SET 11

Q1: Write a program to check if a number entered by the user is positive, negative, or zero..(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

using namespace std;

int main() {

// Declare a variable to store the user input

float number;

// Prompt the user to enter a number

cout << "Enter a number: ";

cin >> number;

// Check if the number is positive, negative, or zero

if (number > 0) {

cout << "The number is positive." << endl;

} else if (number < 0) {

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

} else {

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

}

return 0;

}

Q2Write a program to check if a student passes an exam. A student passes if their marks are 40 or above.(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

using namespace std;

int main() {

int marks;

// Ask user for input marks

cout << "Enter the student's marks: ";

cin >> marks;

// Check if the student has passed

if (marks >= 40) {

cout << "The student has passed the exam!" << endl;

} else {

cout << "The student has failed the exam!" << endl;

}

return 0;

}

Q3: Write a program to input a character and check if it is a vowel (a, e, i, o, u) or a consonant using a switch statement.(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

using namespace std;

int main() {

char ch;

// Ask user for input character

cout << "Enter a character: ";

cin >> ch;

// Convert the character to lowercase to handle both uppercase and lowercase inputs

ch = tolower(ch);

// Use switch case to check if the character is a vowel or consonant

switch (ch) {

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;

}

SET 12

Q1 : Write a program to input a number and print its multiplication table up to 10 using a for loop.(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

using namespace std;

int main() {

int number;

// Ask the user to input a number

cout << "Enter a number: ";

cin >> number;

// Loop to print multiplication table from 1 to 10

for (int i = 1; i <= 10; i++) {

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

}

return 0;

}

Q2 :Write a program to swap the values of two variables and display the result(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

using namespace std;

int main() {

int a, b, temp;

// Ask user to input two numbers

cout << "Enter the value of a: ";

cin >> a;

cout << "Enter the value of b: ";

cin >> b;

// Swapping values using a temporary variable

temp = a;

a = b;

b = temp;

// Display the result after swapping

cout << "After swapping, the value of a is: " << a << endl;

cout << "After swapping, the value of b is: " << b << endl;

return 0;

}

Q3 Write a program to input a string and extract a substring from it (starting from a specified position for a specified length).(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

#include <string>

using namespace std;

int main() {

string str;

int start, length;

// Input the string

cout << "Enter a string: ";

getline(cin, str);

// Input the starting position and length of the substring

cout << "Enter the starting position: ";

cin >> start;

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

cin >> length;

// Check if the starting position and length are valid

if (start >= 0 && start < str.length() && length > 0 && (start + length) <= str.length()) {

// Extract the substring using the substr() method

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

// Display the extracted substring

cout << "Extracted substring: " << substring << endl;

} else {

cout << "Invalid starting position or length." << endl;

}

return 0;

}

Set 13

Q1 Write a program to input two numbers and find the minimum using the min() function.(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

#include <algorithm> // For the 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 the minimum using the min() function

int minimum = min(num1, num2);

// Output the minimum value

cout << "The minimum of " << num1 << " and " << num2 << " is: " << minimum << endl;

return 0;

}

Q2 Write a program to input some text from the user and save it to a text file.(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

#include <fstream> // For file handling

#include <string>

using namespace std;

int main() {

string text;

ofstream outFile; // Create an output file stream object

// Ask user for the text input

cout << "Enter some text: ";

getline(cin, text); // Get the entire line of input, including spaces

// Open the file in write mode (it creates the file if it doesn't exist)

outFile.open("output.txt");

// Check if the file is opened successfully

if (outFile.is\_open()) {

// Write the input text to the file

outFile << text;

// Close the file after writing

outFile.close();

cout << "Text has been saved to 'output.txt'." << endl;

} else {

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

}

return 0;

}

Q3 Write a program to convert a given string to uppercase without using the built-in upper() function.(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

#include <string>

using namespace std;

int main() {

string str;

// Ask the user for input string

cout << "Enter a string: ";

getline(cin, str);

// Convert each character to uppercase if it's a lowercase letter

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

if (str[i] >= 'a' && str[i] <= 'z') {

str[i] = str[i] - ('a' - 'A'); // Convert to uppercase

}

}

// Output the converted string

cout << "The string in uppercase is: " << str << endl;

return 0;

}

Set 14

Q1 Write a program to find whether a given year is a leap year.(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

using namespace std;

int main() {

int year;

// Input the year from the user

cout << "Enter a year: ";

cin >> year;

// Check if the year is a leap year

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

cout << year << " is a leap year." << endl;

} else {

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

}

return 0;

}

Q2 :Write a program to input some text from the user and save it to a text file.(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

#include <fstream> // For file handling

#include <string>

using namespace std;

int main() {

string text;

ofstream outFile; // Create an output file stream object

// Ask user for the text input

cout << "Enter some text: ";

getline(cin, text); // Get the entire line of input, including spaces

// Open the file in write mode (it creates the file if it doesn't exist)

outFile.open("output.txt");

// Check if the file is opened successfully

if (outFile.is\_open()) {

// Write the input text to the file

outFile << text;

// Close the file after writing

outFile.close();

cout << "Text has been saved to 'output.txt'." << endl;

} else {

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

}

return 0;

}

Q3 C:Write a program to read integers from a binary file and display them on the screen..(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

#include <fstream> // For file handling

using namespace std;

int main() {

ifstream inFile; // Create an input file stream object

int number;

// Open the binary file in input mode

inFile.open("numbers.bin", ios::in | ios::binary);

// Check if the file was opened successfully

if (!inFile) {

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

return 1;

}

// Read and display the integers from the file

cout << "The integers read from the binary file are:" << endl;

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

cout << number << endl;

}

// Close the file

inFile.close();

return 0;

}

Set 15

Q1 : Write a program to convert a temperature from Celsius to Fahrenheit using the formula: F = \frac{9}{5}C + 32 .6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks

#include <iostream>

using namespace std;

int main() {

double celsius, fahrenheit;

// Input temperature in Celsius

cout << "Enter temperature in Celsius: ";

cin >> celsius;

// Convert Celsius to Fahrenheit

fahrenheit = (9.0 / 5.0) \* celsius + 32;

// Output the result

cout << celsius << " Celsius is equal to " << fahrenheit << " Fahrenheit." << endl;

return 0;

}

Q2 Write a program to calculate the average of five numbers entered by the user..(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks

#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 the average

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

// Output the average

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

return 0;

}

Q3 : Write a program to input a number and use the -= operator to subtract 5 from the number, then display the updated value.(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

using namespace std;

int main() {

int number;

// Input a number from the user

cout << "Enter a number: ";

cin >> number;

// Subtract 5 from the number using the -= operator

number -= 5;

// Display the updated value

cout << "The updated value after subtracting 5 is: " << number << endl;

return 0;

}

Set 16

Q1 Write a program to calculate the sum of all numbers from 1 to n using recursion.(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

using namespace std;

// Recursive function to calculate sum from 1 to n

int sum(int n) {

// Base case: if n is 1, return 1

if (n == 1) {

return 1;

}

// Recursive case: sum of n is n + sum of n-1

return n + sum(n - 1);

}

int main() {

int n;

// Input the value of n

cout << "Enter a number n: ";

cin >> n;

// Call the recursive function to calculate the sum

int result = sum(n);

// Output the result

cout << "The sum of numbers from 1 to " << n << " is: " << result << endl;

return 0;

}

Q2 :Write a program to find the product of three numbers entered by the user.(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

using namespace std;

int main() {

double num1, num2, num3, product;

// Input three numbers from the user

cout << "Enter three numbers: ";

cin >> num1 >> num2 >> num3;

// Calculate the product of the three numbers

product = num1 \* num2 \* num3;

// Output the product

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

return 0;

}

Q3 : Write a program to calculate the average of five numbers entered by the user.(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

using namespace std;

int main() {

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

// Input five numbers from the user

cout << "Enter five numbers: ";

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

// Calculate the average

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

// Output the average

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

return 0;

}

Set 17

Q1 Write a program to check if a person is eligible to vote. The person must be at least 18 years old and a citizen of the country.(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

#include <string>

using namespace std;

int main() {

int age;

string citizenship;

// Input the age and citizenship status

cout << "Enter your age: ";

cin >> age;

cout << "Are you a citizen of the country? (yes/no): ";

cin >> citizenship;

// Check if the person is eligible to vote

if (age >= 18 && (citizenship == "yes" || citizenship == "Yes")) {

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

} else {

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

}

return 0;

}

Q2 : Write a program to check if a given number lies within a specific range (e.g., between 10 and 50 inclusive)..(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

using namespace std;

int main() {

int num;

// Input a number from the user

cout << "Enter a number: ";

cin >> num;

// Check if the number lies within the range 10 to 50 inclusive

if (num >= 10 && num <= 50) {

cout << "The number is within the range of 10 to 50." << endl;

} else {

cout << "The number is outside the range of 10 to 50." << endl;

}

return 0;

}

Q3 : Write a program to input two integers and display their quotient and remainder.(6Marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

using namespace std;

int main() {

int num1, num2;

// Input two integers from the user

cout << "Enter two integers: ";

cin >> num1 >> num2;

// Check if the second number is not zero to avoid division by zero

if (num2 != 0) {

// Calculate the quotient and remainder

int quotient = num1 / num2;

int remainder = num1 % num2;

// Display the quotient and remainder

cout << "Quotient: " << quotient << endl;

cout << "Remainder: " << remainder << endl;

} else {

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

}

return 0;

}

Set 18

Q1 : Write a program to calculate the factorial of a number using iteration.(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

using namespace std;

int main() {

int num;

long long factorial = 1; // Use long long to handle large numbers

// Input a number from the user

cout << "Enter a number: ";

cin >> num;

// Check if the number is negative

if (num < 0) {

cout << "Factorial is not defined for negative numbers." << endl;

} else {

// Calculate factorial using iteration

for (int i = 1; i <= num; i++) {

factorial \*= i;

}

// Output the factorial

cout << "The factorial of " << num << " is: " << factorial << endl;

}

return 0;

}

Q2 : Write a program to calculate the average of five numbers entered by the user.(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

using namespace std;

int main() {

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

// Input five numbers from the user

cout << "Enter five numbers: ";

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

// Calculate the average

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

// Output the average

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

return 0;

}

Q3 Write a program to check if a number entered by the user is positive, negative, or zero.6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

using namespace std;

int main() {

int num;

// Input a number from the user

cout << "Enter a number: ";

cin >> num;

// Check if the number is 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;

}

Set 19

Q1 : Write a program to check if a year entered by the user is a leap year.(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

using namespace std;

int main() {

int year;

// Input the year from the user

cout << "Enter a year: ";

cin >> year;

// Check if the year is a 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;

}

Q2 Write a program to input a number (1 to 7) and display the corresponding day of the week using a switch statement..(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

using namespace std;

int main() {

int day;

// Input a number between 1 and 7 from the user

cout << "Enter a number (1 to 7): ";

cin >> day;

// Display the corresponding day of the week using a switch statement

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! Please enter a number between 1 and 7." << endl;

}

return 0;

}

Q3 Write a program to input a number (1 to 12) and display the corresponding month name using a switch statement (6Marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks

#include <iostream>

using namespace std;

int main() {

int month;

// Input a number between 1 and 12 from the user

cout << "Enter a number (1 to 12): ";

cin >> month;

// Display the corresponding month name using a switch statement

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! Please enter a number between 1 and 12." << endl;

}

return 0;

}

Set 20

Q1 A: Write a program to check if a number entered by the user is positive, negative, or zero. or not.(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks)

#include <iostream>

using namespace std;

int main() {

int num;

// Input a number from the user

cout << "Enter a number: ";

cin >> num;

// Check if the number is 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;

}

Q2 Write a program to find the largest number in 3 numbers(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks

#include <iostream>

using namespace std;

int main() {

int num1, num2, num3;

// Input three numbers from the user

cout << "Enter three numbers: ";

cin >> num1 >> num2 >> num3;

// Determine 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;

}

Q3 Write a program to print the multiplication table of a number.(6 marks) Write the breakdown for the above program (2 marks) Give 2 possible input/ output cases (2 marks

#include <iostream>

using namespace std;

int main() {

int num;

// Input the number from the user

cout << "Enter a number to print its multiplication table: ";

cin >> num;

// Print the multiplication table for the entered number

cout << "Multiplication table of " << num << " is:" << endl;

for (int i = 1; i <= 10; i++) {

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

}

return 0;

}