

<b>Started on</b>	Wednesday, 19 March 2025, 9:45 AM
<b>State</b>	Finished
<b>Completed on</b>	Wednesday, 19 March 2025, 11:53 AM
<b>Time taken</b>	2 hours 7 mins
<b>Overdue</b>	7 mins 30 secs
<b>Grade</b>	<b>100.00</b> out of 100.00

## Question 1

Correct

Mark 20.00 out of 20.00

Write a python program to implement merge sort without using recursive function on the given list of values.

For example:

Input	Result
7	left: [33]
33	Right: [42]
42	left: [9]
9	Right: [37]
37	left: [8]
8	Right: [47]
47	left: [5]
5	Right: []
	left: [33, 42]
	Right: [9, 37]
	left: [8, 47]
	Right: [5]
	left: [9, 33, 37, 42]
	Right: [5, 8, 47]
	[5, 8, 9, 33, 37, 42, 47]
6	left: [10]
10	Right: [3]
3	left: [5]
5	Right: [61]
61	left: [74]
74	Right: [92]
92	left: [3, 10]
	Right: [5, 61]
	left: [74, 92]
	Right: []
	left: [3, 5, 10, 61]
	Right: [74, 92]
	[3, 5, 10, 61, 74, 92]

Answer: (penalty regime: 0 %)

```
1 def merge(left,right):
2     result = []
3     x,y = 0, 0
4     for k in range(0, len(left) + len(right)):
5         if x == len(left):
6             result.append(right[y])
7             y +=1
8         elif y == len(right):
9             result.append(left[x])
10            x +=1
11        elif right[y] < left[x]:
12            result.append(right[y])
13            y +=1
14        else:
15            result.append(left[x])
16            x +=1
17    return result
18 def mergesort(ar_list):
19     length=len(ar_list)
20     size=1
21     while size < length:
22         size+=size
```

	Input	Expected	Got	
✓	7 33 42 9 37 8 47 5	left: [33] Right: [42] left: [9] Right: [37] left: [8] Right: [47] left: [5] Right: [] left: [33, 42] Right: [9, 37] left: [8, 47] Right: [5] left: [9, 33, 37, 42] Right: [5, 8, 47] [5, 8, 9, 33, 37, 42, 47]	left: [33] Right: [42] left: [9] Right: [37] left: [8] Right: [47] left: [5] Right: [] left: [33, 42] Right: [9, 37] left: [8, 47] Right: [5] left: [9, 33, 37, 42] Right: [5, 8, 47] [5, 8, 9, 33, 37, 42, 47]	✓
✓	6 10 3 5 61 74 92	left: [10] Right: [3] left: [5] Right: [61] left: [74] Right: [92] left: [3, 10] Right: [5, 61] left: [74, 92] Right: [] left: [3, 5, 10, 61] Right: [74, 92] [3, 5, 10, 61, 74, 92]	left: [10] Right: [3] left: [5] Right: [61] left: [74] Right: [92] left: [3, 10] Right: [5, 61] left: [74, 92] Right: [] left: [3, 5, 10, 61] Right: [74, 92] [3, 5, 10, 61, 74, 92]	✓
✓	5 4 12 6 98 3	left: [4] Right: [12] left: [6] Right: [98] left: [3] Right: [] left: [4, 12] Right: [6, 98] left: [3] Right: [] left: [4, 6, 12, 98] Right: [3] [3, 4, 6, 12, 98]	left: [4] Right: [12] left: [6] Right: [98] left: [3] Right: [] left: [4, 12] Right: [6, 98] left: [3] Right: [] left: [4, 6, 12, 98] Right: [3] [3, 4, 6, 12, 98]	✓

Passed all tests! ✓

Correct

Marks for this submission: 20.00/20.00.

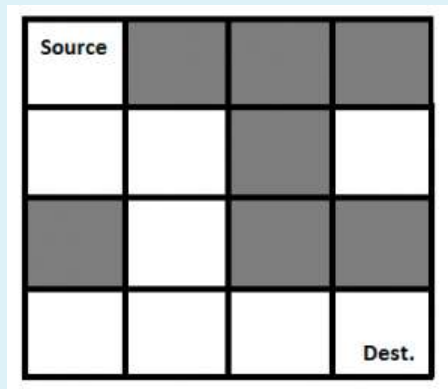
## Question 2

Correct

Mark 20.00 out of 20.00

## Rat In A Maze Problem

You are given a maze in the form of a matrix of size  $n \times n$ . Each cell is either clear or blocked denoted by 1 and 0 respectively. A rat sits at the top-left cell and there exists a block of cheese at the bottom-right cell. Both these cells are guaranteed to be clear. You need to find if the rat can get the cheese if it can move only in one of the two directions - down and right. It can't move to blocked cells.



Provide the solution for the above problem Consider  $n=4$ )

The output (Solution matrix) must be  $4 \times 4$  matrix with value "1" which indicates the path to destination and "0" for the cell indicating the absence of the path to destination.

Answer: (penalty regime: 0 %)

Reset answer

```

1 N = 4
2
3
4 def printSolution( sol ):
5
6     for i in sol:
7         for j in i:
8             print(str(j) + " ", end = "")
9             print("")
10
11
12 def isSafe( maze, x, y ):
13
14     if x >= 0 and x < N and y >= 0 and y < N and maze[x][y] == 1:
15         return True
16
17     return False
18
19
20 def solveMaze( maze ):
21     sol = [ [ 0 for j in range(4) ] for i in range(4) ]
22

```

	Expected	Got	
✓	1 0 0 0 1 1 0 0 0 1 0 0 0 1 1 1	1 0 0 0 1 1 0 0 0 1 0 0 0 1 1 1	✓

Passed all tests! ✓

Correct

Marks for this submission: 20.00/20.00.

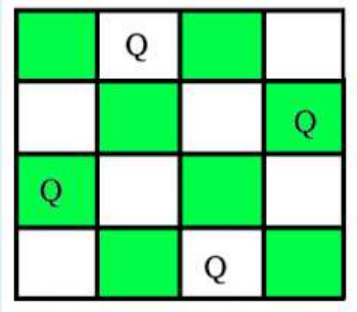
## Question 3

Correct

Mark 20.00 out of 20.00

You are given an integer **N**. For a given **N x N** chessboard, find a way to place '**N**' queens such that no queen can attack any other queen on the chessboard.

A queen can be attacked when it lies in the same row, column, or the same diagonal as any of the other queens. **You have to print one such configuration.**



**Note :**

Get the input from the user for **N** . The value of **N** must be from 1 to 4

If solution exists Print a binary matrix as output that has 1s for the cells where queens are placed

If there is no solution to the problem print "Solution does not exist"

For example:

Input	Result
4	0 0 1 0 1 0 0 0 0 0 0 1 0 1 0 0

**Answer:** (penalty regime: 0 %)

Reset answer

```

1 global N
2 N = int(input())
3
4 def printSolution(board):
5     for i in range(N):
6         for j in range(N):
7             print(board[i][j], end = " ")
8         print()
9
10 def isSafe(board, row, col):
11     for i in range(col):
12         if board[row][i] == 1:
13             return False
14
15     for i, j in zip(range(row, -1, -1),
16                     range(col, -1, -1)):
17         if board[i][j] == 1:
18             return False
19
20     for i, j in zip(range(row, N, 1),
21                     range(col, -1, -1)):
22         if board[i][j] == 1:

```

	Input	Expected	Got	
✓	4	0 0 1 0 1 0 0 0 0 0 0 1 0 1 0 0	0 0 1 0 1 0 0 0 0 0 0 1 0 1 0 0	✓
✓	2	Solution does not exist	Solution does not exist	✓

Passed all tests! ✓

Correct

Marks for this submission: 20.00/20.00.

## Question 4

Correct

Mark 20.00 out of 20.00

**SUBSET SUM PROBLEM**

We are given a list of n numbers and a number x, the task is to write a python program to find out all possible subsets of the list such that their sum is x.

Examples:

**Input:** `arr = [2, 4, 5, 9], x = 15`

**Output:** `[2, 4, 9]`

15 can be obtained by adding 2, 4 and 9 from the given list.

**Input :** `arr = [10, 20, 25, 50, 70, 90], x = 80`

**Output :** `[10, 70]`

`[10, 20, 50]`

80 can be obtained by adding 10 and 70 or by adding 10, 20 and 50 from the given list.

**THE INPUT**

1.No of numbers

2.Get the numbers

3.Sum Value

For example:

Input	Result
4 2 4 5 9 15	[2, 4, 9]
5 4 16 5 23 12 9	[4, 5]

**Answer:** (penalty regime: 0 %)

Reset answer

```

1
2 from itertools import combinations;
3
4 def subsetSum(n, arr, x):
5
6     for i in range (n+1):
7         for subset in combinations(arr, i):
8             if sum(subset) == x:

```



```

9      print(list(subset))
10
11     n=int(input())
12     arr=[]
13     for i in range(0,n):
14         a=int(input())
15         arr.append(a)
16     x = int(input())
17
18     subsetSum(n, arr, x)
19

```

	Input	Expected	Got	
✓	4 2 4 5 9 15	[2, 4, 9]	[2, 4, 9]	✓
✓	6 10 20 25 50 70 90 80	[10, 70] [10, 20, 50]	[10, 70] [10, 20, 50]	✓
✓	5 4 16 5 23 12 9	[4, 5]	[4, 5]	✓

Passed all tests! ✓

Correct

Marks for this submission: 20.00/20.00.

## Question 5

Incorrect

Mark 20.00 out of 20.00

**GRAPH COLORING PROBLEM**

Given an undirected graph and a number  $m$ , determine if the graph can be coloured with at most  $m$  colours such that no two adjacent vertices of the graph are colored with the same color. Here coloring of a graph means the assignment of colors to all vertices.

Input-Output format:

*Input:*

1. A 2D array `graph[V][V]` where  $V$  is the number of vertices in graph and `graph[V][V]` is an adjacency matrix representation of the graph. A value `graph[i][j]` is 1 if there is a direct edge from  $i$  to  $j$ , otherwise `graph[i][j]` is 0.
2. An integer  $m$  is the maximum number of colors that can be used.

*Output:*

An array `color[V]` that should have numbers from 1 to  $m$ . `color[i]` should represent the color assigned to the  $i$ th vertex.

**Example:****Input:**

```
graph = {0, 1, 1, 1},
         {1, 0, 1, 0},
         {1, 1, 0, 1},
         {1, 0, 1, 0}
```

**Output:**

Solution Exists:

Following are the assigned colors

1 2 3 2

**Explanation:** By coloring the vertices with following colors, adjacent vertices does not have same colors

**Input:**

```
graph = {1, 1, 1, 1},
         {1, 1, 1, 1},
         {1, 1, 1, 1},
         {1, 1, 1, 1}
```

**Output:** Solution does not exist.

**Explanation:** No solution exists.

**Answer:** (penalty regime: 0 %)

```
1 class Graph:
2     def __init__(self,vertices):
3         self.V=vertices
```

	Test	Expected	Got	
✖	<pre>g = Graph(4) g.graph = [[0, 1, 1, 1], [1, 0, 1, 0], [1, 1, 0, 1], [1, 0, 1, 0]] m = 3 g.graphColouring(m)</pre>	<p>Solution exist and Following are the assigned colours:</p> <pre>1 2 3 2</pre>	<pre>***Run error*** Traceback (most recent call last):   File "__tester__.python3", line 14, in &lt;module&gt;     g.graphColouring(m) AttributeError: 'Graph' object has no attribute 'graphColouring'</pre>	✖

Your code must pass all tests to earn any marks. Try again.

Show differences

Incorrect

Marks for this submission: 0.00/20.00.