



Writing **C++** Program
using **Conditional**
Statements to solve
real world problems



Working Example

We have an **integer** (the number of points). Bonus score are charged on it, according to the rules described below. Write a program that **calculates bonus score** for the number entered and **total points with bonuses**.

- If the number is **up to 100** including, bonus score is 5.
- If the number is **larger than 100**, bonus score is 20% of the number.
- If the number is **larger than 1000**, bonus score is 10% of the number.
- Additional bonus score (accrued separately from the previous ones):
 - for **even number** give + 1 point.
 - for number, that **ends with 5** give + 2 points.

Working Example: Test Cases

Input	Output
20	Bonus: 6 Updated Number: 26
175	Bonus: 37 Updated Number: 212
2703	Bonus: 270.3 Updated Number: 2973.3
15875	Bonus: 1589.5 Updated Number: 17464.5

Solution

Step 1:

Take integer input from the user

Let's make a variable **num** for taking the input.

```
1  #include <iostream>
2  using namespace std;
3  main()
4  {
5      int num;
6      cout << "Enter an integer Value: ";
7      cin >> num;
```

Solution

Step 2:

Include the condition:

- If the number is **up to 100 including**, make bonus score equal to 5

Let's make a variable **bonus** for calculating the bonus according to the condition.

```
1  #include <iostream>
2  using namespace std;
3  main()
4  {
5      int num;
6      cout << "Enter an integer Value: ";
7      cin >> num;
8      float bonus;
```

Food for Thought:
Can someone tell why we have declared bonus as float type?

Solution

Step 2:

Include the condition:

- If the number is **up to 100 including**, make bonus score equal to 5

Let's write the condition now.

```
1  #include <iostream>
2  using namespace std;
3  main()
4  {
5      int num;
6      cout << "Enter an integer Value: ";
7      cin >> num;
8      float bonus;
9      if (num <= 100){
10         bonus = 5;
11     }
```

Solution

Step 3:

Include the condition:

- If the number is **larger than 100**, bonus score is 20% of the number.

Bonus will be 20% of the number entered by the user

```
1  #include <iostream>
2  using namespace std;
3  main()
4  {
5      int num;
6      cout << "Enter an integer Value: ";
7      cin >> num;
8      float bonus;
9      if (num <= 100){
10         bonus = 5;
11     }
12     if (num > 100){
13         bonus = num * (20.0/100);
14     }
```

Food for Thought:
Can someone tell why we have wrote 20.0 ?

Solution

Step 4:

Include the condition:

- If the number is **larger than 1000**, bonus score is 10% of the number.

Bonus will be 10% of the number entered by the user

```
1  #include <iostream>
2  using namespace std;
3  main()
4  {
5      int num;
6      cout << "Enter an integer Value: ";
7      cin >> num;
8      float bonus;
9      if (num <= 100){
10         bonus = 5;
11     }
12     if (num > 100){
13         bonus = num * (20.0/100);
14     }
15     if (num > 1000){
16         bonus = num * (10.0/100);
17     }
```


Solution

Step 5:

Include the condition:

- for **even number** give + 1 point

+1 will be added in the bonus if the number is even.

```
1  #include <iostream>
2  using namespace std;
3  main()
4  {
5      int num;
6      cout << "Enter an integer Value: ";
7      cin >> num;
8      float bonus;
9      if (num <= 100){
10         bonus = 5;
11     }
12     if (num > 100){
13         bonus = num * (20.0/100);
14     }
15     if (num > 1000){
16         bonus = num * (10.0/100);
17     }
```

Food for Thought:

How to check if the number is Even ?

Solution

Step 5:

Include the condition:

- for **even number** give + 1 point

+1 will be added in the bonus if the number is even.

```
1  #include <iostream>
2  using namespace std;
3  main()
4  {
5      int num;
6      cout << "Enter an integer Value: ";
7      cin >> num;
8      float bonus;
9      if (num <= 100){
10         bonus = 5;
11     }
12     if (num > 100){
13         bonus = num * (20.0/100);
14     }
15     if (num > 1000){
16         bonus = num * (10.0/100);
17     }
18     if (num % 2 == 0){
19         bonus = bonus + 1;
20     }
```

Solution

Step 6:

Include the condition:

- for number, that **ends with 5** give + 2 points

+2 will be added in the bonus if the number ends with 5.

```
1  #include <iostream>
2  using namespace std;
3  main()
4  {
5      int num;
6      cout << "Enter an integer Value: ";
7      cin >> num;
8      float bonus;
9      if (num <= 100){
10         bonus = 5;
11     }
12     if (num > 100){
13         bonus = num * (20.0/100);
14     }
15     if (num > 1000){
16         bonus = num * (10.0/100);
17     }
18     if (num % 2 == 0){
19         bonus = bonus + 1;
20     }
21     if (num % 10 == 5){
22         bonus = bonus + 2;
23     }
```

Solution

Step 7:

Display the output on the console

```
1  #include <iostream>
2  using namespace std;
3  main()
4  {
5      int num;
6      cout << "Enter an integer Value: ";
7      cin >> num;
8      float bonus;
9      if (num <= 100){
10         bonus = 5;
11     }
12     if (num > 100){
13         bonus = num * (20.0/100);
14     }
15     if (num > 1000){
16         bonus = num * (10.0/100);
17     }
18     if (num % 2 == 0){
19         bonus = bonus + 1;
20     }
21     if (num % 10 == 5){
22         bonus = bonus + 2;
23     }
24     cout << "Bonus: " << bonus << endl;
25     cout << "Updated Number: " << num + bonus;
26 }
```

Learning Objective

In this lecture, we learnt how to write a **C++** program that takes **input** from the user, **apply conditions on it** and gives **output** on Console.



Self Assessment

Write a Program that takes a number and a character and gives the perimeter of either a **circle** or a **square**. The input will be in the form of **letter** and **number** where the letter will be either '**s**' for square, or '**c**' for circle, and the number will be the side of the square or the radius of the circle.

Use the following formulas:

Perimeter of a square: $4 * \text{side}$.

Perimeter of a circle: $6.28 * \text{radius}$.

