Dynamic Programming Project

Maximum Board Value

Given an NxN board, where each cell in the board contains an integer value. The value could be negative, zero or positive. A game is played by one player. The player starts from an arbitrary cell and then moves in the board in a series of steps. In each step the player moves one cell, either down or to the right. In each step the player collects the value of the visited cell. The game ends when the player goes off any of the edges of the board.
Your task is 1- to find the maximum value you can accumulate until you go off the board. 2- once you find this maximum print the sequence of cell values that you followed to get this maximum value. You are allowed to start at any cell that gets you the maximum value.

Example 1 - (4x4 Board):

-17	-22	-13	-45
-58	-76	48	-20
-78	-97	84	34
98	-95	56	-54

The shaded cells are the ones that results in the maximum value.
The maximum value is:**188**
Sequence of cell values: **48, 84, 56**

Example 2- (4x4 Board):

17	-79	30	3
-23	12	-63	-75
72	-90	93	93
16	87	14	-42

The shaded cells are the ones that results in the maximum value.
The maximum value is:**189**
Sequence of cell values: **72, 16, 87,14**

Here is a reminder of the outline of your solution:

Part1: Divide & Conquer

1- Define the value returned by the function *f* which we want to optimize.

2- Define the parameters which *f* depends on.

3- Draw the recursion tree for *f* using the values from the example above.

4- Write the recursive (divide and conquer) code to solve the question.

Part2: Dynamic Programming

5- Draw the table and determine the dependencies between the table cells.

6- Determine the direction of movement within the table.

7- Write the Dynamic programming code which fills the table(s).

8- Write the code that will print the sequence of moves that get you the solution.

You are requested to submit a report that explains each of the steps above which also includes graphs and figures to explain your solution and the rationale behind it. Also you need to submit your working code on the hackerrank website as usual.

Your task in the homework is to print the sequence of cell values that gets you that maximum value.

The link will be provided on Moodle/FB Group.

There will be no tolerance towards cheating & copying.

Good Luck

Dr. Samer Arandi