COSC 6111 Advanced Design and Analysis of Algorithms
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Assignment: Greedy

First Person:
    Family Name:
    Given Name:
    Student #:
    Email:

Second Person:
    Family Name:
    Given Name:
    Student #:
    Email:

Problem Name	If Done Old Mark	Check if to be Marked	New Mark
1 Magic Game			

1. One aspect of the game Magic (or Jugio) is as follows. You have n defense cards, the ith of which, denoted D_i, has worth w_i and defense ability d_i. Your opponent has n attack cards, the jth of which, denoted A_j, has attack ability a_j. You can see all of the cards. Your task is to define a 1-1 matching between the attacking cards and the defending cards, that is, each attack card is allocated to a unique defense card. If card D_i is defending against A_j and $d_i < a_j$, then he dies. Your goal is to maximize the sum of the worth w_i of your cards that live. Give your algorithm. Then prove that it works.