

EECE.2160: ECE Application Programming

Fall 2017

Lecture 27: Key Questions

November 15, 2017

1. **Example:** Write the following functions that use the `StudentInfo` structure
 - Given a pointer to a single `StudentInfo` variable, print all of the student info to the screen using the following format:
 - Michael J. Geiger
 - ID #12345678
 - GPA: 1.23

 - Given an array of `StudentInfo` variables, compute and return the average GPA of all students in the list

- Prompt the user to enter 3 lines of input (using the format below), read the appropriate values into `StudentInfo` elements, and return a value of type `StudentInfo`
 - Format (user input underlined)
 - Enter name: Michael J. Geiger
 - Enter ID #: 12345678
 - Enter GPA: 1.23

2. Explain how structures can be nested inside one another.

For today's exercise, you will complete the following functions that work with the structures `Name` and `StudentInfo`. The structure definitions are listed below:

```
typedef struct {
    char first[50];
    char middle;
    char last[50];
} Name;

typedef struct {
    Name sname;
    unsigned int ID;
    double GPA;
} SInew;
```

The function descriptions are as follows:

For the `Name` structure:

- **void printName(Name *n):** Print the name pointed to by `n`, using format `<first> <middle>. <last>`
- **void readName(Name *n):** Prompt for and read a first, middle, and last name, and store them in the structure pointed to by `n`

For the `StudentInfo` structure:

- **void printStudent(SInew *s):** Print information about the student pointed to by `s`
- **void readStudent(SInew *s):** Prompt for and read information into the student pointed to by `s`
- **void printList(SInew list[], int n):** Print the contents of an array list that contains `n` `StudentInfo` structures
- **int findByLName(SInew list[], int n, char lname[]):** Search for the student with last name `lname` in the array `list`. Return the index of the structure containing that last name, or -1 if not found
- **int findByID(SInew list[], int n, unsigned int sID):** Search for the student with ID # `sID` in the array `list`. Return the index of the structure containing that last name, or -1 if not found

From Name.c:

```
// Print contents of Name struct
void printName(Name *n) {

}

// Read information into existing Name
void readName(Name *n) {

}

}
```

From SINew.c:

```
// Print information about student
void printStudent(SINew *s) {

}

// Reads student information into existing structure
void readStudent(SINew *s) {

}

}
```

From SInew.c (continued):

```
// Print list of students
void printList(SInew list[], int n) {

}

// Find student in list, based on last name
// Returns index if student found, -1 otherwise
int findByName(SInew list[], int n, char lname[]) {

}

}
```

From SINew.c (continued):

```
// Find student in list, based on ID #  
// Returns index if student found, -1 otherwise  
int findByID(SINew list[], int n, unsigned int sID) {
```

```
}
```