



#### Working Example

John is an entrepreneur and he opens small shops in a few cities with different prices in dollars for the following products:

Product	Chicago	Phoenix	Houston
Coffee	0.50	0.40	0.45
Sweets	1.45	1.30	1.35
Water	0.80	0.70	0.70

Calculate the price (float) by the given city (string), product (string) and quantity (integer).

## Working Example: Test Cases

Input	Output
Product: Coffee City: Houston Quantity: 2	Price: 0.9
Product: Water City: Phoenix Quantity: 3	Price: 2.1
Product: Sweets City: Chicago Quantity: 5	Price: 7.25

#### Solution

Lets see the solution step by step using nested If statements.



#### Step 1

First of all, take product, city and quantity as input from the user.

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```
#include <iostream>
using namespace std;
main(){
    string product, city;
    int quantity;
    float price;
    cout << "Product: ";
    cin >> product;
    cout << "City: ";
    cin >> city;
    cout << "Quantity: ";
    cin >> quantity;
```

#### #include <iostream> using namespace std; main(){ string product, city; int quantity; Apply float price; conditions of cout << "Product: ";</pre> cin >> product; different cout << "City: ";</pre> prices if the 10 cin >> city; product is 11 cout << "Quantity: ";</pre> 12 cin >> quantity; Coffee and 13 if (product == "Coffee"){ the city is if(city == "Chicago"){ 14 price = quantity \* 0.50; 15 Chicago, 16 Phoenix or if(city == "Phoenix"){ 17 price = quantity \* 0.40; 18 Houston. 19 if(city == "Houston"){ 20 21 price = quantity \* 0.45; 22 23

```
#include <iostream>
                                                               24
                                                                       if (product == "Sweets"){
                           using namespace std;
                                                               25
      Step
                                                               26
                           main(){
                                                               27
                               string product, city;
                                                               28
                               int quantity;
Apply
                                                               29
                               float price;
conditions of
                                                               30
                               cout << "Product: ";
                                                               31
                               cin >> product;
different
                                                               32
                               cout << "City: ";</pre>
prices if the
                                                               33
                      10
                               cin >> city;
                                                               34
                               cout << "Quantity: ";
product is
                      11
                      12
                               cin >> quantity;
Sweets and
                      13
                               if (product == "Coffee"){
the city is
                                   if(city == "Chicago"){
                      14
                      15
                                      price = quantity * 0.50;
Chicago,
                      16
Phoenix or
                                   if(city == "Phoenix"){
                      17
                      18
                                      price = quantity * 0.40;
Houston.
                      19
                                   if(city == "Houston"){
                      20
                      21
                                      price = quantity * 0.45;
                      22
                      23
```

price = quantity \* 1.30; if(city == "Houston"){ price = quantity \* 1.35;

price = quantity \* 1.45;

if(city == "Chicago"){

if(city == "Phoenix"){

```
#include <iostream>
                                                                  24
                                                                           if (product == "Sweets"){
                            using namespace std;
                                                                  25
                                                                               if(city == "Chicago"){
      Step
                                                                                  price = quantity * 1.45;
                                                                  26
                            main(){
                                                                  27
                                string product, city;
                                                                               if(city == "Phoenix"){
                                                                  28
                                int quantity;
Apply
                                                                  29
                                                                                  price = quantity * 1.30;
                                float price;
conditions of
                                                                  30
                                cout << "Product: ";
                                                                  31
                                                                               if(city == "Houston"){
                                cin >> product;
different
                                                                                  price = quantity * 1.35;
                                                                  32
                                cout << "City: ";</pre>
prices if the
                                                                  33
                       10
                                cin >> city;
                                                                  34
                                cout << "Quantity: ";
product is
                       11
                                                                           if (product == "Water"){
                                                                  35
                       12
                                cin >> quantity;
                                                                  36
                                                                               if(city == "Chicago"){
Water and
                       13
                                if (product == "Coffee"){
                                                                                  price = quantity * 0.80;
                                                                  37
the city is
                                    if(city == "Chicago"){
                       14
                                                                  38
                       15
                                        price = quantity * 0.50;
Chicago,
                                                                  39
                                                                               if(city == "Phoenix"){
                       16
                                                                  40
                                                                                  price = quantity * 0.70;
Phoenix or
                                    if(city == "Phoenix"){
                       17
                                                                  41
                       18
                                        price = quantity * 0.40;
                                                                               if(city == "Houston"){
                                                                  42
Houston.
                       19
                                                                  43
                                                                                  price = quantity * 0.70;
                                    if(city == "Houston"){
                       20
                                                                  44
                       21
                                        price = quantity * 0.45;
                                                                  45
                       22
                       23
```

```
if (product == "Sweets"){
                              using namespace std;
                                                                     25
                                                                                  if(city == "Chicago"){
      Step 5
                                                                                      price = quantity * 1.45;
                                                                     26
                             main(){
                                                                     27
                                  string product, city;
                                                                                  if(city == "Phoenix"){
                                                                     28
                                  int quantity;
Display the
                                                                     29
                                                                                      price = quantity * 1.30;
                                 float price;
calculated
                                                                     30
                                  cout << "Product: ";
                                                                     31
                                                                                  if(city == "Houston"){
                                  cin >> product;
price on the
                                                                                      price = quantity * 1.35;
                                                                     32
                                  cout << "City: ";</pre>
Console.
                                                                     33
                        10
                                  cin >> city;
                                                                     34
                                  cout << "Quantity: ";</pre>
                        11
                                                                     35
                                                                              if (product == "Water"){
                        12
                                  cin >> quantity;
                                                                     36
                                                                                  if(city == "Chicago"){
                        13
                                  if (product == "Coffee"){
                                                                     37
                                                                                      price = quantity * 0.80;
                                      if(city == "Chicago"){
                        14
                                                                     38
                        15
                                          price = quantity * 0.50;
                                                                     39
                                                                                  if(city == "Phoenix"){
                        16
                                                                     40
                                                                                      price = quantity * 0.70;
                        17
                                      if(city == "Phoenix"){
                                                                     41
                        18
                                          price = quantity * 0.40;
                                                                     42
                                                                                   if(city == "Houston"){
                        19
                                                                     43
                                                                                      price = quantity * 0.70;
                                      if(city == "Houston"){
                        20
                                                                     44
                        21
                                          price = quantity * 0.45;
                                                                     45
                        22
                                                                              cout << "Price: " << price;</pre>
                                                                     46
                        23
                                                                     47
```

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#include <iostream>

#### Output on the Console

C:\C++>example.exe

Product: Water

City: Phoenix

Quantity: 3

Price: 2.1

C:\C++>example.exe

**Product: Sweets** 

City: Chicago

Quantity: 5

Price: 7.25

C:\C++>example.exe

Product: Coffee

City: Houston

Quantity: 2

Price: 0.9

#### Solution

This solution was with Nested Ifs. Lets see how we can use logical operators to add more than 1 condition in a single IF statement.



#### Step 1

First of all, take product, city and quantity as input from the user.

```
#include <iostream>
using namespace std;
main(){
    string product, city;
    int quantity;
    float price;
    cout << "Product: ";
    cin >> product;
    cout << "City: ";
    cin >> city;
    cout << "Quantity: ";
    cin >> quantity;
```

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#### Step 2

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13 14

15 16

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18 19

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Apply conditions of different prices if the product is Coffee and the city is Chicago, Phoenix or Houston using AND logical operator.

```
#include <iostream>
using namespace std;
main(){
    string product, city;
    int quantity;
    float price;
    cout << "Product: ";
    cin >> product;
    cout << "City: ";
    cin >> city;
    cout << "Quantity: ";
    cin >> quantity;
    if (product == "Coffee" && city == "Chicago"){
        price = quantity * 0.50;
    if(product == "Coffee" && city == "Phoenix"){
        price = quantity * 0.40;
    if(product == "Coffee" && city == "Houston"){
        price = quantity * 0.45;
```

#### #include <iostream> using namespace std; Step main(){ string product, city; int quantity; float price; Apply cout << "Product: "; cin >> product; 8 conditions of cout << "City: "; 10 cin >> city; different 11 cout << "Quantity: "; 12 cin >> quantity; prices if the if (product == "Coffee" && city == "Chicago"){ 13 14 price = quantity \* 0.50; product is 15 16 if(product == "Coffee" && city == "Phoenix"){ Sweets and 17 price = quantity \* 0.40; 18 the city is 19 if(product == "Coffee" && city == "Houston"){ Chicago, 20 price = quantity \* 0.45; 21 Phoenix or 22 if (product == "Sweets" && city == "Chicago"){ 23 price = quantity \* 1.45; Houston using 24 25 if(product == "Sweets" && city == "Phoenix"){ AND logical 26 price = quantity \* 1.30; 27 operator. 28 if(product == "Sweets" && city == "Houston"){

price = quantity \* 1.35;

29

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```
#include <iostream>
                                  using namespace std;
                                  main(){
                                                                           if (product == "Water" && city == "Chicago"){
                                      string product, city;
                                                                    32
                                                                              price = quantity * 0.80;
                                      int quantity;
                                      float price;
                                                                           if(product == "Water" && (city == "Phoenix" || city == "Houston")){
                                                                    34 V
Apply
                                      cout << "Product: ";
                                                                              price = quantity * 0.70;
                                      cin >> product;
                              8
                                                                    36
conditions of
                                      cout << "City: ";
                             10
                                      cin >> city;
different
                             11
                                      cout << "Quantity: ";
                             12
                                      cin >> quantity;
prices if the
                             13
                                      if (product == "Coffee" && city == "Chicago"){
                                         price = quantity * 0.50;
                             14
product is
                             15
                             16
                                      if(product == "Coffee" && city == "Phoenix"){
Water and
                             17
                                         price = quantity * 0.40;
                             18
the city is
                             19
                                      if(product == "Coffee" && city == "Houston"){
Chicago,
                                         price = quantity * 0.45;
                             20
                             21
Phoenix or
                             22
                                      if (product == "Sweets" && city == "Chicago"){
                             23
                                         price = quantity * 1.45;
Houston using
                             24
                             25
                                      if(product == "Sweets" && city == "Phoenix"){
AND and OR
                             26
                                         price = quantity * 1.30;
                             27
logical
                             28
                                      if(product == "Sweets" && city == "Houston"){
                             29
                                         price = quantity * 1.35;
operator.
                             30
```

# Step 5 Display the

#### calculated price on the Console.

```
using namespace std;
     main(){
                                                     if (product == "Water" && city == "Chicago"){
                                             31 V
          string product, city;
                                             32
          int quantity;
                                             33
          float price;
                                                     if(product == "Water" && (city == "Phoenix" || city == "Houston")){
                                             34 V
          cout << "Product: ";
                                             35
          cin >> product;
                                             36
 9
          cout << "City: ";
                                             37
                                                     cout << "Price: " << price;</pre>
                                             38
10
          cin >> city;
11
          cout << "Quantity: ";
12
          cin >> quantity;
          if (product == "Coffee" && city == "Chicago"){
13
14
              price = quantity * 0.50;
15
16
          if(product == "Coffee" && city == "Phoenix"){
17
              price = quantity * 0.40;
18
19
          if(product == "Coffee" && city == "Houston"){
20
              price = quantity * 0.45;
21
22
          if (product == "Sweets" && city == "Chicago"){
23
              price = quantity * 1.45;
24
25
          if(product == "Sweets" && city == "Phoenix"){
              price = quantity * 1.30;
26
27
28
          if(product == "Sweets" && city == "Houston"){
29
              price = quantity * 1.35;
30
```

price = quantity \* 0.80;

price = quantity \* 0.70;

#include <iostream>

## Learning Objective

In this lecture, we learnt how to write a C++ program that takes input from the user, apply nested conditions or conditions using logical operators based on the input and gives output on Console.



#### Self Assessment

Depending on age (decimal number and gender (m / f), print a personal title:

```
"Mr." - a man (gender "m") - 16 or more years old.

"Mister" - a boy (gender "m") under 16 years.

"Ms." - a woman (gender "f") - 16 or more years old.

"Miss" - a girl (gender "f") under 16 years.
```



## Self Assessment

#### Test Cases:

Input	Output
12 f	Miss
13.5 m	Mister
17 m	Mr.
25 f	Ms.

