Maximum Sum of Hourglass In Matrix

1) What is an hourglass in a matrix?

- **A subset of values that form a 3x3 pattern**
- A subset of values that form a 4x4 pattern
- A subset of values that form a 2x2 pattern
- A subset of values that form a 5x5 pattern

Ans: A subset of values that form a 3x3 pattern

2) How many values form an hourglass in a matrix?

- 4
- 6
- 8
- **7**

Ans: 7

3) What is the maximum sum of an hourglass in a matrix?

- The sum of all the values in the matrix
- The sum of all the values in the middle row of the matrix
- The sum of all the values in the middle column of the matrix
- **The sum of all the values in every hourglass in the matrix**

Ans: The sum of all the values in every hourglass in the matrix

4) What is the space complexity of finding the maximum sum of an hourglass in a matrix using brute force?

- **O(1)**
- O(n)
- O(n^2)
- O(n^3)

Ans: O(1)

5)What is the best way to find the maximum sum of an hourglass in a matrix?

- Brute force
- **Dynamic programming**
- Sorting
- Randomized algorithms

Ans: Dynamic programming

6)Which of the following algorithms can be used to find the maximum sum of an hourglass in a matrix?

- **Kadane's algorithm**
- Dijkstra's algorithm
- Bellman-Ford algorithm
- Kruskal's algorithm

Ans: Kadane's algorithm

7) Which of the following is an advantage of using Kadane's algorithm to find the maximum sum of an hourglass in a matrix?

- It is faster than brute force
- It has lower space complexity than brute force
- It can handle matrices of any size
- **All of the above**

Ans: All of the above

8)Which of the following is a disadvantage of using Kadane's algorithm to find the maximum sum of an hourglass in a matrix?

- **It may not work for some matrices**
- It is more complex than brute force
- It requires more memory than brute force
- None of the above

Ans: It may not work for some matrices

9) What is the difference between an hourglass and a submatrix in a matrix?

- An hourglass has a diamond shape, while a submatrix can have any shape
- An hourglass has nine values, while a submatrix can have any number of values
- **An hourglass is a specific type of submatrix that has a 3x3 shape**
- There is no difference

Ans: An hourglass is a specific type of submatrix that has a 3x3 shape

10) How can you access an element in a two-dimensional array in Java?

- Using a single index
- **Using two indices**
- Using a HashMap
- Using a LinkedList

Ans: Using two indices