# -----------------------------------------------------------------------------

# Name: utils

# Purpose: Useful functions for homework 7

#

# -----------------------------------------------------------------------------

**def** **manhattan\_distance**(point1, point2):

"""

Compute the Manhattan distance between two points.

:param point1 (tuple) representing the coordinates of a point in a plane

:param point2 (tuple) representing the coordinates of a point in a plane

:return: (integer) The Manhattan distance between the two points

"""

x1, y1 = point1

x2, y2 = point2

distance = abs(x1 - x2) + abs(y1 - y2)

**return** distance

**def** **closest\_point**(point1, other\_points):

"""

Find the coordinates of the closest point to point1

:param point1 (tuple) representing the coordinates of a point in a plane

:param other\_points(set) representing several points in a plane

:return: (tuple) the coordinates of the closest point to point1

"""

**if** **not** other\_points:

**return** None

closest = min(other\_points, key=**lambda** p:manhattan\_distance(point1, p))

**return** closest