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Lab # 1

1 Read two integers and print their sum.

    #include<iostream>

    using namespace std;

    int main(){

        int a, b;

        cout<<"enter a and b: ";

        cin>>a>>b;

        cout<<"a+b = "<<a+b<<endl;

        return 0;

    }

2 Read two integers and print their difference (first minus second).

    #include<iostream>

    using namespace std;

    int main(){

        int a, b;

        cout<<"enter a and b: ";

        cin>>a>>b;

        cout<<"a-b = "<<a-b<<endl;

        return 0;

    }

3 Read two integers and print their product.

    #include<iostream>

    using namespace std;

    int main(){

        int a, b;

        cout<<"enter a and b: ";

        cin>>a>>b;

        cout<<"a\*b = "<<a\*b<<endl;

        return 0;

    }

4 Read two integers and print the integer quotient and remainder (use / and %).

    #include<iostream>

    using namespace std;

    int main(){

        int a, b;

        cout<<"enter a and b: ";

        cin>>a>>b;

        cout<<"a/b = "<<a/b<<endl;

cout<<"a%b = "<<a%b<<endl;

        return 0;

    }

5 Read a floating-point number and print its square.

    #include<iostream>

    using namespace std;

    int main(){

        float a;

        cout<<"enter a: ";

        cin>>a;

        cout<<"a square is = "<<a\*a<<endl;//pow(a,2)

        return 0;

    }

6 Read a floating-point number and print its cube.

    #include<iostream>

    using namespace std;

    int main(){

        float a;

        cout<<"enter a: ";

        cin>>a;

        cout<<"a square is = "<<a\*a\*a<<endl;//pow(a,3)

        return 0;

    }

7 Given the side of a square, compute its perimeter and area.

    #include<iostream>

    using namespace std;

    int main(){

        int a;

        cout<<"enter side of square: ";

        cin>>a;

        cout<<"perimeter = "<<a\*4<<endl;

cout<<"area = "<<a\*a;

        return 0;

    }

8 Given the length and width of a rectangle, compute perimeter and area.

    #include<iostream>

    using namespace std;

    int main(){

        int a,b;

        cout<<"enter sides of rectangle: ";

        cin>>a>>b;

        cout<<"perimeter = "<<2\*(a+b)<<endl;

cout<<"area = "<<a\*b;

        return 0;

    }

9 Given the radius r, compute circumference and area of a circle (π=3.14159).

    #include<iostream>

    using namespace std;

    int main(){

        int r;

        cout<<"enter r: ";

        cin>>r;

        cout<<"circumference = "<<3.14159\*2\*r<<endl;

cout<<"area = "<<3.14159\*r\*r<<endl;

        return 0;

    }

10 Convert temperature from Celsius to Fahrenheit.

    #include<iostream>

    using namespace std;

    int main(){

        float c;

        cout<<"enter c: ";

        cin>>c;

        cout<<"f = "<<((c\*9)/5+32)<<endl;

        return 0;

    }

11 Convert temperature from Fahrenheit to Celsius.

        #include<iostream>

    using namespace std;

    int main(){

        float f;

        cout<<"enter f: ";

        cin>>f;

        cout<<"c = "<<((c-32)\*5)/9<<endl;

        return 0;

    }

12 Given distance in kilometers and time in hours, compute average speed (km/h).

    #include<iostream>

    using namespace std;

    int main(){

        int km, h;

        cout<<"enter km and h: ";

        cin>>km>>h;

        cout<<"speed (km/h) = "<<double(km)/h<<endl;

        return 0;

    }

13 Convert minutes to hours and remaining minutes (hint: use / and %).

    #include<iostream>

    using namespace std;

    int main(){

        int m;

        cout<<"enter m: ";

        cin>>m;

        cout<<"hour = "<<m/60<<endl;

cout<<"minutes = "<<m%60<<endl;

        return 0;

    }

14 Convert seconds to hours, minutes, and seconds (use / and %).

    #include<iostream>

    using namespace std;

    int main(){

        int s;

        cout<<"enter seconds: ";

        cin>>s;

        cout<<"hours = "<<s/3600<<endl;

cout<<"minutes = "<<(s%3600)/60<<endl;

cout<<"seconds = "<<(s%60)<<endl;

        return 0;

    }

15 Given principal P, rate R (annual %), and time T (years), compute simple interest SI =

(P×R×T)/100 and amount A = P + SI.

    #include<iostream>

    using namespace std;

    int main(){

        int P,R,T;

        cout<<"enter P,R,T: ";

        cin>>P>>R>>T;

        cout<<"SI = "<<double(P\*R\*T)/100<<endl;

        cout<<"A = "<<P+(double(P\*R\*T)/100)<<endl;

        return 0;

    }

16 Given base and height, compute area of a triangle (A = 0.5×base×height).

    #include<iostream>

    using namespace std;

    int main(){

        int b,h;

        cout<<"enter b and h: ";

        cin>>b>>h;

        cout<<"area = "<<double(b\*h)\*0.5<<endl;

        return 0;

    }

17 Given three sides a, b, c, compute the semi-perimeter s and area using Heron’s formula: A =

sqrt(s(s−a)(s−b)(s−c)).

    #include<iostream>

    using namespace std;

    int main(){

        int a, b, c;

        cout<<"enter a, b and c: ";

        cin>>a>>b>>c;

float s = double(a+b+c)/2;

        cout<<"perimeter = "<<s<<endl;

cout<<"area = "<<pow((s\*(s-a)\*(s-b)\*(s-c)),2)<<endl;

        return 0;

    }

18 Compute Body Mass Index (BMI) given weight (kg) and height (meters): BMI = weight /

(height^2).

    #include<iostream>

    using namespace std;

    int main(){

        int w, h;

        cout<<"enter w8 and ht: ";

        cin>>w>>h;

        cout<<"BMI = "<<double(w)/(h\*h)<<endl;

        return 0;

    }

19 Convert an amount in Pakistani Rupees to US Dollars given an exchange rate.

    #include<iostream>

    using namespace std;

    int main(){

        int r,rate =285;

        cout<<"enter r: ";

        cin>>r;

        cout<<r<<" rupees = "<<double(r)/285<<" dollars"<<<<endl;

        return 0;

    }

20 Given a number of days, compute total hours, minutes, and seconds.

    #include<iostream>

    using namespace std;

    int main(){

        int d;

        cout<<"enter d: ";

        cin>>d;

        cout<<"hours = "<<d\*24<<endl;

        cout<<"minutes = "<<(d\*24\*60)%3600<<endl;

        cout<<"seconds = "<<(d\*24\*3600)%60<<endl;

        return 0;

    }

21 Compute the average of three numbers.

    #include<iostream>

    using namespace std;

    int main(){

        int a, b, c;

        cout<<"enter a, b and c: ";

        cin>>a>>b>>c;

        cout<<"average = "<<double(a+b+c)/3<<endl;

        return 0;

    }

22 Compute the weighted average of three scores given weights w1, w2, w3.

    #include<iostream>

    using namespace std;

    int main(){

        int a, b, c, w1, w2, w3;

        cout<<"enter a ,b ,c and w1, w2, w3: ";

        cin>>a>>b>>c>>w1>>w2>>w3;

        cout<<"weighted average = "<<double(w1\*a+w2\*b+w3\*c)/3<<endl;

        return 0;

    }

23 Compute compound amount A = P(1 + r/n)^(n\*t) (use pow) for given P, r, n, t.

    #include<iostream>

    using namespace std;

    int main(){

        int P,r,n,t;

        cout<<"enter p,r,n,t: ";

        cin>>P>>r>>n>>t;

        cout<<"A = "<<P\*pow((1+double(r)/n),n\*t) <<endl;

        return 0;

    }

24 Given a mark out of 100, compute mark as a fraction and as a percentage.

    #include<iostream>

    using namespace std;

    int main(){

        int marks;

        cout<<"enter marks: ";

        cin>>marks;

        cout<<"marks fraction = "<<marks<<"/"<<100<<endl;

        cout<<"marks percentage = "<<marks<<"%"<<endl;

        return 0;

    }

25 Given two points (x1,y1) and (x2,y2), compute the Euclidean distance.

    #include<iostream>

    using namespace std;

    int main(){

       int x1,x2,y1,y2;

       cout<<"enter x1,y1 and x2,y2: ";

       cin>>x1>>y1>>x2>>y2;

       cout<<"distance between = "<<pow(pow(x2-x1,2)+pow(y2-y1,2),0.5) <<endl;

       return 0;

    }

26 Given two numbers, compute their arithmetic mean, geometric mean, and harmonic mean

(use sqrt for geometric).

    #include<iostream>

    using namespace std;

    int main(){

        int a, b;

        cout<<"enter a and b: ";

        cin>>a>>b;

        cout<<"arithmetic mean = "<<double(a+b)/2<<endl;

cout<<"geometric mean = "<<sqrt(a\*b)<<endl;

cout<<"harmonic mean = "<<2.0/((1.0/a)+(1.0/b))<<endl;

        return 0;

    }

27 Given a salary, compute annual salary after a fixed bonus and a fixed tax percentage (no

conditionals).

    #include<iostream>

    using namespace std;

    int main(){

        int s;

        cout<<"enter s: ";

        cin>>s;

        cout<<"annual salary = "<<(s+100000)\*0.85<<endl;//15% tax

        return 0;

    }

28 Convert a total number of inches to feet and remaining inches.

    #include<iostream>

    using namespace std;

    int main(){

        int inches;

        cout<<"enter inches: ";

        cin>>inches;

        cout<<"feets = "<<inches/12<<endl;

        cout<<"remaining inches = "<<inches%12<<endl;

        return 0;

    }

29 Convert a total number of centimeters to meters and centimeters.

    #include<iostream>

    using namespace std;

    int main(){

        int cm;

        cout<<"enter cm: ";

        cin>>cm;

        cout<<"meters = "<<cm/100<<endl;

        cout<<"remaining centimeters = "<<cm%100<<endl;

        return 0;

    }

30 Compute the final price after applying a discount percentage to an item price.

    #include<iostream>

    using namespace std;

    int main(){

        int item\_price;

        cout<<"enter item price: ";

        cin>> item\_price;

        cout<<"final price = "<< item\_price \* 0.8<<endl;//20% discount

        return 0;

    }

31 Compute the GST/VAT amount and final bill given price and tax rate.

    #include<iostream>

    using namespace std;

    int main(){

        int price;

float tax\_rate;

        cout<<"enter price and tax rate: ";

        cin>>price>>tax\_rate;

        cout<<"GST/VAT = "<<price\*0.175<<endl;//17.5% gst/vat

      cout<<"final bill = "<<price\*(1.0+0.175+tax\_rate)<<endl;

        return 0;

    }

32 Given base b and exponent e, compute b^e using pow (no loops).

    #include<iostream>

    using namespace std;

    int main(){

        int b;

        cout<<"enter b: ";

        cin>>b;

        cout<<"b^e = "<<pow(b,2.7183)<<endl;//e~=2.7183

        return 0;

    }

33 Compute the perimeter of an equilateral triangle given side a.

    #include<iostream>

    using namespace std;

    int main(){

        int a;

        cout<<"enter a: ";

        cin>>a;

        cout<<"perimeter = "<<a\*3<<endl;

        return 0;

    }

34 Compute the area of a regular hexagon of side a using A = (3\*sqrt(3)/2)\*a^2.

    #include<iostream>

    using namespace std;

    int main(){

        int a;

        cout<<"enter a: ";

        cin>>a;

        cout<<"area = "<<(3.0\*sqrt(3)/2)\*pow(a,2) <<endl;

        return 0;

    }

35 Compute the final velocity using v = u + a\*t.

    #include<iostream>

    using namespace std;

    int main(){

        int u,a,t;

        cout<<"enter u, a and t: ";

        cin>>u>>a>>t;

        cout<<"v = "<<u+(a\*t)<<endl;

        return 0;

    }

36 Compute displacement using s = u\*t + 0.5\*a\*t^2.

    #include<iostream>

    using namespace std;

    int main(){

        int u,a,t;

        cout<<"enter u, a and t: ";

        cin>>u>>a>>t;

        cout<<"displacement = "<<(u\*t)+(0.5\*a+pow(t,2))<<endl;

        return 0;

    }

37 Compute the time to cover a distance d at constant speed v.

    #include<iostream>

    using namespace std;

    int main(){

        int d,v;

        cout<<"enter distance and speed: ";

        cin>>d>>v;

        cout<<"time = "<<double(d)/speed<<endl;

        return 0;

    }

38 Given monthly rent and months, compute total rent and average per day (assume 30 days

per month).

    #include<iostream>

    using namespace std;

    int main(){

        int rent , m;

        cout<<"enter rent and months: ";

        cin>>rent>>m;

        cout<<"total rent = "<<rent\*m<<endl;

        cout<<"average per day = "<<double(rent)/30<<endl;

        return 0;

    }

39 Given the diameter of a circle, compute radius and area.

    #include<iostream>

    using namespace std;

    int main(){

        int dia;

        cout<<"enter diameter: ";

        cin>>dia;

        cout<<"radius = "<<double(dia)/2<<endl;

cout<<"area = "<<3.14159\*pow(double(dia),2)<<endl;

        return 0;

    }

40 Given two angles of a triangle, compute the third angle (sum is 180).

    #include<iostream>

    using namespace std;

    int main(){

        int a, b;

        cout<<"enter a and b: ";

        cin>>a>>b;

        cout<<"c = "<<180-a-b<<endl;

        return 0;

    }