1. Write a program that fills and prints a matrix of size (n, n) as shown below: (examples for n = 4) cases: a),b),c),d)

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 8 | 9 | 16 |
| 2 | 7 | 10 | 15 |
| 3 | 6 | 11 | 14 |
| 4 | 5 | 12 | 13 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 5 | 9 | 13 |
| 2 | 6 | 10 | 14 |
| 3 | 7 | 11 | 15 |
| 4 | 8 | 12 | 16 |

a) b)

|  |  |  |  |
| --- | --- | --- | --- |
| 7 | 11 | 14 | 16 |
| 4 | 8 | 12 | 15 |
| 2 | 5 | 9 | 13 |
| 1 | 3 | 6 | 10 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 12 | 11 | 10 |
| 2 | 13 | 16 | 9 |
| 3 | 14 | 15 | 8 |
| 4 | 5 | 6 | 7 |

c) d)\*

1. Write a program that reads a rectangular matrix of size N x M and finds in it the square 3 x 3 that has maximal sum of its elements.
2. We are given a matrix of strings of size N x M. Sequences in the matrix we define as sets of several neighbor elements located on the same line, column or diagonal. Write a program that finds the longest sequence of equal strings in the matrix. Example:

|  |  |  |  |
| --- | --- | --- | --- |
| ha | fifi | ho | hi |
| fo | ha | hi | xx |
| xxx | ho | ha | xx |

🡪 ha, ha, ha

|  |  |  |
| --- | --- | --- |
| s | qq | s |
| pp | pp | s |
| pp | qq | s |

🡪 s, s, s

1. Write a program, that reads from the console an array of N integers and an integer K, sorts the array and using the method Array.BinarySearch() finds the largest number in the array which is ≤ K.
2. You are given an array of strings. Write a method that sorts the array by the length of its elements (the number of characters composing them).