

Problem : Corys Coins - Solution

Suppose we have the two pictures $p1$ and $p2$. Then, suppose we fix the coordinates of $p2$ relative to the coordinates of picture $p1$. Then, to see find the number of coin changes between the two sets, we simply taking the intersection of the two pictures. All the coins that lie outside of the intersection need to move. Now, since the coins are sparse, we need to be slightly clever about how to calculate this intersection. So, we deconstruct $p2$ as a list of locations $(x2, y2)$. Then, we loop over the first picture and for each location $(x1, y1)$ if there is a coin there, we loop over all the coordinates in the location list of $p2$. Then, we can view these two coins being associated to a picture $p2$ which is anchored at $(x1 - x2, y1 - y2)$. So, then we can keep track of how many intersections occur for this location in a dictionary. So, we find for each location of $p2$ how many coins intersect with $p1$. Then, we can take the maximum and subtract this from the total number of coins to find the minimum number of coin movements.