Ryan Baker

December 25, 2024

Contents

Lecture Objectives

1 Functions

- What is a function?
  - In programming, a function is a reusable block of code
  - It (optionally) takes input and (optionally) returns an output
- Why use functions?
  - We often want to repeat the same behavior on different pieces of data
  - Rather than pasting the same code many times, we use a function
    - Functions help to keep code maintainable and readable
  - There is a balance to strike when extracting code into functions
    - Too few functions results in long and repetitive code
    - Too many functions will result in sub-optimal performance and a code base that is very hard to read
      - Every time a function is called a new frame needs to be pushed to the stack and we jump around the executable
- How to define a function: **type name(arguments)**
  - **type**: The return type of the function (can be `void`)
  - **name**: The function's name
  - **arguments**: The input arguments to a function
    - Specified as **type name** in a comma seperated list
    - **Example**: `int add(int a, int b, int c) {...}`
  - Together, the function's name and arguments make up the signature
- How to call a function: `name(arguments)`
  - **Example**: `int sum = add(1, 2, 3); // sum = 6`