

**University of Buea    Faculty of Science**  
**Department of Computer Science**

**CSC301 – Algorithms & Data Structures**  
**First Semester 2017/2018**

**Tutorial Sheet I**

1. Write a program that requests the user to input data in two  $4 \times 4$  matrices and then (i) adds them; (ii) subtracts them; and (iii) multiplies them. In each case, your program should display the two input and the result matrices.

2. Assume you want to keep track of student scores. Each student takes three courses, and for each course, you want to keep track of the test score, examination score, and total score, as illustrated in the table on the right. Write a program that uses an array of struct to keep track of the scores of all students of the class. In addition to student scores, your program should keep track of student ID (an integer) and student names (a character array of fixed size).

|       | Test | Exam | Tot |
|-------|------|------|-----|
| Subj1 |      |      |     |
| Subj2 |      |      |     |
| Subj3 |      |      |     |

3. Modify your program in (2) above to used a linked list, instead of an array.
4. Write the output you will see when the following code fragments are run.

```
char* myFunc (char *ptr) {  
    ptr += 3;  
    return (ptr);  
}  
int main(void){  
    char *x, *z;  
    x = "Computer";  
    z = myFunc (x);  
    printf ("z = %s \n", z);  
    return 0;  
}
```

```
int x[] = { 1, 4, 8, 5, 1, 4 };  
int *ptr, y;  
ptr = x + 4;  
y = ptr - x;  
printf("%d\n",y);
```

```
void myFunc (int x) {  
    if (x > 0)  
        myFunc(x-1);  
    printf("%d, ", x);  
}  
int main() {  
    myFunc(5);  
    return 0;  
}
```

5. Write a program to create and display a linked list of  $N$  integers entered on the keyboard until a sentinel number is read.

Add a function `del` to your program above that takes the list head and an integer  $M$ , and deletes the  $M$ th node of the list. Test your function by calling it from `main`, and then displaying the new list.

Add a function `add` that takes the list head and an integer  $M$ , and adds a new node after the  $M$ th node of the list. Test your function by calling it from `main`, and then displaying the new list.

