**Scope**

1. **Scope**
   1. refers to where within a program variable are defined and have a value
   2. *Scope can get messy and* confusing
2. **How variables are stored** 
   1. Whenever you create a variable (or constant) a chunk of memory is allocated to hold the value
   2. When you assign a value the variable, that value gets written to that memory location
   3. A variable is like a bookmark that points to the place in the memory that a value is written
3. Memory typically refers to RAM (volatile memory) and NOT long-term storage
4. A variable keeps track of the address in memory where the data is stored
5. **What is scope?** 
   1. Not all parts of a program are allowed to see (access) every variable
   2. Some variables can be hidden from parts of a program where they are not relevant
   3. The segment of a program in which a particular variable is visible is referred to as scope
6. **Purpose of scope** 
   1. To make it easier to write and maintain programs
   2. To allow programmers to reuse variable names, when appropriate make programs easier to understand
   3. For security purposes
7. **What are some different scopes?** 
   1. A variable that is visible to the entire program is called a global variable
   2. **A variables scope can be restricted to** 
      1. The program where it is defined
      2. The class where it is defined
      3. The function where it is defined
      4. The loop where it is defined
   3. A variables scope is considered local to the context in which it was defined
8. **Best practices** 
   1. Avoid global scope
   2. Try to keep scope as narrow as possible
   3. The mare variables you have, the more opportunities for bugs and the greater the surface area over which your software can be attacked
   4. Be consistent about where you declare variables
9. **Quirks** 
   1. Not all variables are treated equally
   2. Be careful with variables that point to the collections of things like arrays, lists, or objects
10. **Examples** 
    1. Print (x)
       1. Error because x is not defined