**מחשוב מקבילי ומבוזר**

תרגיל #4

**The purpose of this exercise is to practice the MPI Cartesian Topology**

Write a parallel program to implement **Shearsort Algorithm** to sort a set of points with a distance from a point to the origin (10, 20) as criteria to compare two points

**Requirements**:

* One of the processes reads **n2** points from the file. This process will display the points before and after the sort.
* Use Cartesian Topology for communication between processors.
* At the end of the program the points are displayed in ascending order of distances from the point (10, 20).
* Use **Odd Even Sort** to sort rows and columns
* Assume that **n** is even
* The input file is organized as following:

Number of points

x1 y1

x2 y2

…

Xlast ylast

For example

4

1.2 3.4

3. 5 -1.0

3. 3 5.1

4.9 6.7

Note:

You need **(2log(n)+1)** row/column phases to sort **n2** words.

**Grading Policy**:

* **10 points** for code quality:
  1. The code have to be divided into small functions (not more than 40 lines of code).
  2. Use meaningful names for variables, functions, files, constants.
  3. Place enough comments to understand the code
  4. No unused lines of code. Don't repeat the code – use functions!
  5. Write README.TXT file if special instructions are needed to run the solution. The file has to be in the root folder of the solution.
* **90 points** – for proper implementation the requirements.
* The Homework has to be delivered in time. No delay will be accepted.

**Important:**

* The homework may be performed in pairs. Each member of the pair has to submit the solution through the Moodle.
* The **whole project** have to be zipped and named as

**111111111\_222222222.zip**

Where **111111111** is ID of the one student and **222222222** is Id of another student.

בהצלחה