5.1 User-defined function basics

Students:
Section 5.2 is a part of 2 assignments: CSC108 CH05.1-5.7 CSA
Includes: CA
Due: 04/03/2025, 11:59 PM EDT
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5.2 Print functions

Printing from a function

A common operation for a function is to print text. Large text outputs can clutter the main() function of a program, especially if the text needs to be output multiple times. A function that only prints typically does not return a value. The **void** keyword indicates a function does not return a value. A function with a void return type is often called a ***void function***. Once a void function finishes execution, control returns back to the caller and no value is returned.

PARTICIPATION ACTIVITY 5.2.1: Printing with a void function.

Start 2x speed

```
void PrintSummary(int id, int items, double price){
  cout << "Order " << id << ":" << endl;
  cout << "  Items: " << items << endl;
  cout << fixed << setprecision(2)
  cout << "  Total: $" << price << endl;

int main() {
  int id = 42;
  int items = 4;
  double price = 13.99;
  PrintSummary(id, items, price);

  // Continues execution
}
```

```
Order 42:
  Items: 4
  Total: $ 13.99
```

Captions

Feedback?

PARTICIPATION ACTIVITY 5.2.2: Print functions.

1) Print operations must be performed in main().
- True
- False

2) A void function can have any number of parameters.
- True
- False

3) A print function must return the value that was output.
- True
- False

4) A void function can be defined with either "void" or no type specifier.
- True
- False

Feedback?

A function that produces output can also return a value, but this material separates these operations for clarity. A function that both outputs and returns a value must have a return type that is not void.

Calling a print function multiple times

One benefit of a print function is that complex output statements can be written in code once. Then the print function can be called multiple times to produce the output instead of rewriting complex statements for every necessary instance. Changes to output and formatting are made easier and are less prone to error.

PARTICIPATION ACTIVITY 5.2.3: Calling a print function repeatedly.

Start 2x speed

```
int main() {
  // Read from input: word = "Show"
  cout << "The Greatest **";
  cout << word;
  cout << "* on Earth:-*" << endl;

  // Read from input: word = "Shong"
  cout << "The Greatest **";
  cout << word;
  cout << "* on Earth:-*" << endl;
```

Program A

```
void PrintGreatest(string word){
  cout << "The Greatest **";
  cout << word;
  cout << "* on Earth:-*" << endl;

int main() {
  // Read from input: word = "Show"
  PrintGreatest(word);

  // Read from input: word = "Shong"
  PrintGreatest(word);
```

Program B

Captions

Feedback?

PARTICIPATION ACTIVITY 5.2.4: Calling a print function multiple times.

Refer to the example programs above.

1) To output the phrase, "The Greatest [word] on Earth", with ten different words, what is the minimum number of times main() would need to call PrintGreatest() in Program B?
- 1
- 10
- 30

2) To output "in the Galaxy" instead of "on Earth" in the phrase (Ex: "–The Greatest *Cafe* in the Galaxy!– "), how many statements need to be changed in Program A and Program B?
- Program A: 1
  Program B: 1
- Program A: 2
  Program B: 1
- Program A: 2
  Program B: 2

Feedback?

Example: Menu system

Figure 5.2.1: Example: Menu System.

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

void PrintMenu() {
  cout << "Today's Menu:" << endl;
  cout << "  1) Gumbo" << endl;
  cout << "  2) Jambalaya" << endl;
  cout << "  3) Quit" << endl << endl;
}

int main() {
  bool Quit = false;
  int choice;

  while (!quit) {
    PrintMenu();
    cout << "Enter choice: ";
    cin >> choice;
    if (choice == 3) {
      cout << "Goodbye" << endl;
      quit = true;
    }
    else {
      cout << "Cooper: ";
      if (choice == 1) {
        cout << "Gumbo" << endl;
      }
      else if (choice == 2) {
        cout << "Jambalaya" << endl;
      }
      cout << endl;
    }
  }

  return 0;
```

```
Today's Menu:
  1) Gumbo
  2) Jambalaya
  3) Quit

Enter choice: 2
Cooper: Jambalaya

Today's Menu:
  1) Gumbo
  2) Jambalaya
  3) Quit

Enter choice: 1
Cooper: Gumbo

Today's Menu:
  1) Gumbo
  2) Jambalaya
  3) Quit

Enter choice: 3
Goodbye
```

Feedback?

PARTICIPATION ACTIVITY 5.2.5: Example: Menu System.

Consider the example above.

1) How many times is PrintMenu() called?
- 1
- 2
- 3

2) Which of the following code statements if added to PrintMenu() would produce a compiler error?
- int numOptions;
- return 0;
- return;

Feedback?

Exploring further:

- Function definition from msdn.microsoft.com
- Function call from msdn.microsoft.com

CHALLENGE ACTIVITY 5.2.1: Function parameters.

zyBooks.zyDE.zyBoxp?

Start

Type the program's output

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

void Prompt(int userAge) {
  cout << "I am " << userAge << endl;
}

int main() {
  int ageToPrint;

  ageToPrint = 24;
  Prompt(ageToPrint);

  return 0;
}
```

```
I am 24
```

1 2 3 4 5

Check Next

Feedback?

CHALLENGE ACTIVITY 5.2.2: Function call with parameter: Printing formatted measurement.

Full screen

zyDEvo.zyDEvo.zyBoxp?

Organize the lines of code to define a function PrintFeetInchShort(), with int parameter numFeet and double parameter numInches, that prints using ' and " shorthand. The function should not return any value.

Ex: If the input is `5 8.0`, then the output is:

```
5' 8.0"
```

Hint: Use \" to print a double quote.

Note: Not all lines of code on the left will be used in the final solution.

How to use this tool

Unused

```
void PrintFeetInchShort(int numFeet, int numInches) {
void PrintFeetInchShort(int numFeet, double numInches) {
cout << fixed << setprecision(1) << numInches << "\" << endl;
cout << fixed << setprecision(1) << numInches << "" << endl;
}
return 0;
cout << numFeet << "' ";
```

main.cpp Load default template...

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

int main() {
  int userFeet;
  double userInches;

  cin >> userFeet;
  cin >> userInches;

  PrintFeetInchShort(userFeet, userInches);

  return 0;
}
```

Check

Feedback?

CHALLENGE ACTIVITY 5.2.3: Print functions.

zyDEvo.zyDEvo.zyBoxp?

Start

Define a function PrintData() that has one string parameter and one integer parameter and outputs as follows. End with a newline. PrintData() should not return any value.

Ex: If the input is `Philadelphia 1526006`, then the output is:

```
Philadelphia has 1526006 people.
```

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

/* Your code goes here */

int main() {
  string cityName;
  int cityData;

  cin >> cityName;
  cin >> cityData;

  PrintData(cityName, cityData);

  return 0;
}
```

1 2 3 4

Check Next level

Feedback?

How was this section? Provide section feedback

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Completion details

5.3 Reasons for defining functions