

Greatest Path Sum in a Grid (Due 02 Oct 2020)

Assume that you have square grid of positive integers. You want to start at the top left corner in the grid and work your way down to the bottom right corner. The constraint that you have is that you can only move either to the right or down from your current position in the grid. You want to take the path that gives you the greatest sum.

Input:

You will read your data from standard input in the following format: [grid.txt](#). The first line in input will be the dimension n of this square grid. The dimension of the grid will be between 5 and 40 inclusive. It will be followed by n lines of data. Each line will have n positive integers between 1 and 99 inclusive.

Output:

First you will print to standard out the total number of paths in the grid and then you will output the greatest path sum in the grid. You do NOT have to output the actual path.

Here is the template of the code (Grid.py) that you will be submitting. You may **NOT** change the names of the functions but you may add as many helper functions as needed. You will follow the [standard coding conventions](#) in Python.

```
# counts all the possible paths in a grid
def count_paths (n):

# gets the greatest sum of all the paths in the grid
def path_sum (grid, n):

def main():
    # read data from standard input

    # read the dimension of the grid

    # create an empty grid

    # populate the grid

    # get the number of paths in the grid and print
    num_paths = count_paths (dim)
    print (num_paths)
    print ()

    # get the maximum path sum and print
    max_path_sum = path_sum (grid, dim)
    print (max_path_sum)

if __name__ == "__main__":
    main()
```

You may not change the function signatures of *count_paths()* and *path_sum* . You may add any helper functions that you may need. For the test grid, the sample output will look like:

48620

1117

For this assignment you may work with a partner. Both of you must read the paper on [Pair Programming](#) and abide by the ground rules as stated in that paper. If you are working with a partner then only one of you will submit the code. Make sure that in the header in HackerRank that you have your name and UT EID and your partner's name and UT EID. If you are working alone then you will just have your name and your UT EID.

Use the *HackerRank* platform to submit your code. We should receive your work by 11 PM on Friday, 02 Oct 2020. There will be substantial penalties if you do not adhere to the guidelines. HackerRank will not assign late penalties (if any), we will make the adjustments.

- Your code must run before submission.
- You should be submitting your file through the web based [HackerRank](#) platform. We will not accept files e-mailed to us.