowel "<<endl;

    }

    else

    {

        cout<<ch<<" is not a vowel "<<endl;

    }

    return 0;

}

7. Read a character and check if it is a digit

#include <iostream>

using namespace std;

int main()

{

    char ch;

    cout << "Enter a character:"<<endl;

    cin >> ch;

    if(ch>='0' && ch<='9')

    {

    cout<<ch<<" is a digit "<<endl;

    }

    else

    {

        cout<<ch<<" is not a digit "<<endl;

    }

    return 0;

}

8. Read a character and convert to lower case if it is Upper case

#include <iostream>

using namespace std;

int main()

{

    char ch,cha;

    cout << "Enter a character:"<<endl;

    cin >> ch;

     if (islower(ch))

     {

         cha = toupper(ch);

         cout<<"Upper case version of "<<cha<<endl;

     }

     else

     {

         cout<<"ALREADY IN UPPERCASE"<<endl;

     }

    return 0;

}

9. Read Salary of a person and display the tax as per the tax slabs below

a. Salary<=3 lakhs ->No tax

b. 3L10% of the amount exceeding 3 lakhs

c. Salary >5L -> Rs. 30000 +15% of Amount exceeding 5L

#include <iostream>

using namespace std;

int main()

{

    double sal;

    double tax;

    double total;

    cout << "Enter your Salary:"<<endl;

    cin >> sal;

    if(sal<=300000)

    cout<<"No tax "<<endl;

    if(sal> 300000 && sal <= 500000)

    {

        double d = sal - 300000;

        tax = d \* 0.1;

        total = sal + tax;

        cout<<"You have to pay "<<total<<endl;

    }

    if(sal>500000)

    {

        double d = sal - 500000;

        tax = d \* 0.15;

        total = 30000+ sal + tax;

        cout<<"You have to pay "<<total<<endl;

    }

    return 0;

}

10.Convert Celsius to Fahrenheit and vice versa as per user’s choice

#include <iostream>

using namespace std;

int main()

{

    int choice;

    cout << "Enter 1 if you want to convert Fahrenheit to Celsius scale:"<<endl;

    cout << "Enter 2 if you want to convert Celsius to Fahrenheit scale:"<<endl;

    cin >> choice;

    if(choice==1)

    {

        double cel,fah;

        cout << "Enter the temperature in Fahrenheit scale:"<<endl;

        cin >> fah;

        cel = (fah - 32)\* 5/9;

        cout<<"Temperature in Celsius scale: "<<cel<<endl;

    }

    else if(choice==2)

    {

        double cel,fah;

        cout << "Enter the temperature in Celsius scale:"<<endl;

        cin >> cel;

        fah = (cel \* 9/5)+32;

        cout<<"Temperature in Fahrenheit scale: "<<fah<<endl;

    }

    return 0;

}

11. Read a number from user and display the day.For e.g. Input 2 Output ->Tuesday

#include <iostream>

using namespace std;

int main()

{

    int choice;

    cout << "Enter a number"<<endl;

    cin >> choice;

    switch(choice)

    {

        case 1: cout<<"MONDAY"<<endl;

        break;

        case 2: cout<<"TUESDAY"<<endl;

        break;

        case 3: cout<<"WEDNESDAY"<<endl;

        break;

        case 4: cout<<"THURSDAY"<<endl;

        break;

        case 5: cout<<"FRIDAY"<<endl;

        break;

        case 6: cout<<"SATURDAY"<<endl;

        break;

        case 7: cout<<"SUNDAY"<<endl;

        break;

        default: cout<<"There are only seven days in a week:"<<endl;

    }

    return 0;

}

12. Read the distance traveled by a person and display the fare accordingly

a. distance<=5kms ->fixed Rs. 100

b. 5< distance <=10kms ->above + Rs 12per km

c. distance >=10kms ->above + Rs 15per km

#include <iostream>

using namespace std;

int main()

{

    int dis;

    int bill;

    cout << "Enter the distance"<<endl;

    cin >> dis;

    if(dis<=5)

    {

        bill = 100;

    }

    if(dis>5 && dis<=10)

    {

        int d = dis - 5;

        bill = 100 + d\*12;

    }

    if(dis>=10)

    {

       int di = dis - 10;

       bill = 160 + di\*15;

    }

    cout<<"Your bill = " <<bill<<endl;

    return 0;

}

13. Give below options and execute the choice using switch-case

a. Add 2 nos

b. Subtract 2 nos

c. Multiply 2 nos

Read user’s choice along with the nos and display the result accordingly

#include <iostream>

using namespace std;

int main()

{

    int choice;

    int a,b;

    cout << "Enter 1 to add 2 numbers"<<endl;

    cout << "Enter 2 to subtract 2 numbers"<<endl;

    cout << "Enter 3 to multiply 2 numbers"<<endl;

    cin >> choice;

    cout<<"Enter 2 numbers"<<endl;

    cin >> a;

    cin >> b;

    switch(choice)

    {

        case 1:int sum;

               sum = a + b;

               cout<<"Sum of "<<a<<" and "<<b<<" is "<<sum<<endl;

        break;

        case 2:int dif;

                if(a>b)

                {

                    dif = a-b;

                    cout<<"Difference of "<<a<<" and "<<b<<" is "<<dif<<endl;

                }

                else

                {

                    dif = b-a;

                    cout<<"Difference of "<<b<<" and "<<a<<" is "<<dif<<endl;

                }

        break;

        case 3: int pro;

                pro = a\*b;

                cout<<"Product of "<<a<<" and "<<b<<" is "<<pro<<endl;

        break;

        default: cout<<"Enter a number from the given options:"<<endl;

    }

    return 0;

}

14. Check if the year input by user is a leap year

#include <iostream>

using namespace std;

int main()

{

  int y;

  cout << "Enter a year: ";

  cin >> y;

  if ((y % 4 == 0 && y % 100 != 0) || y % 400 == 0)

  {

    cout << y << " is a leap year.";

  }

  else

  {

    cout << y << " is not a leap year.";

  }

  return 0;

}

15. The Bank sanctions ‘Housing Loan’ to the employees belonging to HIG group, MIG group, LIG group according to their yearly income:

HIG :High Income group,

MIG : Middle Income group,

LIG :Lower Income group

|  |  |  |
| --- | --- | --- |
| **Category** | **Yearly Income** | **Loan Amount** |
| LIG group | Up to Rs. 1,50,000 | 150% of annual income |
| MIG group | Rs. 1,50,001 - Rs. 5,00,000 | 200% of annual income |
| HIG group | More than Rs. 5,00,000 | 250% of annual income |

WAP a program to calculate the loan amount to be sanctioned by the Bank, taking name, yearly income and the category ( ‘H’ for HIG group, ‘M’ for MIG group, ‘L’ for LIG group) as Inputs

#include <iostream>

using namespace std;

int main()

{

    string name;

    double income;

    double loanamt;

    cout << "Enter your name: "<<endl;

    cin >> name;

    cout << "Enter your annual income: "<<endl;

    cin >> income;

    if(income<=150000)

    {

        loanamt = 1.5\* income;

    }

    if(income>150001 && income<500000)

    {

        loanamt = 2 \* income;

    }

    if(income>=500000)

    {

       loanamt = 2.5 \* income;

    }

    cout<<"Your Loan amount = " <<loanamt<<endl;

    return 0;

}

16.Read unit, tens and hundreds digit of a number and display the corresponding number.

Also check if it is an Armstrong number

#include <iostream>

using namespace std;

int main()

{

    int u,t,h;

    cout << "Enter units digit:"<<endl;

    cin >> u;

    cout << "Enter tens digit:"<<endl;

    cin >> t;

    cout << "Enter hundreds digit:"<<endl;

    cin >> h;

    int hu = h\*100;

    int ten = t\*10;

    int num = hu + ten + u;

    cout << "The number = "<<num<<endl;

    int unit,tens,hun;

    unit = u\*u\*u;

    ten = t\*t\*t;

    hun = h\*h\*h;

    int sum = unit + ten + hun;

    if(sum == num)

    {

        cout<<num<<" is an Armstrong number: "<<endl;

    }

    else

    {

        cout<<num<<" is not an Armstrong number:"<<endl;

    }

    return 0;

}

17. Read Principle, Rate and time from the user and suggest to the user which option is better of the simple interest / compound interest based on the final amount after the tenure.

#include <iostream>

#include <math.h>

using namespace std;

int main()

{

    double p,r,t;

    cout << "Enter the principal:"<<endl;

    cin >> p;

    cout << "Enter the rate:"<<endl;

    cin >> r;

    cout << "Enter the time in years:"<<endl;

    cin >> t;

    double msi = p \* r \* t;

    double si = msi /100;

    double amt = si + p;

    double ti = t \* 12;

    double R = r/100;

    double ra = R+1;

    double m = pow(ra,ti);

    double am = p \* m;

    if(amt>am)

    cout<<"Simple interest is the best option:"<<endl;

    else

    cout<<"Compound interest is the best option:"<<endl;

    return 0;

}

18. Read 3 numbers and display the count and sum of those which are even

#include <iostream>

using namespace std;

int main()

{

    int a[3];

    cout << "Enter three numbers"<<endl;

    for(int i = 0; i<sizeof(a);i++)

    cin >> a[i];

    int sum = 0;

    int count = 0;

    for(int i =0;i<sizeof(a);i++)

    {

        if(a[i]%2 == 0)

        {

            count++;

            sum = sum + a[i];

        }

    }

    cout<< "Sum =   " <<sum<<endl;

    cout<< "Count = "<<count<<endl;

    return 0;

}

19. Read an amount from the user and display the number of below currency notes in the same. Notes are of denominations 1000, 500, 100, 50 and 10

#include <iostream>

using namespace std;

int main()

{

    int amnt;

    cout << "Enter the amount:"<<endl;

    cin >> amnt;

    int thous = amnt/1000;

    int remofthou = amnt % 1000;

    int fivehun = remofthou / 500;

    int remoffh = remofthou % 500;

    int hun = remoffh/100;

    int remofhun = remoffh%100;

    int fifty = remofhun / 50;

    int remoffif = remofhun%50;

    int ten = remoffif/10;

    int remains = remoffif%10;

    cout<<"No. of Thousand rupee notes:     "<<thous<<endl;

    cout<<"No. of Five hundred rupee notes: "<<fivehun<<endl;

    cout<<"No. of Hundred rupee notes:      "<<hun<<endl;

    cout<<"No. of Fifty rupee notes:        "<<fifty<<endl;

    cout<<"No. of Ten rupee notes:          "<<ten<<endl;

    cout<<"Remaining change:                "<<remains<<endl;

    return 0;

}

20. WAP to display roots of a quadratic equation a\*x^2 +b\*x + c =0

#include <iostream>

#include <math.h>

using namespace std;

int main()

{

    double a,b,c;

    cout << "Enter a,b and c for the equation"<<endl;

    cin >> a;

    cin >> b;

    cin >> c;

    double x;

    double xf;

    double y;

    double yf;

    double d = (b\*b) - 4\*a\*c;

    if(d>0)

    {

        cout <<"The equation has two real and unequal roots:"<<endl;

         x = -b + sqrt(d);

         xf = x/2\*a;

         y = -b - sqrt(d);

         yf = y/2\*a;

        cout << "Solution "<<xf <<" , "<<yf<<endl;

    }

    else if(d==0)

    {

        cout <<"The equation has two real and equal roots:"<<endl;

         xf = -b/2\*a;

        cout << "Solution "<<xf <<endl;

    }

    else

    {

        cout <<"The equation has imaginary roots:"<<endl;

    }

    return 0;

}