Home Work

Matrices

1. Consider following matrices of given sizes:

Matrix	Rows	Columns
A	10	100
B	100	5
C	5	50

   Calculate the cost of following operations:

   a. (A * B) * C
   b. A * (B * C)

2. Whether the answer of Q1(a) and Q1(b) are same or different? Why?

3. What is a Sparse Matrix? What is Three Column Representation (aka as Triplet Representation) for sparse matrices?

4. What is a Jagged Array and how is it different from an array?

5. Design and implement a class that allows a teacher to track the grades in a single course. Include methods that calculate the average grade, the highest grade, and the lowest grade. Write a program to test your class implementation (taken from Data Structure and Algorithms using C#)

6. Write a function that return diagonal of an array.
   int[] GetDiagonal(int[,] array)

7. Write a function to return the sum of all elements in an array.
   int GetSum(int[.] array)

8. Write a function to return the maximum element in an array
   int GetMax(int[.] array)

9. Write a function to find whether the given matrix is symmetric or not
   bool IsSymmetric(int[,] array)

10. Write a function that receive a two-dimension matrix and convert into a triplet representation
    int[,,] GetTriplet(int[,] array)

11. Write a function that receive a sparse matrix (in triplet form) and return a two dimension matrix.
    int[,] GetMatrix(int[,] sparse)

12. Write a function that receive two sparse matrices (in Triplet representation) and return the sum of both matrices

   int[,] SumSparse(int[,] array1, int[,] array2)

Resources:

- Sparse Matrix (http://btechsmartclass.com/DS/U1_T14.html)
- Sparse Matrix(2D-Array):Basic and Three Column Representation (https://www.youtube.com/watch?v=WHdVUbeVnTg)
- Symmetric Matrix (https://en.wikipedia.org/wiki/Symmetric_matrix)