

Assignment 0:

1. Change the output to indicate the sum of all preferences achieved for each group. In Matching the employees achieved ($2+2+1+1 = 6$) and the applicants achieved ($3+3+3+3=12$)

```
def calculate_preference_sum(person_dict):  
    sum_of_preferences = 0  
    for person in person_dict.values():  
        if person.partner:  
            sum_of_preferences += person.rank  
    return sum_of_preferences
```

```
print("Sum of preferences for employers:", calculate_preference_sum(employers))  
print("Sum of preferences for applicants:", calculate_preference_sum(applicants))
```

2. Create an example for which the results are the same, no matter who proposes.

For this segment of the assignment, I kept the same structures from match.py and match2.py but adjusted the .txt files ApplicantsEX.txt and EmployersEX.txt) With this I decided to make each side equal 8 for a total of 16. I played with the original files however I could not find a solution where the sums were equal. Whereas in the data pools that I created I was able to manually adjust them to ensure that both sides had the same sums. I do think that it would be possible to have the sums equal to each other without composing my own data file however, it would change a bit of the original algorithm. I also created a version with two applicants and two employers which was much easier to make the sums equal.

The Applicant file I created:

- a: E,H,G,F
- b: E,F,G,H
- c: F,G,E,H
- d: G,E,H,F

The Employer File I created:

- E: a,b,c,d
- F: c,b,d,a
- G: a,c,b,d
- H: c,a,d,b

MY OUTPUTS PER FILE:

match.py - The original project with "Sum of Preferences" added.

OUTPUT:

/home/rylei/Documents/CS5110/Project0/.venv/bin/python

/home/rylei/Documents/CS5110/Project0/match.py

working with files ('Employers.txt', 'Applicants.txt', True)

Unmatched employers ['a', 'b', 'c', 'd']

a proposes to B

B accepts the proposal

Tentative Pairings are as follows:

a 1 is paired with B 4

b is NOT paired

c is NOT paired

d is NOT paired

Unmatched employers ['b', 'c', 'd']

b proposes to C

C accepts the proposal

Tentative Pairings are as follows:

a 1 is paired with B 4

b 1 is paired with C 3

c is NOT paired

d is NOT paired

Unmatched employers ['c', 'd']

c proposes to D

D accepts the proposal

Tentative Pairings are as follows:

a 1 is paired with B 4

b 1 is paired with C 3

c 1 is paired with D 3

d is NOT paired

Unmatched employers ['d']

d proposes to C

C rejects the proposal

Tentative Pairings are as follows:

a 1 is paired with B 4

b 1 is paired with C 3

c 1 is paired with D 3

d is NOT paired

Unmatched employers ['d']

d proposes to B

B accepts the proposal

Tentative Pairings are as follows:

a is NOT paired

b 1 is paired with C 3
c 1 is paired with D 3
d 2 is paired with B 3
Unmatched employers ['a']
a proposes to A
A accepts the proposal
Tentative Pairings are as follows:
a 2 is paired with A 3
b 1 is paired with C 3
c 1 is paired with D 3
d 2 is paired with B 3
Final Pairings are as follows:
a 2 is paired with A 3
b 1 is paired with C 3
c 1 is paired with D 3
d 2 is paired with B 3
Sum of preferences for employers: 6
Sum of preferences for applicants: 12

Process finished with exit code 0

match2.py - The Applicants are now picking Employers

OUTPUT:

```
/home/rylei/Documents/CS5110/Project0/.venv/bin/python
/home/rylei/Documents/CS5110/Project0/match2.py
working with files ('Employers.txt', 'Applicants.txt', True)
Unmatched applicants ['A', 'B', 'C', 'D']
A proposes to d
d accepts the proposal
Tentative Pairings are as follows:
a is NOT paired
b is NOT paired
c is NOT paired
d 4 is paired with A 1
Unmatched applicants ['B', 'C', 'D']
B proposes to c
c accepts the proposal
Tentative Pairings are as follows:
a is NOT paired
b is NOT paired
c 4 is paired with B 1
d 4 is paired with A 1
Unmatched applicants ['C', 'D']
C proposes to a
a accepts the proposal
```

Tentative Pairings are as follows:

a 4 is paired with C 1

b is NOT paired

c 4 is paired with B 1

d 4 is paired with A 1

Unmatched applicants ['D']

D proposes to a

a accepts the proposal

Tentative Pairings are as follows:

a 3 is paired with D 1

b is NOT paired

c 4 is paired with B 1

d 4 is paired with A 1

Unmatched applicants ['C']

C proposes to c

c accepts the proposal

Tentative Pairings are as follows:

a 3 is paired with D 1

b is NOT paired

c 3 is paired with C 2

d 4 is paired with A 1

Unmatched applicants ['B']

B proposes to b

b accepts the proposal

Tentative Pairings are as follows:

a 3 is paired with D 1

b 2 is paired with B 2

c 3 is paired with C 2

d 4 is paired with A 1

Final Pairings are as follows:

a 3 is paired with D 1

b 2 is paired with B 2

c 3 is paired with C 2

d 4 is paired with A 1

Sum of preferences for employers: 12

Sum of preferences for applicants: 6

Process finished with exit code 0

match3.py - The Employers are picking but the Sums of Preferences are equal to the Applicants

OUTPUT:

/home/rylei/Documents/CS5110/Project0/.venv/bin/python

/home/rylei/Documents/CS5110/Project0/match3.py

working with files ('EmployersEX.txt', 'ApplicantsEX.txt', True)

Unmatched employers ['E', 'F', 'G', 'H']

E proposes to a
a accepts the proposal
Tentative Pairings are as follows:
E 1 is paired with a 1
F is NOT paired
G is NOT paired
H is NOT paired
Unmatched employers ['F', 'G', 'H']
F proposes to c
c accepts the proposal
Tentative Pairings are as follows:
E 1 is paired with a 1
F 1 is paired with c 1
G is NOT paired
H is NOT paired
Unmatched employers ['G', 'H']
G proposes to a
a rejects the proposal
Tentative Pairings are as follows:
E 1 is paired with a 1
F 1 is paired with c 1
G is NOT paired
H is NOT paired
Unmatched employers ['G', 'H']
G proposes to c
c rejects the proposal
Tentative Pairings are as follows:
E 1 is paired with a 1
F 1 is paired with c 1
G is NOT paired
H is NOT paired
Unmatched employers ['G', 'H']
G proposes to b
b accepts the proposal
Tentative Pairings are as follows:
E 1 is paired with a 1
F 1 is paired with c 1
G 3 is paired with b 3
H is NOT paired
Unmatched employers ['H']
H proposes to c
c rejects the proposal
Tentative Pairings are as follows:
E 1 is paired with a 1

F 1 is paired with c 1
G 3 is paired with b 3
H is NOT paired
Unmatched employers ['H']
H proposes to a
 a rejects the proposal
Tentative Pairings are as follows:
E 1 is paired with a 1
F 1 is paired with c 1
G 3 is paired with b 3
H is NOT paired
Unmatched employers ['H']
H proposes to d
 d accepts the proposal
Tentative Pairings are as follows:
E 1 is paired with a 1
F 1 is paired with c 1
G 3 is paired with b 3
H 3 is paired with d 3
Final Pairings are as follows:
E 1 is paired with a 1
F 1 is paired with c 1
G 3 is paired with b 3
H 3 is paired with d 3
Sum of preferences for employers: 8
Sum of preferences for applicants: 8

Process finished with exit code 0

match4.py - The Applicants are picking but the Sums of Preferences are equal to the Employers
OUTPUT:

```
/home/rylei/Documents/CS5110/Project0/.venv/bin/python
/home/rylei/Documents/CS5110/Project0/match4.py
working with files ('EmployersEX.txt', 'ApplicantsEX.txt', True)
Unmatched applicants ['a', 'b', 'c', 'd']
a proposes to E
    E accepts the proposal
Tentative Pairings are as follows:
E 1 is paired with a 1
F is NOT paired
G is NOT paired
H is NOT paired
Unmatched applicants ['b', 'c', 'd']
b proposes to E
    E rejects the proposal
```

Tentative Pairings are as follows:

E 1 is paired with a 1

F is NOT paired

G is NOT paired

H is NOT paired

Unmatched applicants ['b', 'c', 'd']

b proposes to F

F accepts the proposal

Tentative Pairings are as follows:

E 1 is paired with a 1

F 2 is paired with b 2

G is NOT paired

H is NOT paired

Unmatched applicants ['c', 'd']

c proposes to F

F accepts the proposal

Tentative Pairings are as follows:

E 1 is paired with a 1

F 1 is paired with c 1

G is NOT paired

H is NOT paired

Unmatched applicants ['d', 'b']

d proposes to G

G accepts the proposal

Tentative Pairings are as follows:

E 1 is paired with a 1

F 1 is paired with c 1

G 4 is paired with d 1

H is NOT paired

Unmatched applicants ['b']

b proposes to G

G accepts the proposal

Tentative Pairings are as follows:

E 1 is paired with a 1

F 1 is paired with c 1

G 3 is paired with b 3

H is NOT paired

Unmatched applicants ['d']

d proposes to E

E rejects the proposal

Tentative Pairings are as follows:

E 1 is paired with a 1

F 1 is paired with c 1

G 3 is paired with b 3

H is NOT paired

Unmatched applicants ['d']

d proposes to H

H accepts the proposal

Tentative Pairings are as follows:

E 1 is paired with a 1

F 1 is paired with c 1

G 3 is paired with b 3

H 3 is paired with d 3

Final Pairings are as follows:

E 1 is paired with a 1

F 1 is paired with c 1

G 3 is paired with b 3

H 3 is paired with d 3

Sum of preferences for employers: 8

Sum of preferences for applicants: 8

Process finished with exit code 0