

## Lab12 – Advanced Uses of Pointers

On Dec. 6th

1. Write a program “studentinfo.c” that receives students’ name and exam score and prints out the top-1 and top-2 students’ name. Use structure to store students’ information. The maximum length of the students’ name is 50. The program should stop receiving the students’ information as it receives ‘none’ for the student’s name. The initial number of students is set to 5. Use **malloc** to allocate the memory space for the structures. As it exceeds 5, use **realloc** to allocate the memory space for 5 more students. Whenever it exceeds the current space, allocate the additional space for 5 more students. When quite the program, you must **free** the dynamically allocated space properly:

Name:	David Lee
Score:	75
Name:	Rachel Fox
Score:	60
Name:	Samuel Kim
Score:	96
Name:	Nancy Beatty
Score:	77
Name:	Chris Brown
Score:	85
Name:	Anne Park
Score:	41
Name:	none
Top-1:	Samuel Kim
Top-2:	Chris Brown

2. Modify “studentinfo.c” program above to store student’s name using ‘student\_name’ structure and dynamic memory allocation. When quite the program, you must **free** the dynamically allocated space properly. Receive exam scores of three subjects and compute the average score of each subject among 5 students. Print out the first name of all outstanding students who obtained the exam score that is greater than the average score of each subject. If no such student exists, print out “none”. If there are multiple outstanding students, sort them by the average score of the three subjects in a descending order.

```
struct student_name {  
    char *first;  
    char *last;  
};
```

Name:	David Lee
Score:	75 89 91
Name:	Rachel Fox
Score:	60 100 70
Name:	Samuel Kim
Score:	96 95 95
Name:	Nancy Beatty
Score:	77 78 100
Name:	Chris Brown
Score:	85 94 91
Outstanding student:	Samuel Chris

Name:	David Lee
Score:	75 50 90
Name:	Rachel Fox
Score:	60 95 34
Name:	Samuel Kim
Score:	96 50 30
Name:	Nancy Beatty
Score:	77 100 74
Name:	Chris Brown
Score:	85 84 55
Outstanding student:	none