

Students:
Section 5.5 is a part of 2 assignments: CSC108 CH05.1-5.7 C5A ▾
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Includes: CA
Due: 04/03/2025, 11:59 PM EDT

5.5 Functions with branches

Example: Shipping cost calculator

A function's statements may include branches and other statements. The following example uses a function to calculate a package's shipping cost based on weight.

Figure 5.5.1: Shipping cost calculator.

```
#include <iostream>
#include <iomanip>

using namespace std;

double CalcTax(double cost) {
    return cost * 0.15;
}

// Determine shipping cost based on weight
double CalcShippingCost(double weight) {
    double cost;

    if (weight < 1) {
        cost = 7.88;
    }
    else if (weight < 6) {
        cost = 14.32;
    }
    else if (weight < 10) {
        cost = 21.11;
    }
    else {
        cost = 25.5;
    }
    cost = cost + CalcTax(cost);
    return cost;
}

int main() {
    double weightOfPackage; // User defined package weight

    cout << "Enter package weight: ";
    cin >> weightOfPackage;
    cout << "Shipping cost: $";
    cout << fixed << setprecision(2) << CalcShippingCost(weightOfPackage) << endl;
    return 0;
}
```

```
Enter package weight: 6
Shipping cost: $24.28
...
Enter package weight: 10.5
Shipping cost: $29.33
...
Enter package weight: 3.0
Shipping cost: $16.47
```

Feedback?

PARTICIPATION ACTIVITY | 5.5.1: Analyzing the shipping cost calculator.

- 1) For a package weight of 7.5 lbs, what is the cost returned by CalcShippingCost? Type as #.##

Check Show answer

- 2) When main() is executed, which user defined function is called first?

Check Show answer

Feedback?

Example: Auction website fee calculator

The following example uses a function to compute the fee charged by eBay when a customer sells an item online.

Figure 5.5.2: Function example: Determining fees given an item selling price for an auction website.

```
#include <iostream>
using namespace std;

/* Returns Fee charged by ebay.com given the selling
   price of fixed-price books, movies, music, or video-games.
   Fee is $0.50 to list plus a % of the selling price:
   13% for $50.00 or less
   plus 5% for $50.01 to $1000.00
   plus 2% for $1000.01 or more
   Source: http://pages.ebay.com/help/sell/fees.html, 2012.

   Note: double variables often are not used for dollars/cents,
   but here the dollar fraction may extend past two decimal places.
*/

// Function determines ebay price given item selling price
double CalcBayFee(double sellPrice) {
    const double BASE_LIST_FEE = 0.50; // Listing Fee
    const double PERC_50_OR_LESS = 0.13; // $50 or less
    const double PERC_50_TO_1000 = 0.05; // $50.01-$1000.00
    const double PERC_1000_OR_MORE = 0.02; // $1000.01 or more
    double feeTotal;

    feeTotal = BASE_LIST_FEE;

    // Determine additional fee based on selling price
    if (sellPrice <= 50.00) { // $50.00 or lower
        feeTotal += (sellPrice * PERC_50_OR_LESS);
    }
    else if (sellPrice <= 1000.00) { // $50.01-$1000.00
        feeTotal += (50 * PERC_50_TO_1000)
            + ((sellPrice - 50) * PERC_1000_OR_MORE);
    }
    else { // $1000.01 and higher
        feeTotal = feeTotal + (50 * PERC_50_OR_LESS)
            + ((1000 - 50) * PERC_50_TO_1000)
            + ((sellPrice - 1000) * PERC_1000_OR_MORE);
    }

    return feeTotal;
}

int main() {
    double sellingPrice; // User defined selling price

    cout << "Enter item selling price (Ex: 65.00): ";
    cin >> sellingPrice;

    cout << "eBay fee: $" << CalcBayFee(sellingPrice) << endl;
    return 0;
}
```

```
Enter item selling price (Ex: 65.00): 9.95
eBay fee: $1.7935
...
Enter item selling price (Ex: 65.00): 40
eBay fee: $5.7
...
Enter item selling price (Ex: 65.00): 100
eBay fee: $9.5
...
Enter item selling price (Ex: 65.00): 500.15
eBay fee: $29.5075
...
Enter item selling price (Ex: 65.00): 2000
eBay fee: $74.5
```

Feedback?

PARTICIPATION ACTIVITY | 5.5.2: Analyzing the eBay fee calculator.

- 1) For any call to CalcBayFee(), how many assignment statements for the variable feeTotal will execute?

Check Show answer

- 2) What does CalcBayFee() return if the sellPrice argument is 0.0 (show your answer in the form #.##)?

Check Show answer

- 3) What does CalcBayFee() return if the sellPrice argument is 100.00 (show your answer in the form #.##)?

Check Show answer

Feedback?

CHALLENGE ACTIVITY | 5.5.1: Output of functions with branches.

620890_5010016.qc3zy7 Start

Type the program's output

```
#include <iostream>
using namespace std;

int NormalizeGrade(int grade) {
    int upperBound = 73;
    int lowerBound = 46;

    if (grade > upperBound) {
        return upperBound;
    }
    else if (grade <= lowerBound) {
        return lowerBound;
    }
    else {
        return grade;
    }
}

int main() {
    int grade1 = NormalizeGrade(25);
    int grade2 = NormalizeGrade(69);
    int grade3 = NormalizeGrade(85);

    cout << grade1 << endl;
    cout << grade2 << endl;
    cout << grade3 << endl;

    return 0;
}
```

46

69

73

1 Check Next

2

Feedback?

CHALLENGE ACTIVITY | 5.5.2: Function with branch: Popcorn.

620890_5010016.qc3zy7

Start

Full screen

Organize the lines of code to define a function PrintPopcornTime() with integer parameter bagOunces and void return type. If bagOunces is less than 2, print "Too small". If greater than 10, print "Too large". Otherwise, compute and print 6 * bagOunces followed by " seconds".

Ex: If the input is 7, then the output is:

42 seconds

How to use this tool ▾

Unused

```
else if (bagOunces > 10) {
```

```
if (bagOunces < 2) {
```

```
cout << "Too small" << endl;
```

```
else {
```

```
cout << (6 * bagOunces) << " seconds" << endl;
```

```
cout << "Too large" << endl;
```

main.cpp

Load default template...

```
#include <iostream>
using namespace std;
```

```
void PrintPopcornTime(int bagOunces) {
```

```
int main() {
```

```
int userOunces;
```

```
cin >> userOunces;
```

```
PrintPopcornTime(userOunces);
```

```
return 0;
```

Check

Next

Feedback?

CHALLENGE ACTIVITY | 5.5.3: Functions with branches.

620890_5010016.qc3zy7

Start

Define a function FindWinningPrize() that takes one integer parameter as the lottery number, and returns the prize as an integer. The prize is returned as follows:

- If the lottery number is 146 or 313, then the prize is \$1000.
- If the lottery number is 628 or 998, then the prize is \$5500.
- Otherwise, the prize is \$0.

Ex: If the input is 146, then the output is:

1000

```
1 #include <iostream>
2 using namespace std;
3
4 /* Your code goes here */
5
6 int main() {
7     int number;
8     cin >> number;
9
10    cout << FindWinningPrize(number) << endl;
11
12    return 0;
13}
```

1

2

1 Check

Next level

Feedback?

How was this section?

Provide section feedback

Activity summary for assignment: CSC108 CH05.1-5.7 C5A ▾

Due: 04/03/2025, 11:59 PM EDT

0 / 37 points

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Completion details ▾

↓ 5.6 Functions with loops