

COEN 11- Homework 1

Solutions on next week

1. What will this code output (printf)?

```
int main (void)
{
    printf ("%d\n", function_a(5));
    return 0;
}

int function_a (int x)
{
    int y;
    y = function_b (x) + function_b (++x) + function_b (x++);
    return (y + x);
}

int function_b (int z)
{
    return (z * 10);
}
```

Output: 177

2. Write an int function to return the sum of all the elements in an int 2D array. The 2D array has NROWS and NCOLS, both defined as constants. The function will receive the 2D array as an argument. The prototype of the function is: int sum (int[][NCOLS]);

Solution:

```
int sum (int x[][NCOLS])
{
    int i, j, sum=0;
    for (i=0; i < NROWS; i++)
        for (j=0; j< NCOLS; j++)
            sum += x[i][j];
    return sum
}
```

3. Write a function to initialize 2D array x (size MxM) with the following pattern (shown for a 5x5 array):

```
1 0 0 0 1
0 1 0 1 0
0 0 1 0 0
0 1 0 1 0
1 0 0 0 1
```

Solution:

```
void init ()
{
    int i, j;
    for (i=0; i < M; i++)
    {
        for (j=0; j< M; j++)
        {
            if (i == j || i+j == M-1)
                x[i][j] = 1;
            else
                x[i][j] = 0;
        }
    }
}
```

4. Write a function to return the number of sub-strings (sequence of characters with no spaces, tabs, or newlines) in string str received as argument. The prototype of the function is:

```
int count_strings (char *);
```

```

flag=0      'a' 'b' 'c' ' ' 'd' '\t' ' ' ' ' 'd' '\0'
            ^   ^
            counter++  flag=0
            flag=1

```

```

int count_strings (char str[])
{
    int flag=0;
    int counter=0;
    int i=0;
    while (str[i] != '\0')
    {
        if (str[i] != ' ' && str[i] != '\t' && str[i] != '\n')
        {
            if (flag == 0)
            {
                counter++;
                flag = 1;
            }
        }
        else
            flag=0;
        i++;
    }
    return counter;
}

```

5. Write a function to return the length of the longest string in an array of strings (size NROWSxNCOLS) received as argument. Do not use strlen! The prototype of the function is:
int largest_size (char [][][NCOLS]);

```
int largest_size (char strings[][NCOLS])
{
    int largest=0;
    int size, i, j;
    for (i=0; i<NROWS; i++)
    {
        size=0;
        j=0;
        while (strings[i][j] != '\0')
        {
            size++;
            j++;
        }
        if (size > largest)
            largest=size;
    }
    return largest;
}
```