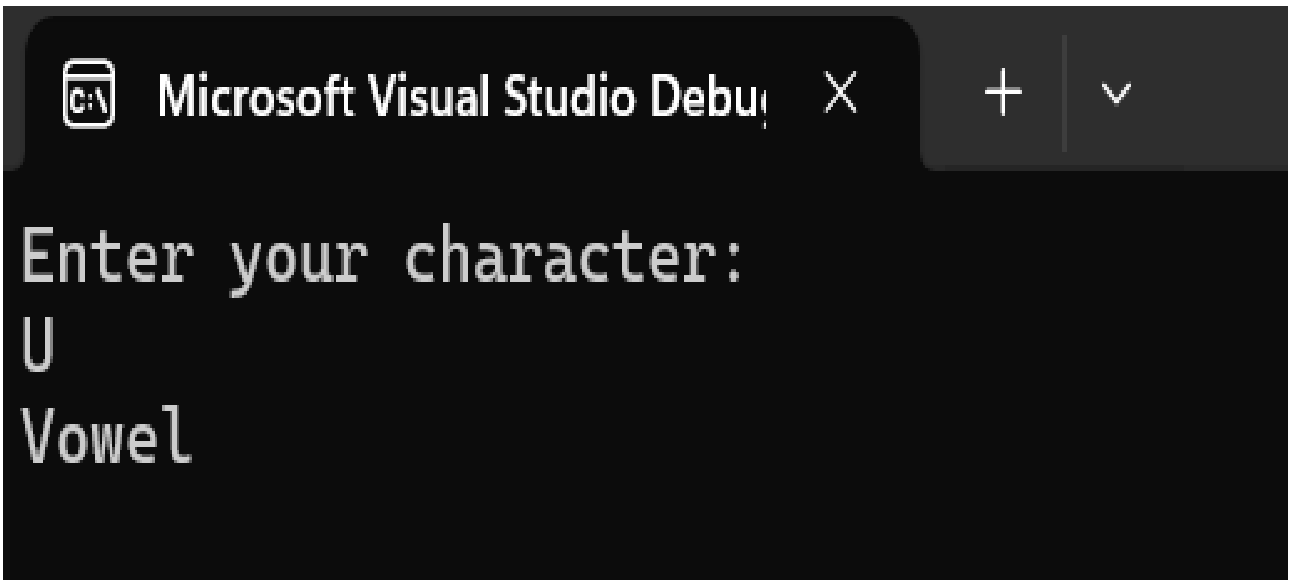
Q1. Write a C++ program that uses if–else statements to check whether a given character entered by the user is a vowel or not a vowel. The program should take one character as input and display:

• "is a vowel" if the entered character is a, e, i, o, or u (in either uppercase or lowercase),

• otherwise, display "is not a vowel".

Solution:

```
#include <iostream>

using namespace std;

int main()

{

	char s;

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

	cin >> s;

	if (s == 'a' || s == 'A') {

		cout << "Vowel" << endl;

	}

	 else if ( s == 'e' || s == 'E') {

		cout << "Vowel" << endl;

	}

	 else if (s == 'i' || s == 'I') {

		cout << "Vowel" << endl;

	}

	 else if (s == 'o' || s == 'O') {

		cout << "Vowel" << endl;

	}

	 else if(s == 'u' || s == 'U') {

		cout << "Vowel" << endl;

	}

				else

					cout << "It is not a Vowel" << endl;

					return 0;


}
```


Microsoft Visual Studio Debu
Enter your character:
U
Vowel

Q2. Write a C++ program that takes the temperature as input from the user and displays a message according to the following conditions:

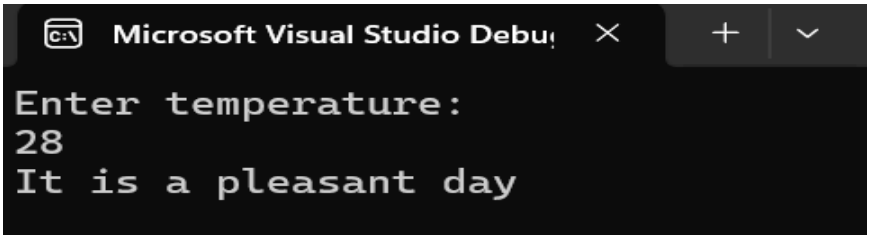
• If the temperature is greater than 35, display “It is a hot day.”

• If the temperature is between 25 and 35 (inclusive), display “It is a pleasant day.”

• If the temperature is less than 25, display “It is a cool day.”

Solution:

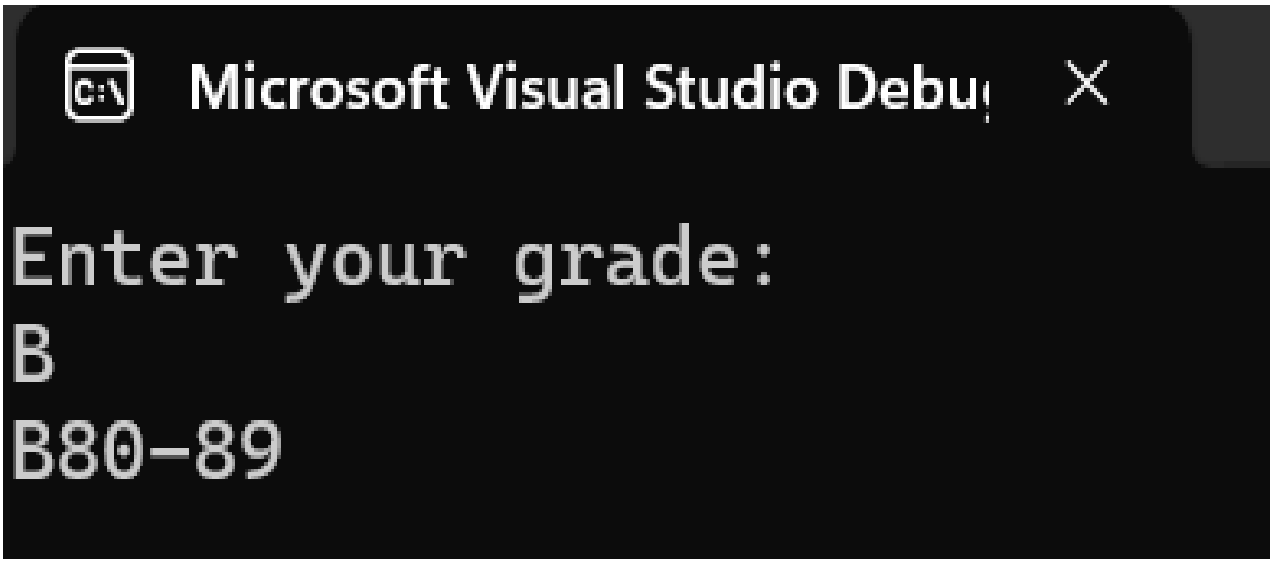
```
#include <iostream>

using namespace std;

int main()

{

	int temp;

	cout << "Enter temperature:" << endl;

	cin >> temp;

	if (temp >= 35) {

		cout << "It is a hot day" << endl;

	}

	else if (temp <= 25) {

		cout << "It is a cool day" << endl;

	}

	else if (temp > 25 || temp < 35) {

		cout << "It is a pleasant day" << endl;

	}


	return 0;

}
```



Q3. Write a program that inputs grade of a student and display his test score on the following criteria: Test Score Grade Test Score >= 90 A >= 90 80 – 89 B 80 – 89 70 – 79 C 70 – 79 60 – 69 D 60 – 69 Below 60 F Below 60

Solution:

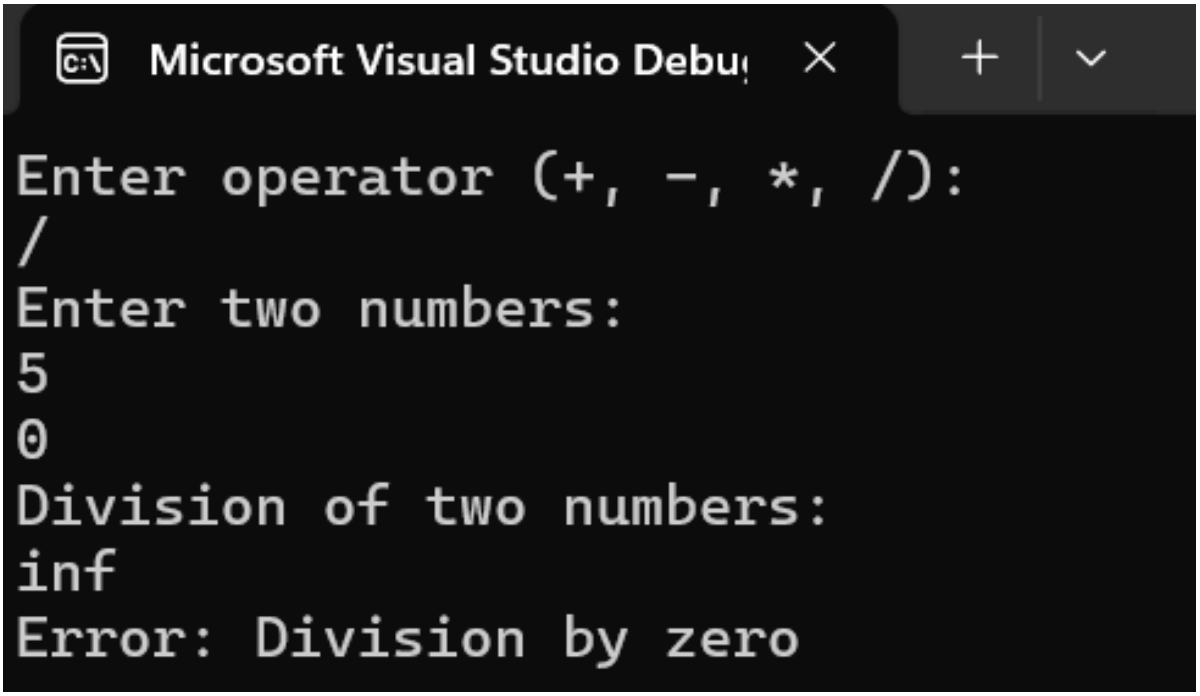
```
#include <iostream>

using namespace std;

int main()

{

	char g;

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

	cin >> g;

	switch (g) {

	case 'a': case 'A':

		cout << g << "<=90" << endl;

		break;

	case 'b':case 'B':

		cout << g << "80-89" << endl;

		break;

	case 'c':case'C':

		cout << g << "70-79" << endl;

		break;

	case 'd':case'D':

		cout << g << "60-69" << endl;

		break;

	case 'f':case'F':

		cout << g << "Below 60" << endl;

		break;

	default:

		cout << "Fail" << endl;



	}

	return 0;

}
```


Microsoft Visual Studio Debu
Enter your grade:
B
B80-89

Q4.Write a program that perform 4 operators tasks (+,-,*,/) of two numbers means calculator for two numbers.

Solution:

```
#include<iostream>
using namespace std;
int main()
{
   char op;
   float num1, num2;
   cout << "Enter operator (+, -, *, /): " << endl;
   cin >> op;
   cout << "Enter two numbers: " << endl;
   cin >> num1 >> num2;
   switch (op) {
   case '+':
      cout << "Addition of two numbers:\n" << num1 + num2 << endl;
      break;
   case '-':
      cout << "Subtraction of two numbers:\n" << num1 - num2 << endl;
      break;
   case '*':
      cout << "Product of two numbers:\n" << num1 * num2 << endl;
      break;
   case '/':
      cout << "Division of two numbers:\n" << num1 / num2 << endl;
      if (num2 == 0) {
         cout << "Error: Division by zero" << endl;
      }
      break;
   default:
      cout << "Invalid operator" << endl;
   }
   return 0;
}
```


Microsoft Visual Studio Debu
Enter operator (+, -, *, /):
/
Enter two numbers:
5
0
Division of two numbers:
inf
Error: Division by zero

Q5. Create a Calculator using the switch Statement 1. Write a program to provide following functionality of a calculator using switch case statement.

- Addition of two integers
- Subtraction of two integers
- Multiplication of two integers
- Division of two integers
- Addition of two Floating Point Numbers
- Subtraction of two Floating Point Numbers
- Multiplication of two Floating Point Numbers
- Division of two Floating Point Numbers
- Sine
- Cosine
- Tangent
- Square root
- Square
- Cube

User should be able to select his desired operation from the Menu given to him.

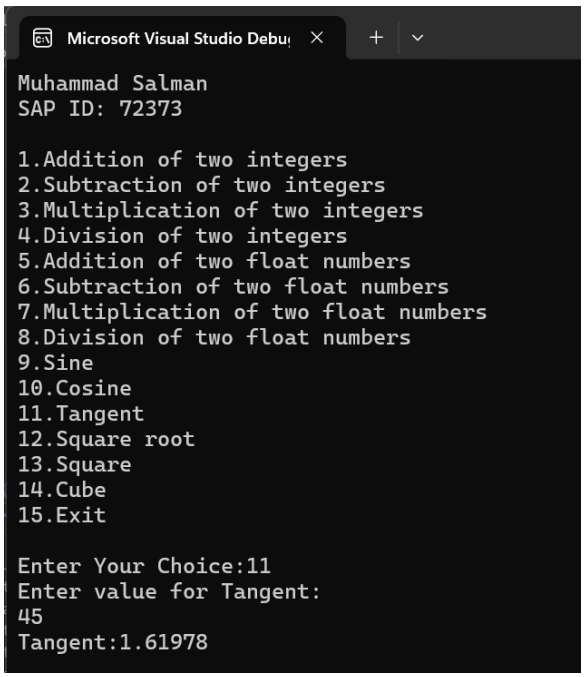
The program should only terminate when user selects exit operation from the MENU. For sine, cosine, Tangent and Square root you can use functions available in math.h library.

Solution:

```
#include <iostream>

#include<cmath>//we use this for sine,cosine,squareroot and tangent.

using namespace std;

int main() {
	int your_choice;
	int n1, n2;
	float v1, v2;


	cout << "Muhammad Salman\nSAP ID: 72373\n";
	cout << "\n1.Addition of two integers\n";
	cout << "2.Subtraction of two integers\n";
	cout << "3.Multiplication of two integers\n";
	cout << "4.Division of two integers\n";
	cout << "5.Addition of two float numbers\n";
	cout << "6.Subtraction of two float numbers\n";
	cout << "7.Multiplication of two float numbers\n";
	cout << "8.Division of two float numbers\n";
	cout << "9.Sine\n";
	cout << "10.Cosine\n";
	cout << "11.Tangent\n";
```

```
        cout << "12.Square root\n";
        cout << "13.Square\n";
        cout << "14.Cube\n";
        cout << "15.Exit\n";

        cout << "\nEnter Your Choice:";
        cin >> your_choice;

        switch (your_choice) {
        case 1:
                cout << "Enter two integers:\n";
                cin >> n1 >> n2;
                cout << "Result:" << n1 + n2 << endl;
                break;
        case 2:
                cout << "Enter two integers:\n";
                cin >> n1 >> n2;
                cout << "Result:" << n1 - n2 << endl;
                break;
        case 3:
                cout << "Enter two integers:\n";
                cin >> n1 >> n2;
                cout << "Result:" << n1 * n2 << endl;
        case 4:
                cout << "Enter two integers:\n";
                cin >> n1 >> n2;
                if (n2 != 0)
                        cout << "Result:" << n1 / n2
<< endl;
                else
                        cout << "Error! Try another
number\n";
                break;
        case 5:
                cout << "Enter two float numbers:\n";
                cin >> v1 >> v2;
                cout << "Result:" << v1 + v2 << endl;
                break;
        case '6':
                cout << "Enter two float numbers:\n";
                cin >> v1 >> v2;
                cout << "Result:" << v1 - v2 << endl;
                break;
        case 7:
                cout << "Enter two float numbers:\n";
                cin >> v1 >> v2;
                cout << "Result:" << v1 * v2 << endl;
                break;
        case 8:
                cout << "Enter two float numbers:\n";
                cin >> v1 >> v2;
                if (v2 != 0)
                        cout << "Result:" << v1 / v2
<< endl;
                else
                        cout << "Error! Try another
number\n";
                break;
        case 9:
                cout << "Enter value for Sine:\n";
                cin >> v1;
                cout << "Sine:" << sin(v1) << endl;
                break;
        case 10:
                cout << "Enter value for Cosine:\n";
                cin >> v1;
                cout << "Cosine:" << cos(v1) << endl;
                break;
        case 11:
                cout << "Enter value for Tangent:\n";
```

```
                cin >> v1;
                cout << "Tangent:" << tan(v1) << endl;
                break;
        case 12:
                cout << "Enter number for Square
Root\n";
                cin >> v1;
                cout << "Square Root:" << sqrt(v1) <<
endl;
                break;
        case 13:
                cout << "Enter number for Square:\n";
                cin >> v1;
                cout << "Square:" << v1 * v1 << endl;
                break;
        case 14:
                cout << "Enter number for Cube:\n";
                cin >> v1;
                cout << "Cube:" << v1 * v1 * v1 <<
endl;
                break;
        case 15:
                cout << "Exiting the Calculator..." <<
endl;
                break;
        default:
                cout << "\nYour Choice Is Invalid!
Please Try Again ";

        }
        return 0;

}
```



Q5. 2. Write a program that takes as input any number of seconds (as int) and then converts it in hours, minutes and seconds.

For example, if you enter 7802 the program should print:

2 hrs 10 mins 2 secs

(Hint: Use integer division and modulus operators)

Solution:

```
#include <iostream>

using namespace std;

int main() {

	cout << "Muhammad Salman\nSAP ID: 72373\n";

	int num,hours,min,sec;

	cout << "\nEnter Number:\n";

	cin >> num;

	hours = num /3600;

	min = hours / 60;

	sec = min / 60;

	cout << hours << "hrs" << min << "mins" << sec << "secs";

	return 0;


}
```