# CS 105

## Introduction to Scientific Computing

## Topic #17 – Structures

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# ASSIGNMENT 12

- Load data from file where each entry is in the format
  - Firstname, Lastname, Age
- Store this data in a single array
  - How?
  - Different data types ☹
- Select an entry at random and output his/her firstname, lastname and age

# NECESSARY SKILLS

- Reading from text files (last lecture)
- Extracting parts of strings (previous lecture)
- Forming *structures*

# TOPICS

1. Object Oriented Programming and Structures
2. Creating and Accessing Structures
3. Structure Arrays

# READING

- Section 7.2

# OBJECT ORIENTED PROGRAMMING

- Object Oriented Programming (OOP) is now central to most programming languages
  - We create "objects" out of data
    - Objects have several things associated with them
  - We can then do operations (functions) on the objects
- Example:  A Person Object
  - A person may have variables like
    - First name
    - Last name
    - Age
    - Height
  - And we might want to do stuff to a person like
    - Change age
    - Change height

# STRUCTURES

- The early incarnation of objects were *structures*
- Here we just have variables, or *fields* associated with an object
- In Matlab we create a structure with
  - P = struct(*fieldname1,value1, fieldname2, value2, …)*
- Then we can access variables of a structure with
  - *P.fieldname1*
  - *P.fieldname2*

# ARRAYS OF STRUCTURES

- Just like other data types we my want to have arrays of structures
- We can do this by
  - P(1) = struct(fieldname1, value1, …)
  - P(2) = struct(fieldname1, value1,…)
- And then access a particular structure just like with normal arrays
  - x = P(2);
  - disp(x.fieldname1)