Home Work No.5

4th October 2022

Content:

1) Two Way Selector
    a. If Else statement (Revision)
    b. Ternary operator
2) Multi-Selector
    a. If else if statement
    b. Switch statement
3) Practice Codes

//////////……PART-1A ……/////////

```
//…….. 1.cpp ……..

#include <iostream>

using namespace std;

// function main begins program execution
int main() {


        if (cout << 0)
        {
                cout << "Hello";

        }
        else
        {
                cout << "Not Hello";
        }
return 0;
}
```

```
//.....2.cpp

#include <iostream>
 using namespace std;

int main()
{
 int number;

        cout << "Enter an integer and I will tell you if it\n";
        cout << "is odd or even. ";
        cin >> number;
        if (number % 2 == 0)
                cout << number << " is Odd.\n";
        else
                cout << number << " is Even.\n";
return 0;
}
```

```
//……..3.cpp…….

#include <iostream>

using namespace std;

int main ()

{

        int grade;

        cout<<"\nEnter Value of Grade ::";

        cin>>grade;

        if ( grade >= 60 )

              cout << "Passed";

        else

              cout << "Failed";

          return 0; // indicate that program ended successfully

}
```

```
//……..9.cpp……..

///////////////using of ternary conditional operator//////////
#include <iostream>
using namespace std;
int main()
{
  int grade;
  cout<<"\nEnter Value of Grade ::";
  cin>>grade;

  cout << (grade>=60? "\nPassed\n":"\nFailed\n");
 return 0; // indicate that program ended successfully
}
```

```
//……1.cpp……..
#include <iostream>

using namespace std;
int main ()
{
        int n1,n2;
        cout<<"\nEnter two integers";
        cin>>n1>>n2;
        cout<<(n1>n2?"n1 is larger\n":"\nn2 is larger\n");

        return 0;
}

//……..2.cpp……
#include <iostream>

using namespace std;
int main ()
{
        int n1,n2;
        cout<<"\nEnter two integers";
```

```
	cin>>n1>>n2;
	if(n1>n2)
		cout<<"n1 is larger\n";
	else
		cout<<"\nn2 is larger\n";

	return 0;
}
///……3.cpp……///
//Nesting of if else ........//

#include <iostream>

using namespace std;

// function main begins program execution
int main()
{

	int n1,n2;
	cout<<"\nEnter two integers";
	cin>>n1>>n2;
	if(n1>n2)
	{
		cout<<"\nn1 is Larger";
		if (n1%2==0)
		{
			cout<<" and n1 is Even\n";
		}
		else
		{
			cout<<" and n1 is Odd\n";
		}
	}
	else
	{
		cout<<"\nn2 is Larger";
		if (n2%2==0)
		{
			cout<<" and n2 is Even\n";
		}
		else
		{
			cout<<" and n2 is Odd\n";
		}
	}

	return 0;
```

```
} // end function main

///……Challange……. covert 3.cpp using conditional ternary operator……////

/////……4.cpp……..///
#include <iostream>
using namespace std;
//function main begins program execution
int main()
{
	int number;
	cout<<"\nEnter an integer value : ";
	cin>>number;

	number%2==0? cout<<"\nValue is Even "<<number<<endl:cout<<"\nValue is Odd
"<<number<<endl;

} // end function main

/// . . . .  convert 4.cpp using if . .  .else statement ……..//

//……5.cpp……
// This program demonstrates the nested if statement.
 #include <iostream>
using namespace std;

int main()
{
	char employed, // Currently employed, Y or N
	recentGrad; // Recent graduate, Y or N

	// Is the user employed and a recent graduate?
	cout << "Answer the following questions\n";
	cout << "with either Y for Yes or ";
	cout << "N for No.\n";
	cout << "Are you employed? ";
	cin >> employed;
	cout << "Have you graduated from college ";
	cout << "in the past two years? ";
	cin >> recentGrad;
	 // Determine the user's loan qualifications.
	if (employed == 'Y'|| employed == 'y')
	{
		if (recentGrad == 'Y' || recentGrad == 'y') // Nested if
		{
			cout << "You qualify for the special ";
			cout << "interest rate.\n";
```

```
                }
                else // Not a recent grad, but employed
                {
                        cout << "You must have graduated from ";
                        cout << "college in the past two\n";
                        cout << "years to qualify.\n";
                }
        }
        else // Not employed
        {
        cout << "You are not employed so you are not qualifying.\n";
        }
return 0;
}
```

///……Challange……. covert 5.cpp using conditional ternary operator……..////

//……6.cpp ……..

//multi-selector using if….else…if

```
include <iostream>
using namespace std;

// This program uses nested if/else statements to assign a
// letter grade (A, B, C, D, or F) to a numeric test score.
#include <iostream>
using namespace std;

int main()
{

        int testScore; // To hold a numeric test score

        // Get the numeric test score.
        cout << "Enter your numeric test score and I will\n";
        cout << "tell you the letter grade you earned: ";
        cin >> testScore;

        // Determine the letter grade.
        if (testScore >= 80)
        {
                cout << "Your grade is A.\n";
        }
        else    if (testScore >=70 && testScore<80)
                {
                        cout << "Your grade is B.\n";
                }
```

```
        else if (testScore >=60 && testScore<70 )
                {
                        cout << "Your grade is C.\n";
                }
                else    if (testScore >= 50 && testScore<60)
                        {
                                cout << "Your grade is D.\n";
                        }
                        else if (testScore < 50)
                        {
                                cout << "Your grade is F.\n";
                        }

return 0; // indicate that program ended successfully
}
```

///…… covert 6.cpp using single selector……..////

// . . . . . challenge: Can we make it more optimize or efficient????.....if yes convert

//what below program will display

//……7.cpp ……..

```
#include <iostream>
using namespace std;
int main()
{
        const int UPPER = 8, LOWER = 2;
        int num1, num2, num3 = 12, num4 = 3;
        num1 = num3 < num4 ? UPPER : LOWER;
        num2 = num4 > UPPER ? num3 : LOWER;
        cout << num1 << " " << num2 << endl;
return 0;
}
```

/// . . . . convert 7.cpp using if statement ……..//

Rewrite the following if/else statements as conditional expressions:

A)

```
if (x > y)
        z = 1;
else
        z = 20;
```

B)

```
 if (temp > 45)
        population = base * 10;
```

```
        else
                population = base * 2;
```

C)

```
                if (hours > 40)
                        wages *= 1.5;
                else
                        wages *= 1;
```

D)

```
                if (result >= 0)
                        cout << "The result is positive\n";
                else
                        cout << "The result is negative.\n";
```

The following statements use conditional expressions. Rewrite each with an if-else statement.

A) `j = k > 90 ? 57 : 12;`

B) `factor = x >= 10 ? y * 22 : y * 35;`

C) `total += count == 1 ? sales : count * sales;`

D) `cout << (((num % 2) == 0) ? "Even\n" : "Odd\n");`

//////////……PART-2 ……////////

Run following programs in separate .cpp files and carefully understand the output.

//……1.cpp……

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

```
	int x1,x2;

	cin>>x1>>x2;

	x1>x2?x1%2==0?cout<<"X1 is Greater and Even":cout<<"X1 is Greater and Odd":x2%2==0?cout<<"X2 is Greater and Even":cout<<"X2 is Greater and Odd";


return 0;

}
```

……..2.cpp…….

Execute following code and understand what happening. Convert the it with nested if else?

```
//Nesting of Conditional operator
#include <iostream>
using namespace std;
int main()
{

	int val;
	cout<<"Enter a value between 0 ----- 100  ";
	cin>>val;

	val<0 || val>100 ? cout<<"wrong Value" : val %2 == 0 ? cout<<"Even Val":cout<<"Odd Val";

return 0;
```

……..3.cpp…….

Execute following code and understand what happening. Convert the it with nested if else?

```
//Nesting of Conditional operator
#include <iostream>
using namespace std;


int main()
{
	char Gender, Dept;
	cout<<"Enter Gender M for Male OR F for Female: ";
	cin>>Gender;
	cout<<"Enter C for CS Department OR E EE Department: ";
	cin>>Dept;

cout<<( Dept == 'C' || Dept == 'c' ? Gender == 'm' || Gender == 'M'? "\nMale CS Faculty Member" :
"\nFemale CS Faculty Member"  :    Gender == 'm' || Gender == 'M' ? "\nMale EE Faculty Member" :
```

```
"\nFemale EE Faculty Member" );

 return 0;
}
```

……4.cpp……

Execute the following code and convert it with switch statement.

```
// Menu Program using if-else
#include <iostream>
using namespace std;
int main()
{
            int day;
            cout<<"\n Enter Any of following code for day"
            <<"\n 1 for Sunday"
            <<"\n 2 for Monday"
            <<"\n 3 for Tuesday"
            <<"\n 4 for Wednesday"
            <<"\n 5 for Thursday"
            <<"\n 6 for Friday"
            <<"\n 7 for Saturday"
            <<"\n Any other code is considered as illigal"<<endl;
            cin>>day;
            if (day == 1)
                        cout << "Sunday\n";
            else if (day == 2)
                        cout << "Monday\n";
            else if (day == 3)
                        cout << "Tuesday\n";
           else if (day == 4)
                        cout << "Wednesday\n";
            else if (day == 5)
                        cout << "Thursday\n";
            else if (day == 6)
                        cout << "Friday\n";
            else if (day == 7)
                        cout << "Saturday\n";
            else
                         cout << "Not a legal day\n";
            return 0;
}
```

……5.cpp……

Execute the following code and find out what is problem with the code and correct it accordingly.

Convert the following code with if…else …if.

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

	char grade;
	cout<<"Input your letter Grade";
	cin>>grade;
	switch(grade)
	{
		case 'a':
		case 'A':
			cout<<"More than 80%"<<endl;
			cout<<grade<<endl;

		case 'b':
		case 'B':
			cout<<"Between 70% and 80%"<<endl;
			cout<<grade<<endl;

		case 'c':
		case 'C':
			cout<<"Between 60% and 70%"<<endl;
			cout<<grade<<endl;

		case 'd':
		case 'D':
		cout<<"Between 50% and 60%"<<endl;
			cout<<grade<<endl;

		default:
		cout<<"Under 50% you are failed"<<endl;
			cout<<grade<<endl;

	}
return 0;
}
```

……
……..Answer the following questions using compiler……..
……

1) Convert the following multi-selector code using **switch** *statement. Note your code should be optimized i.e.* ***<u>each case includes only one cout statement</u>***.

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

    int ch;
    cout<<"Enter Semester No. 1 to 4 ";
    cin>>ch;
    if (ch ==1)
    {
      cout<<"You can study semester 1 courses\n";
    }
    else if (ch==2)
    {
      cout<<"You can study semester 1 courses\n";
      cout<<"You can study semester 2 courses\n";
    }

    else if (ch ==3)
    {
      cout<<"You can study semester 1 courses\n";
      cout<<"You can study semester 2 courses\n";
      cout<<"You can study semester 3 courses\n";
    }
    else if (ch ==4)
    {
      cout<<"You can study semester 1 courses\n";
      cout<<"You can study semester 2 courses\n";
      cout<<"You can study semester 3 courses\n";
      cout<<"You can study semester 4 courses\n";
    }
    else cout<<"Invalid Input";
    return 0;
    }
```

2. Explain why you cannot convert the following if/else if statements into a switch statements.

……..code Segment 1 ……..

```
if (temp == 100)
x = 0;
else if (population > 1000)
x = 1;
else if (rate < .1)
x = -1;
```

……..code Segment 2 ……..

```
int x, y;
std::cin >> x >> y;
if (x < 10)
y = 10;
else if (x == 5)
y = 5;
else if (x == y)
y = 0;
else if (y > 10)
x = 10;
else
x = y;
```

3. What is wrong with the following switch statement?

```
switch (temp)
{
case temp < 0 : cout << "Temp is negative.\n";
break;
case temp == 0: cout << "Temp is zero.\n";
break;
case temp > 0 : cout << "Temp is positive.\n";
break;
}
```

4. Compile the following code segment and explain what are the problems/errors and remove all problems/errors if possible?

```
double testScore;
cout << "Enter your test score and I will tell you\n";
cout << "the letter grade you earned: ";
cin >> testScore;
```

```
switch (testScore)
{
case (testScore < 60.0):
cout << "Your grade is F.\n";
break;
case (testScore < 70.0):
cout << "Your grade is D.\n";
break;
case (testScore < 80.0):
cout << "Your grade is C.\n";
break;
case (testScore < 90.0):
cout << "Your grade is B.\n";
break;
case (testScore <= 100.0):
cout << "Your grade is A.\n";
break;
default:
cout << "That score isn't valid\n";
```

5. What will the following program display?

```
int funny = 7, serious = 15;
funny = serious * 2;
switch (funny)
{
case 0 : cout << "That is funny.\n";
break;
case 30: cout << "That is serious.\n";
break;
case 32: cout << "That is seriously funny.\n";
break;
default: cout << funny << endl;
}
```

6. Consider the following code Segment.

```
int x;
std::cin >> x;
switch (x + 3) {
case 5:
std::cout << x << '\n';
break;
case 10:
std::cout << x - 3 << '\n';
break;
case 20:
std::cout << x + 3 << '\n';
break;
}
```

(a)What is printed when the user enters 2?
(b) What is printed when the user enters 5?
(c) What is printed when the user enters 7?
(d) What is printed when the user enters 17?
(e) What is printed when the user enters 20?

7. Consider the following code Segment.

```
char ch;
std::cin >> ch;
switch (ch) {
case 'a':
std::cout << "*\n";
break;
case 'A':
std::cout << "**\n";
break;
case 'B':
case 'b':
std::cout << "***\n";
case 'C':
case 'c':
std::cout << "****\n";
break;
default:
std::cout << "*****\n";
}
```

(a) What is printed when the user enters a?
(b) What is printed when the user enters A?
(c) What is printed when the user enters b?
(d) What is printed when the user enters B?
(e) What is printed when the user enters C?
(f) What is printed when the user enters c?
(g) What is printed when the user enters t?

8. Rewrite the following segments using switch statement instead of the if/else if statement.

……code Segment 1 ……..

```
int value;
char ch;
std::cin >> ch;
if (ch == 'A')
value = 10;
else if (ch == 'P')
```

```
value = 20;
else if (ch == 'T')
value = 30;
else if (ch == 'V')
value = 40;
else
value = 50;
std::cout << value << '\n';
```

……code Segment 2 ……..

```
int selection;
cout << "Which formula do you want to see?\n\n";
cout << "1. Area of a circle\n";
cout << "2. Area of a rectangle\n";
cout << "3. Area of a cylinder\n"
cout << "4. None of them!\n";
cin >> selection;
if (selection == 1)
cout << "Pi times radius squared\n";
else if (selection == 2)
cout << "Length times width\n";
else if (selection == 3)
cout << "Pi times radius squared times height\n";
else if (selection == 4)
cout << "Well okay then, good bye!\n";
else
cout << "Not good with numbers, eh?\n";
```

……code Segment 3 ……..

```
if (choice == 1)
{
cout << fixed << showpoint << setprecision(2);
}
else if (choice == 2 || choice == 3)
{
cout << fixed << showpoint << setprecision(4);
}
else if (choice == 4)
{
cout << fixed << showpoint << setprecision(6);
}
else
{
cout << fixed << showpoint << setprecision(8);
}
```

9. Rewrite the following code fragment so that a multi-way if/else is used instead of the switch statement.

```
int value;
char ch;
std::cin >> ch;
switch (ch) {
case 'A':
std::cout << ch << '\n';
value = 10;
break;
case 'P':
case 'E':
std::cin >> value;
break;
case 'T':
std::cin >> ch;
value = ch;
case 'C':
value = ch;
std::cout << "value=" << value << ", ch=" << ch << '\n';
break;
case 'V':
value = ch + 1000;
break;
}
std::cout << value << '\n';
```

10.Consider the following code segment.

```
int choice; // To hold a menu choice
int months; // To hold the number of months
double charges; // To hold the monthly charges

 // Constants for membership rates
 const double ADULT = 40.0,
 CHILD = 20.0,
 SENIOR = 30.0;

 // Constants for menu choices
 const int ADULT_CHOICE = 1,
 CHILD_CHOICE = 2,
 SENIOR_CHOICE = 3,
 QUIT_CHOICE = 4;

 // Display the menu and get a choice.
 cout << "\t\tHealth Club Membership Menu\n\n"
 << "1. Standard Adult Membership\n"
 << "2. Child Membership\n"
<< "3. Senior Citizen Membership\n"
 << "4. Quit the Program\n\n"
 << "Enter your choice: ";
 cin >> choice;
```

```
// Set the numeric output formatting.
cout << fixed << showpoint << setprecision(2);

// Respond to the user's menu selection.
switch (choice)
{
case ADULT_CHOICE:
cout << "For how many months? ";
cin >> months;
charges = months * ADULT;
cout << "The total charges are $" << charges << endl;
break;

case CHILD_CHOICE:
cout << "For how many months? ";
cin >> months;
charges = months * CHILD;
cout << "The total charges are $" << charges << endl;
break;

case SENIOR_CHOICE:
cout << "For how many months? ";
cin >> months;
charges = months * SENIOR;
cout << "The total charges are $" << charges << endl;
break;

case QUIT_CHOICE:
cout << "Program ending.\n";
break;

default:
cout << "The valid choices are 1 through 4. Run the\n"
<< "program again and select one of those.\n";
}
```

a) What is purpose of this code?
b) Run this code for different inputs?
c) Convert the using Nested if-else statement?

11. Consider the following code segment.

```
if (value % 2 == 0)
value = 0;
else
value = value + 1;
```

a) What is purpose of this code?
b) Run this code for different inputs of value?

c) Convert the using ternary operator?

//////////……PART-3 ……/////////

Run following programs in separate .cpp files and carefully understand the output.

// what is the problem with 1.cpp and how to correct

//……1.cpp……

```
#include<iostream>
#include<string>
using namespace std;
int main()
{
        string alpha;
        cout<<”\nInput a long sentence”;
        cin>>alpha;
        cout<<endl;
        cout<<alpha;
        cout<<endl;
return 0;
}
```

// what is the problem with 2.cpp and how to correct

//……2.cpp……

```
#include<iostream>
using namespace std;
int main()
{
        char ch;
        int a;
        cout<<"\nEnter an integer Value : ";
        cin>>a;
        cout<<"\nEnter an character Value : ";
```

```
        ch=cin.get();
        cout<<"integer is :"<<a;
        cout<<"\ncharacter is : "<<ch;
return 0;
}
```

Run following program 3.cpp and carefully understand the output by entering Input A, B and C in separate Runs. Modify it to work for small a, b, c.

```
//…… 3.cpp……
#include<iostream>
#include<string>
using namespace std;
int main ()
{
        char choice;
        cout << "Enter A, B, or C: ";
        cin>>choice;
        switch (choice)
        {
        case 'A':
                cout << "You entered A.\n";

        case 'B':
                cout << "You entered B.\n";

        case 'C':
                cout << "You entered C.\n";

        default:
                cout << "You did not enter A, B, or C!\n";
        }
cout<<"\nOutside of Switch Statement\n";
```

```
return 0;


}
```

//Run following program 4.cpp and carefully understand the output. Modify the code using switch statement.

```
////……4.cpp……

#include <iostream>

using namespace std;

int main()

{

	int selection;

	cout << "Which formula do you want to see?\n\n";

	cout << "1. Area of a circle\n";

	cout << "2. Area of a rectangle\n";

	cout << "3. Area of a cylinder\n";

	cout << "4. None of them!\n";

	cin >> selection;

	if (selection == 1)

		cout << "Pi times radius squared\n";

	else if (selection == 2)

			cout << "Length times width\n";

		else if (selection == 3)

				cout << "Pi times radius squared times height\n";

			else if (selection == 4)

					cout << "Well okay then, good bye!\n";

				else

					cout << "Not good with numbers, eh?\n";

return 0;

}
```