Lecture 7

CSE 331

HW 1 is out!

note @46

Homework 1 is Online

Homework 1 is online at https://cse.buffalo.edu/~nasrinak/cse331/SP23/hws/hw1/index.html.

You can also access the homework from the "Homework" drop-down menu in the navigation bar of the course webpage.

Homework 1 is due Friday, February 17, 8:00pm.

hw1

HW0 Grades Released

note @66 stop following 71 views

Actions

HW0 Grades Released

HW0 has been graded. The scores and the feedback are now available on Autolab.

Here are the stats (note that the stats are only over the students who submitted and not the entire class):

Q1(a):

Problem	Mean	Median	StdDev	Max	Min
Proof Idea	4.5	2.3	3.9	10.0	0.0

1st t/f Poll

poll @72

stop following **8 views**

Actions

First T/F Poll

Apologies for getting this started late! The plan is to do a weekly True/false question on piazza. The way it is going to work is that (almost) every Monday (or so) I will post a statement in a poll and ask you all to vote True or False. (Please just vote and do not post your justification yet.) Then after two days, I will give the correct answer, and then I'll ask you to construct the correct justification. Note that this is to give you more practice for the true/false questions on the exams (there will be pretty much no true/false questions on the homeworks). So please try and work on these on your own so that you gain some practice.

Here is the first question. Is the following statement **True** or **False**?

Given n numbers $a_1, \ldots, a_n$ such that for every $i \in [n]$ (we will use $[n]$ to denote the set of integers $\{1, \ldots, n\}$) we have $a_i \in \{0, 1\}$. That is, we are given n numbers each of which is a bit. Then we can sort these n numbers in $O(n)$ time.

First T/F Poll closes in 7 day(s)

A total of 4 voter(s) in 0 hours

3 votes (75%) True

1 vote (25%) False

Register your project groups

Deadline: Friday, March 3, 11:59pm

CSE 331 Syllabus Piazza Schedule Homeworks ▾ Autolab Project ▾ Support Pages ▾

Project Overview

Group signup form

CSE 331 Project

Spring 2023

Details and motivations for the project.

Motivation

CSE 331 is primarily concerned with the technical aspects of algorithms: how to design them and then how to analyze their correctness and runtime. However, algorithms are pervasive in our world and are common place in many aspects of society. The main aim of the project is to have you explore in some depth some of the social implications of algorithms.

Just to give some examples for such implications:

Your UB email: XXX@buffalo.edu

Your UBIT ID is XXX

NOT XXX @buffalo.edu
NOT your person number

Gale-Shapley Algorithm

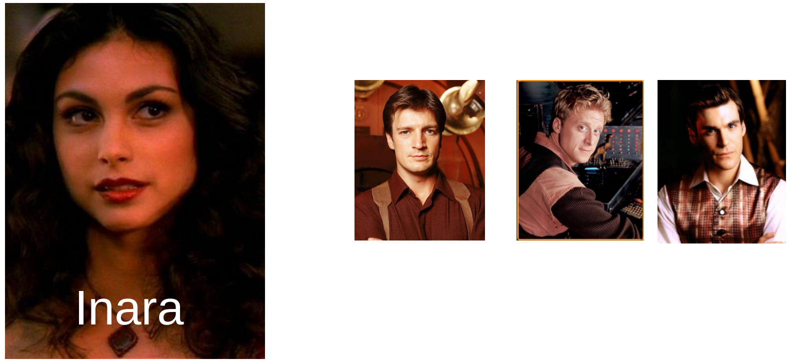
Intially all men and women are free

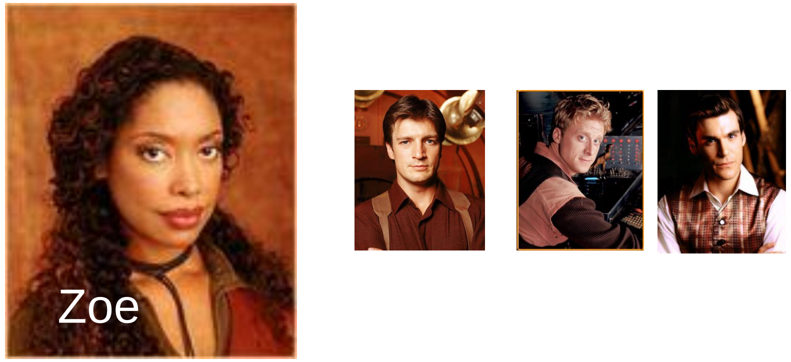
While there exists a free woman who can propose

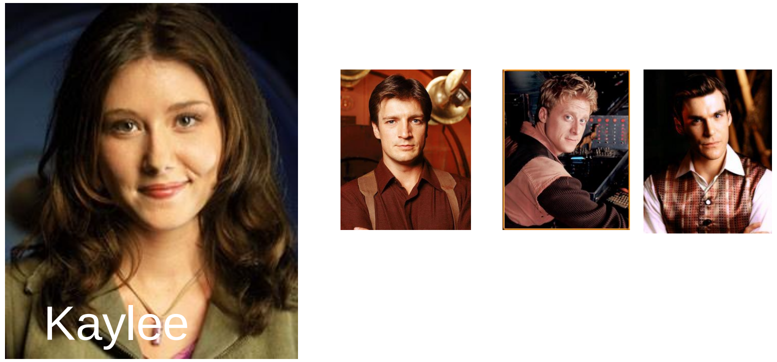
> Let w be such a woman and m be the best man she has not proposed to
>
> w proposes to m
>
> If m is free
>
> (m,w) get engaged
>
> Else (m,w’) are engaged
>
> If m prefers w’ to w
>
> w remains free
>
> Else
>
> (m,w) get engaged and w’ is free

Output the engaged pairs as the final output

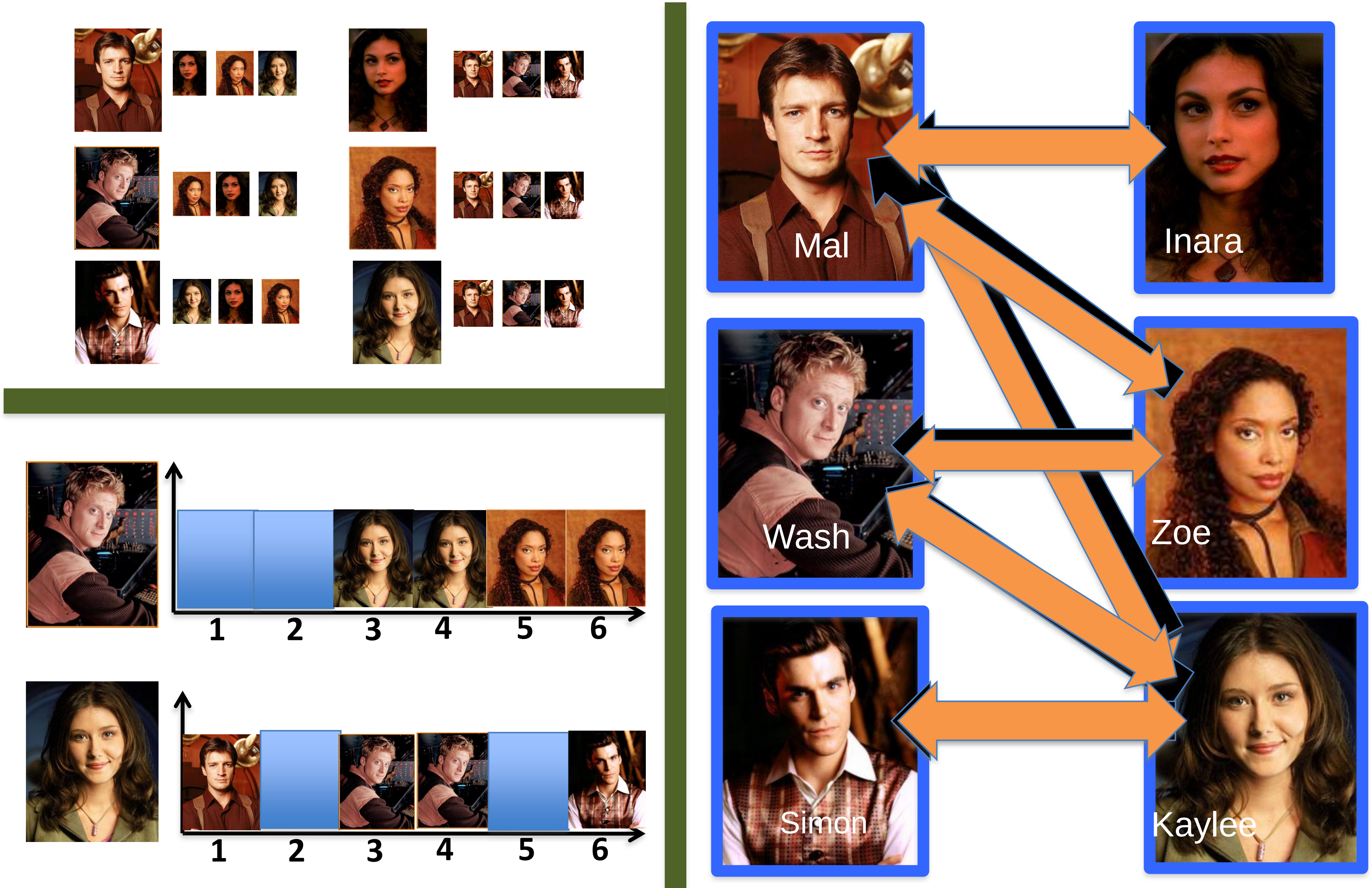
Preferences







GS algorithm: Firefly Edition



Observation 1

Intially all men and women are free

While there exists a free woman who can propose

Let w be such a woman and m be the best man she has not proposed to

w proposes to m

If m is free

(m,w) get engaged

Else (m,w') are engaged

If m prefers w' to w

w remains free

Else

(m,w) get engaged and w' is free

Once a man gets engaged, he remains engaged (to "better" women)

Output the engaged pairs as the final output

Observation 2

Intially all men and women are free

While there exists a free woman who can propose

Let w be such a woman and m be the best man she has not proposed to

w proposes to m

If m is free

(m,w) get engaged

Else (m,w’) are engaged

If m prefers w’ to w

w remains free

Else

(m,w) get engaged and w’ is free

If w proposes to m after m’, then she prefers m’ to m

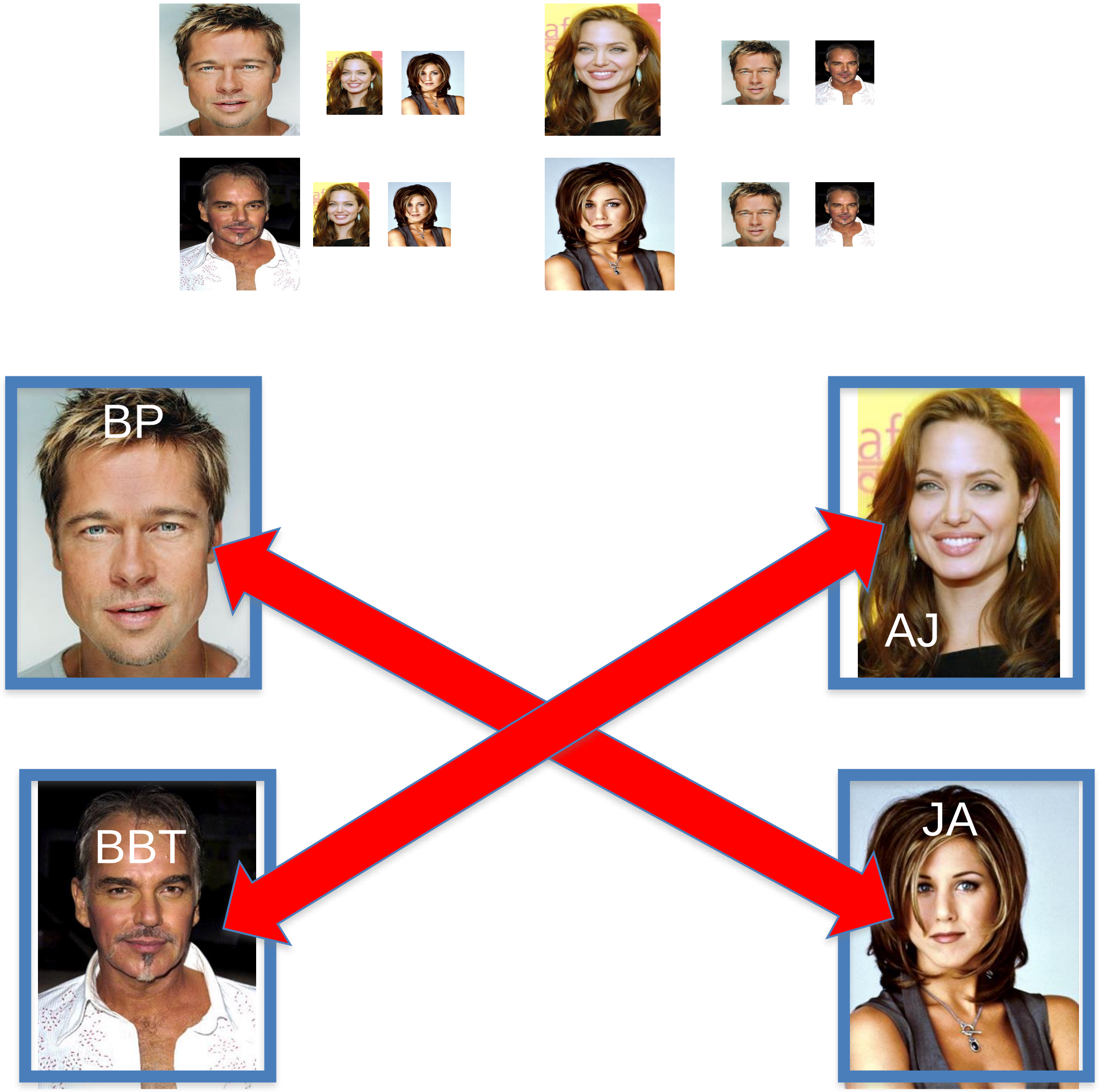
Output the set S of engaged pairs as the final output

Why bother proving correctness?

Consider a variant where any free man **or** free woman can propose

Is this variant any different? Can you prove it?

GS’ does not output a stable marriage



Rest of today’s agenda

GS algorithm

Run of GS algorithm on an instance

Prove correctness of the GS algorithm