1-15 Questions (lab file)

Q1.

#include<iostream>

using namespace std;

int main(){

    char name[20];

    int age;

    cout<<"Enter your name: ";

    cin>>name;

    cout<<"Enter your age: ";

    cin>>age;

    cout<<"Hello "<<name<<","<<" you are "<<age<<" years old";

    return 0;

}

Q2.

#include<iostream>

using namespace std;

int main(){

    int num1,num2;

    cout<<"Enter two numbers: ";

    cin>>num1>>num2;

    int sum = num1+num2;

    cout<<"The sum of the numbers is: "<<sum;

    return 0;

}

Q3.

#include<iostream>

using namespace std;

int main(){

    int a,b;

    cout<<"Enter two numbers: ";

    cin>>a>>b;

    int choice;

    cout<<"Enter 1 for addition"<<endl<<"Enter 2 for subtraction"<<endl<<"Enter 3 for multiplication"<<endl<<"Enter 4 for division"<<endl;

    cout<<"Enter your choice: ";

    cin>>choice;

    switch(choice){

        case 1:cout<<a+b;

            break;

        case 2:cout<<a-b;

            break;

        case 3:cout<<a\*b;

            break;

        case 4:cout<<a/b;

            break;

        default:cout<<"Invalid choice";

    }

    return 0;

}

Q4.

#include<iostream>

#include<iomanip>

using namespace std;

int main(){

    float a,b;

    cout<<"Enter two floating-point numbers: ";

    cin>>a>>b;

    float c= a/b;

    cout<<fixed<<setprecision(2)<<c;

    return 0;

}

Q5.compound interest for a given principle amount,rate of interest, and time period using constants and user input for variables (pending)

#include<iostream>

#include<math.h>

using namespace std;

int main(){

    float p,r,t;

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

    cin>>p;

    cout<<"Enter rate of interest: "<<endl;

    cin>>r;

    cout<<"Enter time period: "<<endl;

    cin>>t;

    double a= p\*pow((1+r/100),t);

    double ci= a-p;

    cout<<"Compound interest: "<<ci;

}

Q6. calculate area and perimeter

#include<iostream>

using namespace std;

int main(){

    int length,width;

    cout<<"Enter length and width of rectangle: ";

    cin>>length>>width;

}

Q7. swap 2 nos temporary variable and then without temp variable

using temporary variable

#include<iostream>

using namespace std;

int main(){

    int a,b;

    cout<<"Enter value of a and b: ";

    cin>>a>>b;

    int c=a;

    a=b;

    b=c;

    cout<<"The new value of a is: "<<a<<endl;

    cout<<"The new value of b is: "<<b;

    return 0;

}

without temporary variable

#include<iostream>

using namespace std;

int main(){

    int a,b;

    cout<<"Enter two numbers a and b: ";

    cin>>a>>b;

    a=a+b;

    b=a-b;

    a=a-b;

    cout<<"The new values of a and b are: "<<a<<" "<<b;

    return 0;

}

Q8.

#include<iostream>

using namespace std;

int main(){

    string fullname;

    int age;

    cout<<"Enter your name: ";

    cin>>

    return 0;

}

Q9. WAP to take 3 inputs (char,int,floating point) display in table

#include<iostream>

using namespace std;

int main(){

    char ch;

    int num;

    float n;

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

    cin>>ch;

    cout<<"Enter integer: "<<endl;

    cin>>num;

    cout<<"Enter a floating point number: "<<endl;

    cin>>n;

    cout<<ch<<"\t"<<"num"<<"\t"<<n;

}

Q10. WAP to determine whether first integer is multiple of second using logical and relational

#include<iostream>

using namespace std;

int main(){

    int num1,num2;

    cout<<"Enter number one and two: ";

    cin>>num1>>num2;

    if(num2==0){

        cout<<"Error: division by zero is not possible.";

    }

    else if(num1 % num2 == 0){

        cout<<num1<<" is divisible by "<<num2;

    }

    else{

        cout<<num1<<" is not divisible by "<<num2;

    }

}

Q11. WAP to count number of 1 bits in an integer input by user

#include<iostream>

using namespace std;

int main(){

    int num,n;

    cout<<"Enter number: ";

    cin>>num;

    n= num;

    int count = 0;

    while (n > 0) {

        count += (n & 1);

        n = n >> 1;

    }

    cout<<"Number of 1 bits in "<<num<<" is: "<<count<<endl;

    return 0;

}

Q12. WAP to solve quadratic equation using conditional statements(real and distinct roots, real and equal roots and complex roots)

#include<iostream>

#include<math.h>

using namespace std;

int main(){

    double a, b, c, discriminant, root1, root2, realPart, imaginaryPart;

    cout << "Enter coefficients a, b and c: ";

    cin >> a >> b >> c;

    // Calculate the discriminant

    discriminant = (b \* b) - (4 \* a \* c);

    if (discriminant > 0) {

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

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

        cout << "Roots are real and distinct: " << root1 << " and " << root2 << endl;

    }

    else if (discriminant == 0) {

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

        cout << "Roots are real and equal: " << root1 << endl;

    }

    else {

        realPart = -b / (2 \* a);

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

        cout << "Roots are complex: " << realPart << " + " << imaginaryPart << "i and "<< realPart << " - " << imaginaryPart << "i" << endl;

    }

    return 0;

}

Q13. WAP to stimulate ATM machine (switch statement) (withdrawal,deposit,balance inquiry and exit. with error handling)

#include <iostream>

using namespace std;

int main() {

    double balance = 1000.0;

    int choice;

    double amount;

    while (true) {

        // ATM menu

        cout << "\n\*\*\*\*\* ATM Menu \*\*\*\*\*\n";

        cout << "1. Withdrawal\n";

        cout << "2. Deposit\n";

        cout << "3. Balance Inquiry\n";

        cout << "4. Exit\n";

        cout << "Enter your choice: ";

        cin >> choice;

        if (cin.fail()) {

            cin.clear();

            cin.ignore(1000, '\n');

            cout << "Invalid input! Please enter a number between 1 and 4.\n";

            continue;

        }

        switch (choice) {

            case 1:

                cout << "Enter amount to withdraw: ";

                cin >> amount;

                if (amount <= 0) {

                    cout << "Invalid amount! Please enter a positive value.\n";

                } else if (amount > balance) {

                    cout << "Insufficient balance!\n";

                } else {

                    balance -= amount;

                    cout << "Withdrawal successful! New balance: $" << balance << endl;

                }

                break;

            case 2:

                cout << "Enter amount to deposit: ";

                cin >> amount;

                if (amount <= 0) {

                    cout << "Invalid amount! Please enter a positive value.\n";

                } else {

                    balance += amount;

                    cout << "Deposit successful! New balance: $" << balance << endl;

                }

                break;

            case 3:

                cout << "Your current balance is: $" << balance << endl;

                break;

            case 4:

                cout << "Thank you for using the ATM. Goodbye!\n";

                return 0;

            default:

                cout << "Invalid choice! Please select a valid option.\n";

        }

    }

    return 0;

}

Q14. WAP to check if triangle is valid based on lengths of its sides and determine its type using nested if-else

#include<iostream>

using namespace std;

int main(){

    int a,b,c;

    cout<<"Enter three sides of triangle: ";

    cin>>a>>b>>c;

    if (a+b>c && a+c>b && b+c>a){

        cout<<"It is a valid triangle."<<endl;

        if(a==b && b==c)

            cout<<"It is equilateral triangle."<<endl;

        else {

            if (a==b||b==c||a==c) {

                cout<<"It is an Isosceles Triangle."<< endl;

            }

            else {

                cout<<"It is a Scalene Triangle."<<endl;

            }

        }

    }

    else

        cout<<"It is not a valid triangle.";

    return 0;

}

Q15. WAP to evaluate (a^b + c&d). explain precedence of bitwise operators

#include <iostream>

using namespace std;

int main() {

    int a, b, c, d;

    cout << "Enter values for a, b, c, d: ";

    cin >> a >> b >> c >> d;

    int result = (a ^ b) + (c & d);

    cout << "Result: " << result << endl;

    return 0;

}

/\*

Explanation for precedence:

Bitwise XOR (^) and Bitwise AND (&) have a higher precedence than arithmetic addition (+).

The bitwise AND (&) between c and d is evaluated first.

The bitwise XOR (^) between a and b is evaluated next.

Finally, the result of (a ^ b) and (c & d) is added using +.

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