CSE 1242 - COMPUTER PROGRAMMING II
Programming Assignment # 3
DUE DATE: 19/05/2023 - 23:59 (No extension)

In this assignment, you will implement the following programs using C programming language.

1. Write a function that will take one integer pointer, `*number`, and an integer `N`. Then reverse number's last N digits.

- The function header must be as the following:

```
void reverseN(int *number, int N)
```

- You should take input numbers from the user in `main` function and then invoke the function **`reverseN`** with appropriate parameters.
- The **`main`** function should print the result, as the updated value of the number.

Sample Runs:

Run 1:

```
176 2
167
```

Run 2:

```
63712 3
63217
```

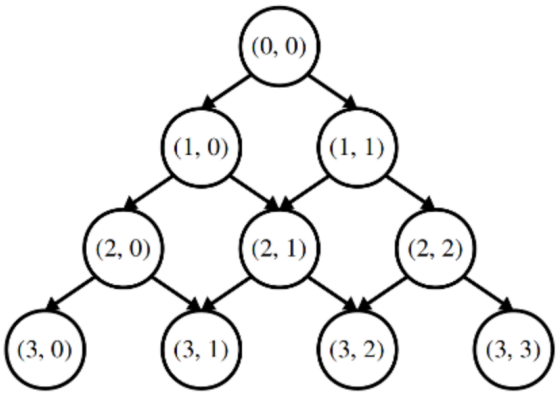
Run 2:

```
32145 5
54123
```

Run 2:

```
345 5
N must be less than 4!
```

2. Suppose that we will build a pyramid with young people for the celebration of May 19th Commemoration of Atatürk, Youth and Sports Day.
The pyramid will look as follows:



Here, each circle shows the column and row ids of each person.

- Suppose that the column and row index of the person at top (in the row 0) is (0, 0). (1, 0) shows the id of the person in the 1st row column 0, etc.
- Suppose that each person weighs exactly 80 kilograms.
- So, the person in the first row (0, 0) has no weight on his/her back.
- However, the person at index (1,0) has 40 kilos (half the weight of the previous person on his/her shoulders) on his/her back.
- Likewise, the person at index (1, 1) has 40 kilos on his/her back because she/he shares half of the person at index (0, 0).
- The people at index (2, 0) and (2, 2) have extra 60 kilos on their backs (the people on the first row (1,0) and (1, 1) have 80+40 kilos individually).
- However, the person at index (2, 1) has 120 kilos on his/her back because he/she weighs the half of the people at (1, 0) and (1, 1).
- In short, each person has extra half weight of the people on his/her shoulders.

Your task is to implement the following function:

```
double calculateWeightBack(int row, int col)
```

that takes the row and column index of a person and returns the total weight on his/her back.
Please implement the function in two ways:

- In the first version, please implement using *ITERATION*.
- In the second version, please implement it using *RECURSION*.
    - In the recursive version, you are not allowed to use loops or any global values. Your calculations must be done only with recursive calls.
- You can put both implementations into your source code with different names.
- Do not forget to invoke both versions in the main function.

- Please assume that there might be at most 30 levels.

- **It should be noted that <u>selected parts</u> will be graded in your homework.**

Submission Instructions

Please zip and submit your files using filename YourNumberHW3.zip
(ex: 150713852HW3.zip) to Canvas system (under Assignments tab).
Your zip file should contain the following 3 files:

1. C source code for Q1 (Pro3_1_150713852.c)
2. C source code for Q2 (Pro3_2_150713852.c)

Your program must include necessary comments with your own words to explain your actions!

Notes:

1. Write a comment at the beginning of each program to explain the purpose of the program.
2. Write your name and student ID as a comment.
3. Include necessary comments to explain your actions.
4. Select meaningful names for your variables and class names.
5. You are allowed to use the materials that you have learned in lectures & labs.
6. Do not use things that you did not learn in the course.
7. **Program submissions** should be done through the Canvas class page, under the assignments tab. Do not send program submissions through e-mail. E-mail attachments will not be accepted as valid submissions.
8. You are responsible for making sure you are turning in the right file, and that it is not corrupted in anyway. We will not allow resubmissions if you turn in the wrong file, even if you can prove that you have not modified the file after the deadline.
9. In case of any form of **copying and cheating** on solutions, all parts will get **ZERO** grade. You should submit your own work. In case of any forms of cheating or copying, both giver and receiver are equally culpable and suffer equal penalties.
   All types of plagiarism will result in zero grade from the homework.
10. No late submission will be accepted.