Question 1:

Write a C program that reads a positive integer *n* and then displays the value of the term Un of the sequence (Un) and summation of the first n terms S given by:

$$U_n = U_{n-1} + 2*U_{n-2} + 1$$

with $U_0 = 2, U_1 = 1$
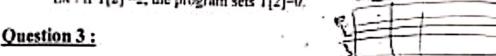$$S = U_0 + U_1 \dots U_n$$

Question 2 :

Write a C program that:

a) Declares and fills the elements of an array of integers T[10].
b) Sets to 0 each element of the array T having value equals to its index (its position in the array).
   Ex : if T[2] =2, the program sets T[2]=0.

Question 3 :

We suppose that you are responsible for organizing the calculation of the goals in the world cup football competitions « Mondial » by realizing a program in C-language. To simplify the task, it is assumed that 4 teams participate in the competition, each team has 11 players numbered from 1 to 11.

The 4 teams played in total 4 matches in this competition. We use a matrix M[4][11] to store the total number of goals scored by each player in the competition. Each row represents a team. (M[i][j] indicates the total number of goals scored by the player j of the team i).

Write a C program that :

a) Fills the matrix M, in case we have the following results:

The team 1 : *The player* number 3 scored 1 goal,
The player number 6 scored 1 goal,
The player number 10 scored 3 goals.

The team 2 : *The player* number 5 scored 1 goal,
The player number 8 scored 2 goals,
The player number 10 scored 1 goal.

The team 3 : *The player number 4 scored 2 goals.*
The player number 7 scored 1 goal.
The player number 10 scored 2 goals
The team 4 : no player in this team scored goals.

b) Calculates and displays the total number of goals scored in this competition (i.e. the program displays the following information: the total number of goals scored = ...).

c) Finds the player in each team that scored the highest number of goals by indicating its number (ie. the program displays the following information: team 1: the player ... scored the highest number, team 2: the player ... scored the highest number, etc.)

d) Finds and displays the indexes (i,j) of the players who did not score any goal.

e) Calculates and displays the number of goals for each team (ie. the program displays the following information: nb of goals of the team 1=..., nb of goals of the team 2=..., etc.) and then displays which team has scored the highest number of goals (ie. the program displays the following information: The team number... has socred the highest number of goals).

f) Calculates and displays for each number of players (1, 2, ...11) the total number of goals scored by the different teams (ie. the program displays the following information: nb of goals of players 1 of all teams = ..., nb of goals of players 2 of all teams =... etc.).

Question 4:

a) Write a function (*void displayDivisors(int n)*) that takes as parameter an integer n and displays all the divisors of n.
  ex: n=12, the function displays 1, 2, 3, 4, 6, 12.

b) Write a function (*int sumPower(int n)*) that takes as parameter an integer n and returns as result the sum: $1^2 + 2^3 + 3^4 + ... + n^{n+1}$

Good Luck