

# Worksheet 1: SMP

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## **Step 3: Identify similar problems. What are the similarities?**

1. Marriage Problem (Stable Marriage Problem), where each men has their own primary choice, each women has their own primary choice, and each person has a preference list.
2. Admission-Student problem, where each student has their own primary choice for colleges, and each college has their own primary choice for students, each party also has a preference list.

## **Step 4: Evaluate simple algorithmic approaches, such as brute force.**

1. Brute force algorithm
  - (a) Each student has a preference list of employers, and each employer has a preference list of students.
  - (b) Employer-optimal choice: For all employers  $E = e_1, e_2, \dots, e_n$  we will access their preference list  $P(e_i)$ , add all the match to another list  $M$ . looping through all of the students  $S = s_1, s_2, \dots, s_n$  and checking each of their own preference list  $P(s_i)$  add all the match to another list  $M$ .
  - (c) Student-optimal choice: For all students  $S = s_1, s_2, \dots, s_n$  we will access their preference list  $P(s_i)$ , and match it by looping through all of the employers  $E = e_1, e_2, \dots, e_n$  and checking each of their own preference list  $P(e_i)$ , add all the match to another list  $M$ .