# Quiz 4 Prep Questions

March 18, 2025

## 1 Using Struct

1. Write a struct definition for a `Student` with fields for name (character array of length 100), age (integer), and GPA (float).

2. Write code to initialize a `Student` struct, if the Student is named "John Smith", is 20 years old, and has a GPA of 3.0. Do it two ways: once all on a single line, and another by using the dot notation for each field (Hint: use `strcpy` for the name field).

3. Create a function that takes a `Student` struct as a parameter (by value) and prints all of its fields on separate lines. Test this using your previous function.

## 2 Function Returning Pointer

1. Write a function that dynamically allocates memory for an integer array of size n from user input, and returns a pointer to it.

2. Create a function that returns a pointer to the largest element in an integer array.

## 3 2D Memory Allocation

1. Write a function that:

   - dynamically allocates an m×n array, by taking in user input
   - initializes all values of the array to 5.

2. Considering how we are initializing the array, is malloc or calloc better for allocation in this case? Explain.

## 4 3D Memory Allocation!

1. Write code to allocate a 3D integer array with dimensions x,y,z from user input and malloc.

2. Print the array elements in order, with z elements on each line.

For extra prep, refer to last week's tutorial notes or textbook content on pointers & memory, and complete Assignment 3 (which should give you a good idea on 2D memory allocation). Good luck!