

CS 161 Weekly Objectives

Week One Objectives

- Describe the purpose of this class and general outcomes for the course.
- Describe the basic components of a simple computer and how they interact.
- Given a diagram of a basic computer, label the components.
- Describe how information is represented for computers.
- Discuss why binary code is used for computer data and instructions.
- Describe different types of programming languages and their relative advantages and disadvantages.
- Discuss the different ways of translating source programs (text files) into machine language.

Week Two Objectives

- Describe *literal* and *variable* data.
- Construct assignment, input and output statements.
- Describe different data types for storing numeric information and identify appropriate uses for them.
- Given a series of statements that modify the values of variables using arithmetic, type conversion, and **round**, state the value of the variables after the statements have been carried out.
- Evaluate arithmetic and string expressions.
- Construct expressions and statements to compute common arithmetic tasks.
- Demonstrate how use comments to identify a program and its author.

Week Three Objectives

- Formulate **for** structures to perform simple counter-controlled looping (iteration).
- Evaluate code that includes **for** structures.
- Show the lists of values returned by calls to the **range** function.
- Identify and correct syntax errors in code that includes **for** structures.

Week Four Objectives

- Identify when to use accumulators and counters.
- Construct and interpret code that manipulates string data.
- Construct **if** structures to solve simple problems.
- Interpret code that includes **if** structures.
- Identify and correct errors in **if** structures.

Week Five Objectives

- Interpret Python code that includes sentinel-controlled iteration.
- Recognize and correct errors in **while** structures.
- Recognize when to use sentinel controlled iteration.
- Construct **while** structures to implement sentinel-controlled iteration.
- Evaluate Boolean expressions that include **and**, **or**, & **not** operators.

Week Six Objectives

- Survive the midterm exam.
- Describe the process of top-down programming (aka *functional decomposition*)

Use functional decomposition to create outlines of the solution to simple problems.

Week Seven Objectives

Describe the concept of "Sub program" (function).

Given a function call, identify the parameters and state whether the function includes a return statement.

Given a description of its task, write the header for a function, identify which parameters it will have, and state whether it requires a return statement.

Write simple Python functions.

Recognize code that is a good candidate for encapsulation in a function.

Weeks Eight and Nine Objectives (Lists and Arrays)

Define "array" (*list*)

Recognize situations that call for the use of an array.

Declare arrays to represent information in various situations.

Show how to initialize a large array with default values.

Interpret code that includes array variables.

Explain how arrays are treated when passed as parameters.

Write code to manipulate data stored in arrays.