### Solution for Question 1: Basic Addition

#include <iostream> using namespace std; int main() {

int num1, num2, sum;

// Input two numbers

cout << "Enter two numbers: "; cin >> num1 >> num2;

// Calculate sum sum = num1 + num2;

// Display result

cout << "The sum is: " << sum << endl; return 0;

}

### Solution for Question 2: Area of a Rectangle

#include <iostream> using namespace std; int main() {

double length, width, area;

// Input length and width

cout << "Enter the length of the rectangle: "; cin >> length;

cout << "Enter the width of the rectangle: "; cin >> width;

// Calculate area

area = length \* width;

// Display result

cout << "The area of the rectangle is: " << area << endl; return 0;

}

### Solution for Question 3: Product of Three Numbers

#include <iostream> using namespace std; int main() {

int num1, num2, num3, product;

// Input three numbers

cout << "Enter three numbers: "; cin >> num1 >> num2 >> num3;

// Calculate product

product = num1 \* num2 \* num3;

// Display result

cout << "The product is: " << product << endl; return 0;

}

### Solution for Question 4: Simple Interest Calculation

#include <iostream> using namespace std; int main() {

double principal, rate, time, simpleInterest;

// Input principal, rate, and time cout << "Enter principal amount: "; cin >> principal;

cout << "Enter rate of interest: "; cin >> rate;

cout << "Enter time in years: "; cin >> time;

// Calculate simple interest

simpleInterest = (principal \* rate \* time) / 100;

// Display result

cout << "The Simple Interest is: " << simpleInterest << endl; return 0;

}

### Question 5: Circle Properties

#include <iostream> using namespace std;

int main() {

double radius, area, circumference; const double PI = 3.14;

// Input radius

cout << "Enter the radius of the circle: "; cin >> radius;

// Calculate area and circumference area = PI \* radius \* radius; circumference = 2 \* PI \* radius;

// Display results

cout << "Area: " << area << endl;

cout << "Circumference: " << circumference << endl;

return 0;

}

### Solution for Question 6: Even or Odd

#include <iostream> using namespace std;

int main() {

int num;

// Input number

cout << "Enter a number: "; cin >> num;

// Check even or odd if (num % 2 == 0) {

cout << num << " is even." << endl;

} else {

cout << num << " is odd." << endl;

}

return 0;

}

### Solution for Question 7: Temperature Conversion

#include <iostream> using namespace std; int main() {

double celsius, fahrenheit;

// Input temperature in Celsius

cout << "Enter temperature in Celsius: "; cin >> celsius;

// Convert to Fahrenheit

fahrenheit = (celsius \* 9 / 5) + 32;

// Display result

cout << "Temperature in Fahrenheit: " << fahrenheit << endl; return 0;

}

### Solution for Question 8: Quotient and Remainder

#include <iostream> using namespace std; int main() {

int dividend, divisor, quotient, remainder;

// Input dividend and divisor cout << "Enter dividend: "; cin >> dividend;

cout << "Enter divisor: "; cin >> divisor;

// Calculate quotient and remainder quotient = dividend / divisor; remainder = dividend % divisor;

// Display results

cout << "Quotient: " << quotient << endl; cout << "Remainder: " << remainder << endl; return 0;

}

### Solution for Question 9: Average of Five Numbers

#include <iostream> using namespace std; int main() {

double num1, num2, num3, num4, num5, average;

// Input five numbers

cout << "Enter five numbers: ";

cin >> num1 >> num2 >> num3 >> num4 >> num5;

// Calculate average

average = (num1 + num2 + num3 + num4 + num5) / 5;

// Display result

cout << "The average is: " << average << endl; return 0;

}

### Solution for Question 10: Square and Cube of a Number

#include <iostream> using namespace std; int main() {

int num, square, cube;

// Input number

cout << "Enter a number: "; cin >> num;

// Calculate square and cube square = num \* num;

cube = num \* num \* num;

// Display results

cout << "Square: " << square << endl; cout << "Cube: " << cube << endl; return 0;

}

### Solution for Question 11: Check Voting Eligibility

#include <iostream> using namespace std; int main() {

int age;

bool isCitizen;

// Input age and citizenship status cout << "Enter age: ";

cin >> age;

cout << "Are you a citizen? Enter 1 for Yes or 0 for No: "; cin >> isCitizen;

// Check voting eligibility if (age >= 18 && isCitizen) {

cout << "You are eligible to vote." << endl;

} else {

cout << "You are not eligible to vote." << endl;

}

return 0;

}

**Solution for Question 12: Check Leap Year**

#include <iostream> using namespace std; int main() {

int year;

// Input year

cout << "Enter a year: "; cin >> year;

// Check leap year conditions

if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) { cout << year << " is a leap year." << endl;

} else {

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

}

return 0;

}

## Solution for Question 13: Logical AND and OR Demonstration

#include <iostream> using namespace std; int main() {

bool a, b;

// Input boolean values

cout << "Enter two boolean values (1 for true, 0 for false): "; cin >> a >> b;

// Perform logical operations

cout << "a AND b: " << (a && b) << endl; cout << "a OR b: " << (a || b) << endl; return 0;

}

## Solution for Question 14: Number Range Check

#include <iostream> using namespace std; int main() {

int num;

// Input number

cout << "Enter a number: "; cin >> num;

// Check if number lies in range [10, 50] if (num >= 10 && num <= 50) {

cout << num << " lies within the range [10, 50]." << endl;

} else {

cout << num << " does not lie within the range [10, 50]." <<

endl;

}

return 0;

}

## Solution for Question15: Check Password Validity

#include <iostream> #include <string> using namespace std; int main() {

string password;

// Input password

cout << "Enter a password: "; getline(cin, password);

// Check password validity

if (password.length() >= 8 && password.find(' ') == string::npos)

{

cout << "Password is valid." << endl;

} else {

cout << "Password is invalid." << endl;

}

return 0;

}

### Assignment Operator:

**Solutions**

**Solution for Question 16: Basic Assignment and Display**

#include <iostream> using namespace std; int main() {

int num;

// Assign a value using the assignment operator num = 25;

// Display the value

cout << "The value of num is: " << num << endl; return 0;

}

## Solution for Question 17: Increment and Assign

#include <iostream> using namespace std; int main() {

int num;

// Input a number

cout << "Enter a number: "; cin >> num;

// Add 10 using the += operator num += 10;

// Display the updated value

cout << "The updated value is: " << num << endl; return 0;

}

## Solution for Question 18: Subtract and Assign

#include <iostream> using namespace std; int main() {

int num;

// Input a number

cout << "Enter a number: "; cin >> num;

// Subtract 5 using the -= operator num -= 5;

// Display the updated value

cout << "The updated value is: " << num << endl; return 0;

}

## Solution for Question 19: Multiply and Assign

#include <iostream> using namespace std; int main() {

int num;

// Input a number

cout << "Enter a number: "; cin >> num;

// Multiply by 2 using the \*= operator num \*= 2;

// Display the updated value

cout << "The updated value is: " << num << endl; return 0;

}

## Solution for Question 20: Divide and Assign

#include <iostream> using namespace std; int main() {

double num1, num2;

// Input two numbers

cout << "Enter the first number: "; cin >> num1;

cout << "Enter the second number: "; cin >> num2;

// Check if the divisor is not zero if (num2 != 0) {

// Divide num1 by num2 using the /= operator num1 /= num2;

// Display the updated value

cout << "The updated value of the first number is: " << num1

<< endl;

} else {

cout << "Division by zero is not allowed!" << endl;

}

return 0;

}

**Solution for Question 21: Pre-increment Example**

#include <iostream> using namespace std; int main() {

int num;

// Input a number

cout << "Enter a number: "; cin >> num;

// Use pre-increment

++num;

// Display the result

cout << "The value after pre-increment is: " << num << endl; return 0;

}

## Solution for Question 22: Post-increment Example

#include <iostream> using namespace std; int main() {

int num;

// Input a number

cout << "Enter a number: "; cin >> num;

// Use post-increment

cout << "The value before post-increment is: " << num << endl; num++;

cout << "The value after post-increment is: " << num << endl; return 0;

}

**Solution for Question 23: Pre-decrement Example**

#include <iostream> using namespace std; int main() {

int num;

// Input a number

cout << "Enter a number: "; cin >> num;

// Use pre-decrement

--num;

// Display the result

cout << "The value after pre-decrement is: " << num << endl; return 0;

}

### Solution for Question 24: Post-decrement Example

#include <iostream> using namespace std; int main() {

int num;

// Input a number

cout << "Enter a number: "; cin >> num;

// Use post-decrement

cout << "The value before post-decrement is: " << num << endl; num--;

cout << "The value after post-decrement is: " << num << endl; return 0;

}

## Solution for Question 25: Increment and Decrement Combined

#include <iostream> using namespace std; int main() {

int num;

// Input a number

cout << "Enter a number: "; cin >> num;

// Perform increment and decrement

cout << "Original value: " << num << endl;

++num;

cout << "Value after pre-increment: " << num << endl; num--;

cout << "Value after post-decrement: " << num << endl; return 0;

}

# if-else statements :

## Solution for Question 26: Check Positive or Negative Number

#include <iostream> using namespace std; int main() {

int num;

// Input number

cout << "Enter a number: "; cin >> num;

// Check if positive, negative, or zero if (num > 0)

cout << "The number is positive." << endl; else if (num < 0)

cout << "The number is negative." << endl; else

cout << "The number is zero." << endl; return 0;

}

## Solution for Question 27: Odd or Even Check

#include <iostream> using namespace std; int main() {

int num;

// Input number

cout << "Enter a number: "; cin >> num;

// Check odd or even if (num % 2 == 0)

cout << "The number is even." << endl; else

cout << "The number is odd." << endl; return 0;

}

## Solution for Question 28: Check Maximum of Two Numbers

#include <iostream> using namespace std; int main() {

int num1, num2;

// Input two numbers

cout << "Enter two numbers: "; cin >> num1 >> num2;

// Find maximum if (num1 > num2)

cout << "The maximum is: " << num1 << endl; else

cout << "The maximum is: " << num2 << endl; return 0;

}

## Solution for Question 29: Grade Evaluation

#include <iostream> using namespace std; int main() {

int marks;

// Input marks

cout << "Enter your marks: "; cin >> marks;

// Determine grade if (marks >= 90)

cout << "Grade: A" << endl; else if (marks >= 80)

cout << "Grade: B" << endl; else if (marks >= 70)

cout << "Grade: C" << endl; else

cout << "Grade: Fail" << endl; return 0;

}

## Solution for Question 30: Leap Year Check

#include <iostream> using namespace std; int main() {

int year;

// Input year

cout << "Enter a year: "; cin >> year;

// Check leap year

if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) cout << year << " is a leap year." << endl;

else

cout << year << " is not a leap year." << endl; return 0;

}

## Solution for Question 31: Divisibility Check

#include <iostream> using namespace std; int main() {

int num;

// Input number

cout << "Enter a number: "; cin >> num;

// Check divisibility

if (num % 3 == 0 && num % 5 == 0)

cout << num << " is divisible by both 3 and 5." << endl; else

cout << num << " is not divisible by both 3 and 5." << endl; return 0;

}

## Solution for Question 32: Check Voting Eligibility

#include <iostream> using namespace std; int main() {

int age;

// Input age

cout << "Enter your age: "; cin >> age;

// Check voting eligibility if (age >= 18)

cout << "You are eligible to vote." << endl; else

cout << "You are not eligible to vote." << endl; return 0;

}

## Solution for Question 33: Check Alphabet Case

#include <iostream> using namespace std; int main() {

char ch;

// Input character

cout << "Enter a character: "; cin >> ch;

// Check case

if (ch >= 'A' && ch <= 'Z')

cout << ch << " is an uppercase letter." << endl; else if (ch >= 'a' && ch <= 'z')

cout << ch << " is a lowercase letter." << endl; else

cout << ch << " is not a letter." << endl; return 0;

}

## Solution for Question 34: Largest of Three Numbers

#include <iostream> using namespace std; int main() {

int num1, num2, num3;

// Input three numbers

cout << "Enter three numbers: "; cin >> num1 >> num2 >> num3;

// Find the largest number

if (num1 >= num2 && num1 >= num3)

cout << "The largest number is: " << num1 << endl; else if (num2 >= num1 && num2 >= num3)

cout << "The largest number is: " << num2 << endl; else

cout << "The largest number is: " << num3 << endl; return 0;

}

## Solution for Question 35: Check Pass/Fail

#include <iostream> using namespace std; int main() {

int marks;

// Input marks

cout << "Enter your marks: "; cin >> marks;

// Check pass or fail if (marks >= 40)

cout << "You have passed the exam." << endl; else

cout << "You have failed the exam." << endl; return 0;

}

**Switch Statements:**

**Solutions**

## Solution for Question 36: Day of the Week

#include <iostream> using namespace std; int main() {

int day;

// Input day number

cout << "Enter a number (1-7): "; cin >> day;

// Determine the day of the week switch (day) {

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 << "Invalid input!" << endl;

}

return 0;

}

## Solution for Question 37: Calculator

#include <iostream> using namespace std; int main() {

int choice;

double num1, num2, result;

// Input two numbers and the operation choice cout << "Enter two numbers: ";

cin >> num1 >> num2;

cout << "Choose an operation:\n1. Addition\n2. Subtraction\n3.

Multiplication\n4. Division\n"; cin >> choice;

// Perform operation based on choice switch (choice) {

case 1:

result = num1 + num2;

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

case 2:

result = num1 - num2;

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

case 3:

result = num1 \* num2;

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

case 4:

if (num2 != 0) {

result = num1 / num2;

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

} else {

cout << "Division by zero is not allowed!" << endl;

}

break; default:

cout << "Invalid choice!" << endl;

}

return 0;

}

## Solution for Question 38: Vowel or Consonant Check

#include <iostream> using namespace std; int main() {

char ch;

// Input character

cout << "Enter a letter: "; cin >> ch;

// Check if vowel or consonant switch (ch) {

case 'a': case 'e': case 'i': case 'o': case 'u':

case 'A': case 'E': case 'I': case 'O': case 'U': cout << ch << " is a vowel." << endl;

break; default:

cout << ch << " is a consonant." << endl;

}

return 0;

}

## Solution for Question 39: Month Name Display

#include <iostream> using namespace std; int main() {

int month;

// Input month number

cout << "Enter a number (1-12): "; cin >> month;

// Display the month name switch (month) {

case 1: cout << "January" << endl; break; case 2: cout << "February" << endl; break; case 3: cout << "March" << endl; break; case 4: cout << "April" << endl; break; case 5: cout << "May" << endl; break;

case 6: cout << "June" << endl; break; case 7: cout << "July" << endl; break; case 8: cout << "August" << endl; break;

case 9: cout << "September" << endl; break; case 10: cout << "October" << endl; break; case 11: cout << "November" << endl; break; case 12: cout << "December" << endl; break; default: cout << "Invalid input!" << endl;

}

return 0;

}

## Solution for Question 40: Simple Grading System

#include <iostream> using namespace std; int main() {

char grade;

// Input grade

cout << "Enter your grade (A, B, C, D, F): "; cin >> grade;

// Display message based on grade switch (grade) {

case 'A': case 'a':

cout << "Excellent!" << endl; break;

case 'B': case 'b':

cout << "Good!" << endl; break;

case 'C': case 'c':

cout << "Average." << endl; break;

case 'D': case 'd':

cout << "Below Average." << endl; break;

case 'F': case 'f':

cout << "Fail." << endl; break;

default:

cout << "Invalid grade!" << endl;

}

return 0;

}

### For Loop Concept:

**Questions Solutions**

**Solution for Question 41: Print Numbers from 1 to N**

#include <iostream> using namespace std; int main() {

int N;

// Input N

cout << "Enter a positive integer: "; cin >> N;

// Print numbers from 1 to N

cout << "Numbers from 1 to " << N << " are: "; for (int i = 1; i <= N; i++) {

cout << i << " ";

}

cout << endl; return 0;

}

## Solution for Question 42: Print Multiplication Table

#include <iostream> using namespace std; int main() {

int num;

// Input number

cout << "Enter a number: "; cin >> num;

// Print multiplication table

cout << "Multiplication table of " << num << ":" << endl; for (int i = 1; i <= 10; i++) {

cout << num << " x " << i << " = " << num \* i << endl;

}

return 0;

}

## Solution for Question 43: Sum of First N Natural Numbers

#include <iostream> using namespace std; int main() {

int N, sum = 0;

// Input N

cout << "Enter a positive integer: "; cin >> N;

// Calculate sum

for (int i = 1; i <= N; i++) { sum += i;

}

cout << "Sum of first " << N << " natural numbers is: " << sum << endl;

return 0;

}

## Solution for Question 44: Print Even Numbers from 1 to N

#include <iostream> using namespace std; int main() {

int N;

// Input N

cout << "Enter a positive integer: "; cin >> N;

// Print even numbers

cout << "Even numbers from 1 to " << N << " are: "; for (int i = 2; i <= N; i += 2) {

cout << i << " ";

}

cout << endl; return 0;

}

## Solution for Question 45: Factorial of a Number

#include <iostream> using namespace std; int main() {

int N;

unsigned long long factorial = 1;

// Input N

cout << "Enter a positive integer: "; cin >> N;

// Calculate factorial

for (int i = 1; i <= N; i++) { factorial \*= i;

}

cout << "Factorial of " << N << " is: " << factorial << endl; return 0;

}

**Variable Concept:**

**Solutions**

## Solution for Question 46: Simple Variable Declaration and Output

#include <iostream> using namespace std; int main() {

// Declare variables string name = "John Doe"; int age = 25;

string country = "India";

// Output variables

cout << "Name: " << name << endl; cout << "Age: " << age << endl;

cout << "Country: " << country << endl; return 0;

}

## Solution for Question 47: Area of a Rectangle

#include <iostream> using namespace std; int main() {

float length, width, area;

// Input length and width

cout << "Enter the length of the rectangle: "; cin >> length;

cout << "Enter the width of the rectangle: "; cin >> width;

// Calculate area

area = length \* width;

// Display area

cout << "The area of the rectangle is: " << area << endl; return 0;

}

## Solution for Question 48: Swap Two Numbers

#include <iostream> using namespace std; int main() {

int a, b, temp;

// Input two numbers

cout << "Enter the first number (a): "; cin >> a;

cout << "Enter the second number (b): "; cin >> b;

// Swap using a temporary variable temp = a;

a = b;

b = temp;

// Display swapped values

cout << "After swapping:" << endl; cout << "a = " << a << endl;

cout << "b = " << b << endl; return 0;

}

## Solution for Question 49: Simple Interest Calculation

#include <iostream> using namespace std; int main() {

float principal, rate, time, simpleInterest;

// Input principal, rate, and time

cout << "Enter the principal amount: "; cin >> principal;

cout << "Enter the rate of interest: "; cin >> rate;

cout << "Enter the time (in years): "; cin >> time;

// Calculate simple interest

simpleInterest = (principal \* rate \* time) / 100;

// Display result

cout << "The simple interest is: " << simpleInterest << endl; return 0;

}

## Solution for Question 50: Average of Three Numbers

#include <iostream> using namespace std; int main() {

float num1, num2, num3, average;

// Input three numbers

cout << "Enter the first number: "; cin >> num1;

cout << "Enter the second number: "; cin >> num2;

cout << "Enter the third number: "; cin >> num3;

// Calculate average

average = (num1 + num2 + num3) / 3;

// Display result

cout << "The average of the three numbers is: " << average << endl;

return 0;

}

# String Concept:

## Solution for Question 51: Concatenate Two Strings

#include <iostream> #include <string> using namespace std; int main() {

string str1, str2;

// Input two strings

cout << "Enter the first string: "; cin >> str1;

cout << "Enter the second string: "; cin >> str2;

// Concatenate strings string result = str1 + str2;

// Display the concatenated string

cout << "Concatenated string: " << result << endl; return 0;

}

## Solution for Question 52: Extract a Substring

#include <iostream> #include <string>

using namespace std; int main() {

string str;

int start, length;

// Input string

cout << "Enter a string: "; cin >> str;

// Input starting position and length for substring cout << "Enter the starting position: ";

cin >> start;

cout << "Enter the length of the substring: "; cin >> length;

// Extract substring

string substring = str.substr(start, length);

// Display the substring

cout << "The substring is: " << substring << endl; return 0;

}

## Solution for Question 53: Find the Length of a String

#include <iostream> #include <string> using namespace std; int main() {

string str;

// Input string

cout << "Enter a string: "; cin >> str;

// Find and display the length of the string

cout << "The length of the string is: " << str.length() << endl; return 0;

}

## Solution for Question 54: Convert a String to Uppercase

#include <iostream> #include <string> #include <cctype> using namespace std; int main() {

string str;

// Input string

cout << "Enter a string: "; cin >> str;

// Convert to uppercase

for (int i = 0; i < str.length(); i++) { str[i] = toupper(str[i]);

}

// Display the string in uppercase

cout << "String in uppercase: " << str << endl; return 0;

}

## Solution for Question 55: Convert a String to Lowercase

#include <iostream> #include <string> #include <cctype> using namespace std; int main() {

string str;

// Input string

cout << "Enter a string: "; cin >> str;

// Convert to lowercase

for (int i = 0; i < str.length(); i++) { str[i] = tolower(str[i]);

}

// Display the string in lowercase

cout << "String in lowercase: " << str << endl; return 0;

}

## Solution for Question 56: Check if String is Empty

#include <iostream> #include <string> using namespace std;

int main() {

string str;

// Input string

cout << "Enter a string: "; cin >> str;

// Check if the string is empty if (str.empty()) {

cout << "The string is empty." << endl;

} else {

cout << "The string is not empty." << endl;

}

return 0;

}

**Built in Functions:**

## Solution for Question 57: Find the Square Root of a Number

#include <iostream>

#include <cmath> // For sqrt() function using namespace std;

int main() {

double num;

// Input number

cout << "Enter a number: "; cin >> num;

// Calculate and display square root

cout << "The square root of " << num << " is: " << sqrt(num) << endl;

return 0;

}

## Solution for Question 58: Find the Power of a Number

#include <iostream>

#include <cmath> // For pow() function using namespace std;

int main() {

double base, exponent;

// Input base and exponent

cout << "Enter the base number: "; cin >> base;

cout << "Enter the exponent: "; cin >> exponent;

// Calculate and display power

cout << base << " raised to the power of " << exponent << " is: "

<< pow(base, exponent) << endl; return 0;

}

## Solution for Question 59: Find the Absolute Value of a Number

#include <iostream>

#include <cmath> // For abs() function using namespace std;

int main() {

int num;

// Input number

cout << "Enter a number: "; cin >> num;

// Calculate and display absolute value

cout << "The absolute value of " << num << " is: " << abs(num) << endl;

return 0;

}

## Solution for Question 60: Find the Maximum of Two Numbers

#include <iostream>

#include <algorithm> // For max() function using namespace std;

int main() {

int num1, num2;

// Input two numbers

cout << "Enter the first number: "; cin >> num1;

cout << "Enter the second number: "; cin >> num2;

// Find and display maximum

cout << "The maximum of " << num1 << " and " << num2 << " is: "

<< max(num1, num2) << endl; return 0;

}

## Solution for Question 61: Find the Minimum of Two Numbers

#include <iostream>

#include <algorithm> // For min() function using namespace std;

int main() {

int num1, num2;

// Input two numbers

cout << "Enter the first number: "; cin >> num1;

cout << "Enter the second number: "; cin >> num2;

// Find and display minimum

cout << "The minimum of " << num1 << " and " << num2 << " is: " << min(num1, num2) << endl;

return 0;

}

**User-defined functions:**

## Solution for Question 62: Find the Factorial of a Number

#include <iostream> using namespace std;

// User-defined function to calculate factorial int factorial(int n) {

int fact = 1;

for (int i = 1; i <= n; i++) { fact \*= i;

}

return fact;

}

int main() {

int num;

// Input number

cout << "Enter a number: "; cin >> num;

// Call the factorial function

cout << "The factorial of " << num << " is: " << factorial(num)

<< endl;

return 0;

}

## Solution for Question 63: Check Even or Odd

#include <iostream> using namespace std;

// User-defined function to check even or odd void checkEvenOdd(int n) {

if (n % 2 == 0) {

cout << n << " is even." << endl;

} else {

cout << n << " is odd." << endl;

}

}

int main() {

int num;

// Input number

cout << "Enter a number: "; cin >> num;

// Call the checkEvenOdd function checkEvenOdd(num);

return 0;

}

## Solution for Question 64: Calculate the Area of a Circle

#include <iostream>

#include <cmath> // For M\_PI constant using namespace std;

// User-defined function to calculate area of circle double areaOfCircle(double radius) {

return M\_PI \* radius \* radius;

}

int main() {

double radius;

// Input radius

cout << "Enter the radius of the circle: "; cin >> radius;

// Call the areaOfCircle function

cout << "The area of the circle is: " << areaOfCircle(radius) << endl;

return 0;

}

## Solution for Question 65: Find the Maximum of Three Numbers

#include <iostream> using namespace std;

// User-defined function to find maximum of three numbers int findMax(int a, int b, int c) {

if (a > b && a > c) { return a;

} else if (b > c) { return b;

} else {

return c;

}

}

int main() {

int num1, num2, num3;

// Input three numbers

cout << "Enter three numbers: "; cin >> num1 >> num2 >> num3;

// Call the findMax function

cout << "The maximum of the three numbers is: " << findMax(num1, num2, num3) << endl;

return 0;

}

**File handling -Text File:**

## Solution for Question 66: Write to a Text File

#include <iostream>

#include <fstream> // For file handling #include <string>

using namespace std; int main() {

string text;

ofstream outFile("output.txt"); // Create and open a text file for writing

if (!outFile) { // Check if the file is open cout << "Error opening file!" << endl; return 1;

}

// Input text from user

cout << "Enter text to save to the file: "; getline(cin, text);

// Write text to the file outFile << text << endl;

// Close the file outFile.close();

cout << "Text written to the file successfully!" << endl; return 0;

}

## Solution for Question 67: Read from a Text File

#include <iostream>

#include <fstream> // For file handling #include <string>

using namespace std; int main() {

string line;

ifstream inFile("output.txt"); // Open the text file for reading if (!inFile) { // Check if the file is open

cout << "Error opening file!" << endl; return 1;

}

// Read content of the file and display it cout << "Contents of the file are: " << endl;

while (getline(inFile, line)) { // Read each line from the file cout << line << endl;

}

// Close the file inFile.close(); return 0;

}

**File-Handling Binary File:**

## Solution for Question 68: Write to a Binary File

#include <iostream>

#include <fstream> // For binary file handling using namespace std;

int main() {

int num;

ofstream outFile("numbers.dat", ios::binary); // Open a binary file for writing

if (!outFile) { // Check if the file opened successfully cout << "Error opening file!" << endl;

return 1;

}

// Input integers from the user

cout << "Enter 3 integers to save to the binary file: "; for (int i = 0; i < 3; i++) {

cin >> num;

outFile.write(reinterpret\_cast<char\*>(&num), sizeof(num));

// Write the integer as binary

}

// Close the binary file outFile.close();

cout << "Data written to the binary file successfully!" << endl; return 0;

}

## Solution for Question 69: Read from a Binary File

#include <iostream>

#include <fstream> // For binary file handling using namespace std;

int main() {

int num;

ifstream inFile("numbers.dat", ios::binary); // Open a binary file for reading

if (!inFile) { // Check if the file opened successfully cout << "Error opening file!" << endl;

return 1;

}

// Read integers from the binary file

cout << "The numbers in the binary file are: " << endl;

while (inFile.read(reinterpret\_cast<char\*>(&num), sizeof(num))) {

// Read data from the file

cout << num << endl;

}

// Close the binary file inFile.close();

return 0;

}

**Error Handling in File Operations**

### Solution

**70. Simplified Program for Error Handling in File Operations**

#include <iostream>

#include <fstream> // For file handling using namespace std;

int main() {

// Open the file for writing ofstream outFile("example.txt");

// Check if the file is open if (!outFile) {

cout << "Error opening the file!" << endl;

return 1; // Exit the program if the file can't be opened

}

// Write some text to the file

outFile << "This is a simple example of file handling." << endl;

// Close the file outFile.close();

cout << "Data written to the file successfully!" << endl;

return 0;

}

## Exception handling:

**Solution for Question 71: Handle Division by Zero**

#include <iostream>

#include <stdexcept> // For exceptions using namespace std;

int main() {

double num1, num2;

cout << "Enter two numbers: "; cin >> num1 >> num2;

try {

if (num2 == 0) {

throw runtime\_error("Error: Division by zero!");

}

cout << "The result is: " << num1 / num2 << endl;

} catch (const runtime\_error& e) { cout << e.what() << endl;

}

return 0;

}

**Solution for Question 72: Handle Invalid Input**

#include <iostream>

#include <stdexcept> // For exceptions using namespace std;

int main() {

int num;

cout << "Enter an integer: ";

try {

if (!(cin >> num)) {

throw runtime\_error("Error: Invalid input, not an

integer.");

}

cout << "You entered: " << num << endl;

} catch (const runtime\_error& e) { cout << e.what() << endl;

}

return 0;

}

## Solution for Question 73: Handle File Not Found

#include <iostream> #include <fstream>

#include <stdexcept> // For exceptions using namespace std;

int main() {

ifstream inFile("nonexistent.txt"); try {

if (!inFile) {

throw runtime\_error("Error: File not found!");

}

cout << "File opened successfully!" << endl;

} catch (const runtime\_error& e) { cout << e.what() << endl;

}

return 0;

}

## Solution for Question 74: Handle Negative Age Input

#include <iostream>

#include <stdexcept> // For exceptions using namespace std;

int main() {

int age;

cout << "Enter your age: "; cin >> age;

try {

if (age < 0) {

throw invalid\_argument("Error: Age cannot be negative!");

}

cout << "Your age is: " << age << endl;

} catch (const invalid\_argument& e) { cout << e.what() << endl;

}

return 0;

}

# classes, structures, and inheritance:

## Solution for Question 75: Basic Class Definition and Object Creation

#include <iostream> #include <string> using namespace std; class Person { public:

string name; int age;

void display() {

cout << "Name: " << name << endl; cout << "Age: " << age << endl;

}

};

int main() {

Person person1; // Creating an object of class Person person1.name = "John Doe";

person1.age = 25;

person1.display(); // Calling the display function return 0;

}

## Solution for Question 76: Using Structures for Storing Data

#include <iostream> #include <string> using namespace std; struct Student {

string name; int rollNo; float marks;

};

int main() {

Student student1; *// Creating an instance of Student structure*

student1.name = "Alice"; student1.rollNo = 101;

student1.marks = 85.5;

cout << "Name: " << student1.name << endl;

cout << "Roll Number: " << student1.rollNo << endl; cout << "Marks: " << student1.marks << endl; return 0;

}

## Solution for Question 77: Simple Inheritance

#include <iostream> #include <string> using namespace std; class Animal { public:

string name;

void display() {

cout << "Animal name: " << name << endl;

}

};

class Dog : public Animal { public:

void bark() {

cout << name << " says Woof!" << endl;

}

};

int main() {

Dog dog1;

dog1.name = "Buddy";

dog1.display();

dog1.bark(); // Calling method of derived class return 0;

}

## Solution for Question 78: Using Constructor in a Class

#include <iostream> #include <string> using namespace std; class Car {

public:

string brand; string model;

// Constructor to initialize the attributes Car(string b, string m) {

brand = b; model = m;

}

void display() {

cout << "Car Brand: " << brand << endl; cout << "Car Model: " << model << endl;

}

};

int main() {

Car car1("Toyota", "Corolla"); // Creating an object with constructor

car1.display(); return 0;

}

## Solution for Question 79: Inheritance with Constructor

#include <iostream> #include <string> using namespace std; class Vehicle { public:

string type;

// Constructor of base class Vehicle(string t) {

type = t;

}

};

class Bike : public Vehicle { public:

string brand;

// Constructor of derived class Bike(string t, string b) : Vehicle(t) {

brand = b;

}

void display() {

cout << "Vehicle Type: " << type << endl; cout << "Bike Brand: " << brand << endl;

}

};

int main() {

Bike bike1("Two-Wheeler", "Yamaha"); bike1.display();

return 0;

}

## Solution for Question 80: Using Structures and Functions

#include <iostream> #include <string> using namespace std; struct Book {

string title; string author;

};

void displayBookDetails(Book b) {

cout << "Title: " << b.title << endl; cout << "Author: " << b.author << endl;

}

int main() {

Book book1 = {"C++ Programming", "Bjarne Stroustrup"}; displayBookDetails(book1); // Passing structure to function return 0;

}