Analysis for task "Sorting machine"

CodeIT, 2014-2015, Round 6

In the author solution the indexing of the boxes starts from 0.

In order to move all balls from box **i** to box **j** we have to do the following - we choose to rotate along one of the two directions, then we move the balls from one box to the next, starting from box **i**, until we reach box **j**. This way the amount of moves required is **moves(i,j) = Ki \* dist**, where **Ki** = number of balls in box **i** and **dist** = the distance from **i** to **j** along the direction we chose.

The two possible distances for the path from box **i** to box **j** are **|i-j|** and **n-|i-j|**. Obviously we are interested only in the shorter path, so we can change our formula to

**moves(i,j) = Ki \* min(|i-j|, n-|i-j|)**.

The task is solved by a brute force aproach. For each box we check the required number of operations to move all balls in it. Let **finBox** = the box we will move the balls to. Then the number of moves is **allMoves =** the sum of **moves(i, finBox)** for **i = 0 ... n-1**.

In the end the answer is the smallest number **allMoves** we found.

Author: Nikola Stoyanov