Middle East Technical University
Department of Computer Engineering

CENG 111

Fall '19

Take Home Exam 2

REGULATIONS

Due date: December 8, 2019, Sunday, 23:59
(Not subject to postpone)

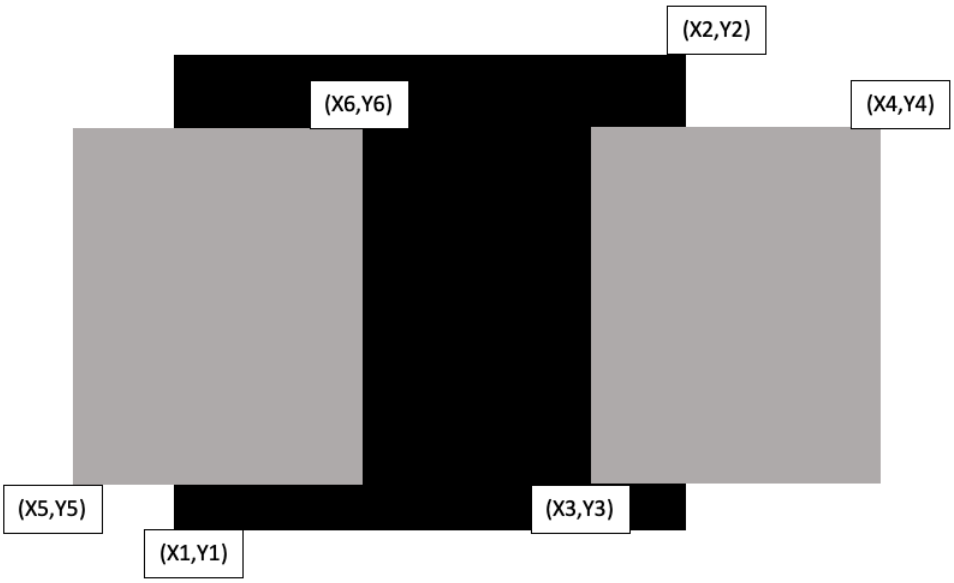
Submission: Electronically. You will be submitting your program source code written in a file which you will name as `the2.py` via CengClass. Resubmission is allowed (till the last moment of the due date), The last will replace the previous.

Team: There is **no** teaming up. The take home exam has to be done/turned in individually.

Cheating: This is an exam: all parts involved (source(s) and receiver(s)) get zero+parts will be subject to disciplinary action.

INTRODUCTION

A coal mining company stores the mined coals in a rectangular pit whose edges are parallel to the coordinate axes. The pit is identified by the coordinates of its lower left corner, (X1, Y1), and its upper right corner, (X2, Y2) (See the figure below). Two rectangular gray tarp covers are overlaid on the pit with specific positions and their edges are also parallel to the coordinate axes. The tarps may be of different sizes and the areas that they cover over the pit may overlap. The tarps are also identified by a pair of points specifying their lower left and upper right corners as shown in the figure below.



PROBLEM

In this take home exam, your goal is to determine whether the coal pit is completely covered by the gray tarps. The coal pit will not be completely covered, if there is at least one point on the coal pit (including the boundaries) that is strictly outside of both the gray tarps. Write a Python function that takes as parameters the bottom left and top right coordinates of the coal storage pit and the two tarps as 6 tuples of non-negative integer coordinates and return one of the two strings "COMPLETELY COVERED" or "NOT COMPLETELY COVERED" depending on whether the tarps completely cover the coal pit or not.

SPECIFICATIONS

- You should implement a python function with the following prototype:

  ```
  def isCovered(cp_bl, cp_tr, t1_bl, t1_tr, t2_bl, t2_tr)
  ```

  where cp_bl and cp_tr are tuples specifying the bottom left and the top right coordinates of the coal pit. Similarly, t1_bl and t1_tr are the bottom left and the top right coordinates of the first tarp, and t2_bl and t2_tr are the bottom left and the top right coordinates of the second tarp. All the coordinates will be non-negative integers.

  Your function should return a string with either one of the values "COMPLETELY COVERED" or "NOT COMPLETELY COVERED".

- Importing any module and using any form of loop or recursion are **not allowed** and **not necessary** for solving the given problem.

- Your function will not be called with erroneous input.

SAMPLE FUNCTION CALLS

```
>>> isCovered((5,2), (10,5), (8,1), (11,7), (3,1), (7,6))
'NOT COMPLETELY COVERED'


>>> isCovered((0,0), (3,3), (5,5), (6,6), (0,0), (4,4))
'COMPLETELY COVERED'
```

GRADING

- Comply with the specifications. Since your returned results will be evaluated automatically, non-compliant results will be considered as incorrect by our evaluation system.

- Your program will be tested with multiple data (a distinct run for each data).

- Each incorrect result of your program will have a negative punishment (this punishment will be set according to number of test cases), which means that any program based on randomness will be graded zero.

- Any program that performs only 30% and below will enter a glass-box test (eye inspection by the grader TA). The TA will judge an overall **THE2** grade in the range of [0,30]. The glass-box test grade is not open to negotiation nor explanation.