Lecture 4

CSE 331

Please have a face mask on

Masking requirement

UB requires all students, employees and visitors – regardless of their vaccination status – to wear face coverings while inside campus buildings.

https://www.buffalo.edu/coronavirus/health-and-safety/health-safety-guidelines.html

Office hours finalized

note @46 stop following 87 views

TA Office Hour Schedule

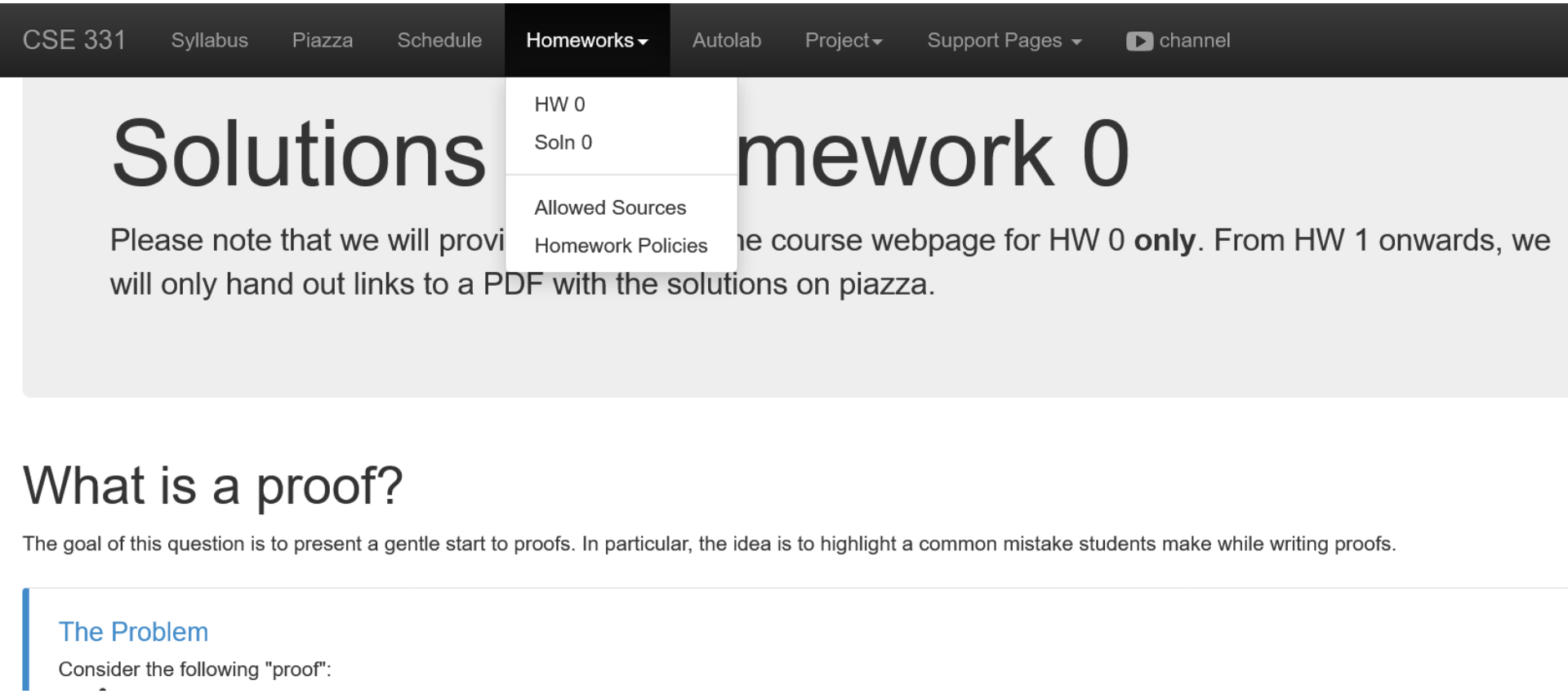
Hello everybody,

We have finalized TA office hours. An (i) after a TA name means an *in-person* office hour and a (v) after a TA name means that the office hour is virtual-only on zoom.

All in-person TA office hours that do not mention a specific location in the list below will be in Salvador lounge. Locations may change in the third week. Please keep an eye on this post and check this post to know the correct location before you come to a TA office hour.

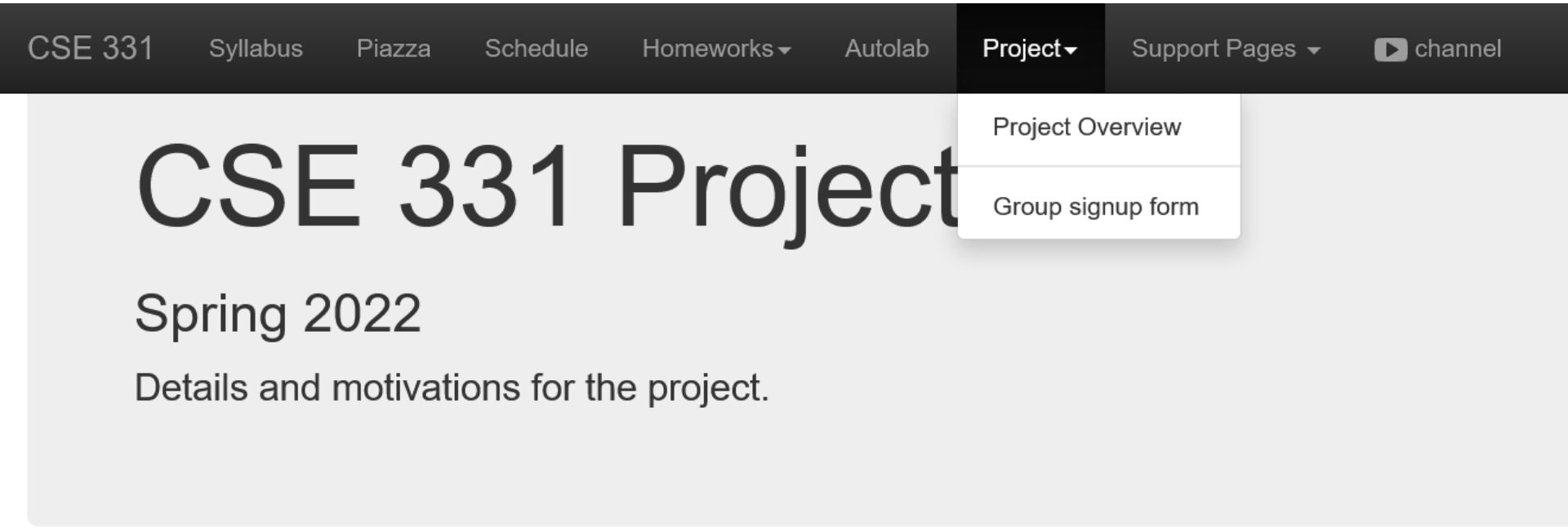
- Mondays
  - 11:00am-12:00pm: Prathamesh (i), Asif (v)
  - 12:00-1:00pm: Michael (i)
  - 1:00-3:00pm: Snigdha (v)
  - 5:00-7:00pm: Megan (i)
- Tuesdays
  - 11:00am-12:00pm: Joseph (i)

Solutions to HW 0 out



Register your project groups

Deadline: Friday, March 4, 11:59pm



Motivation

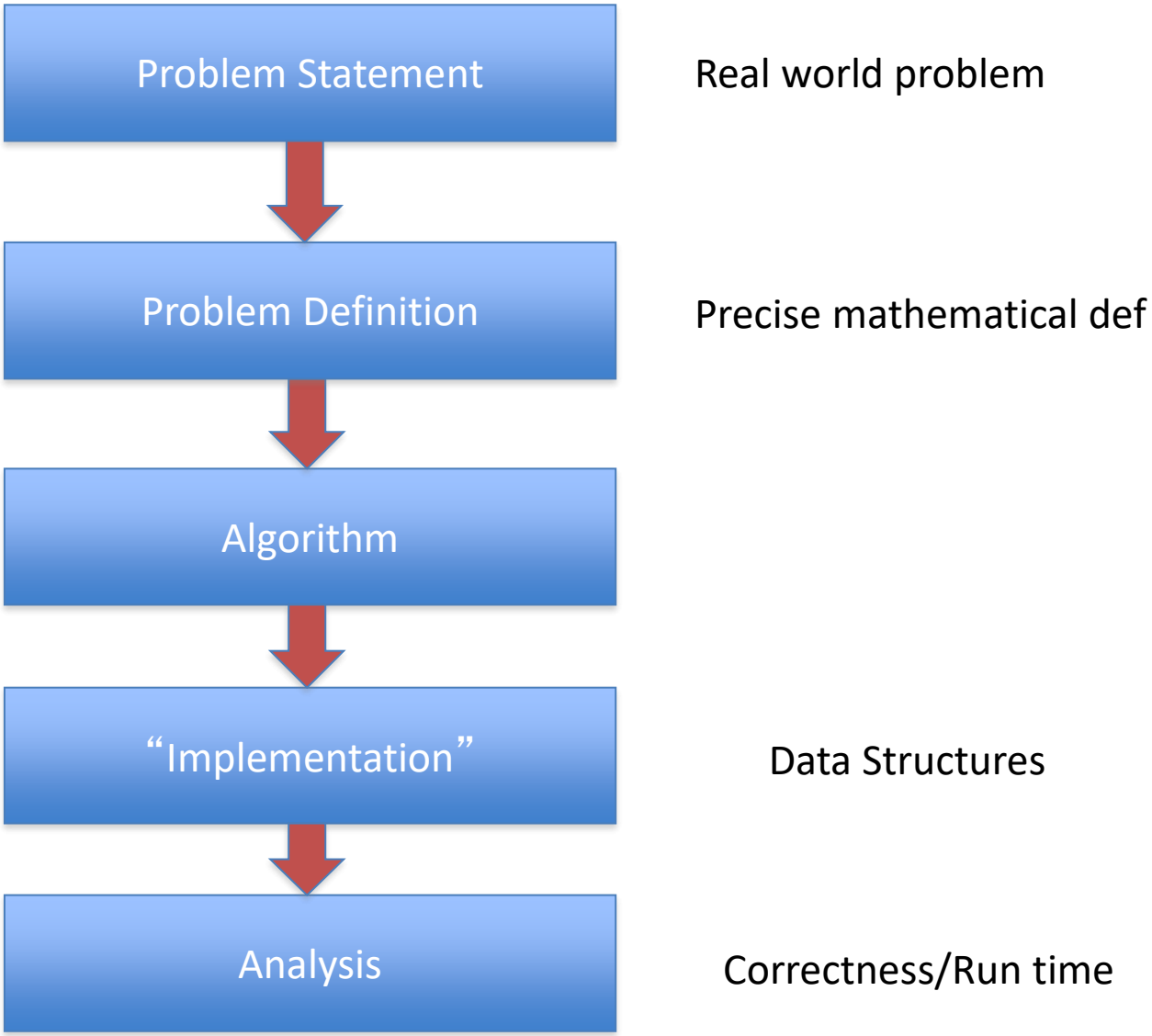
CSE 331 is primarily concerned with the technical aspects of algorithms: how to design them and then how to analyze their correctness and in our world and is common place in many aspects of society. The main aim of the project is to have you explore in some depth some of the

Just to give some examples for such implications:

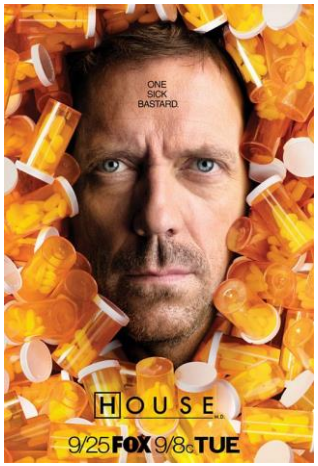
- Big data is hot these days and there is a (not uncommon) belief that by running (mainly machine learning) algorithms on big data, we potentially make policy decisions. Here is a cautionary talk:

Questions/Comments?

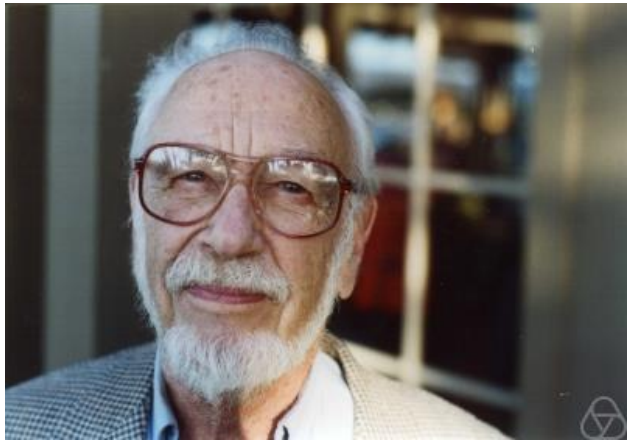
Main Steps in Algorithm Design



NRMP plays matchmaker



Stable Matching Problem



David Gale

Lloyd Shapley

Matching Employers & Applicants

Input: Set of employers (E)
Set of applicants (A)
Preferences

Output: An assignment of applicants to employers that is "stable"

For every x in A and y in E such that x is **not** assigned to y, either

(i) y prefers *every* accepted applicant to x; or

(ii) x prefers her employer to y

Questions to think about

1) How do we specify preferences? Preference lists

2) Ratio of applicant vs employers 1:1

3) Formally what is an assignment? (perfect) matching

4) Can an employer get assigned > 1 applicant? NO

5) Can an applicant have > 1 job? NO

6) How many employer/applicants in an applicants/employers preferences? All of them

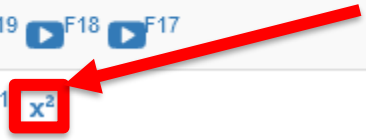
7) Can an employer have 0 assigned applicants? NO

8) Can an applicant have 0 jobs? NO

Lost in Notation….

CSE 331 Spring 2022 Schedule

Date	Topic	Notes
Week 1 Mon, Jan 31	Introduction F21 F19 F18 F17	Week 1 recitation notes (**HW 0 out**)
Wed, Feb 2	Main Steps in Algorithm Design F21 F19 F18 F17	
Fri, Feb 4	Stable Matching Problem F21 F19 F18 F1 x^2	[KT, Sec 1.1]



Stable Marriage Problem

n men

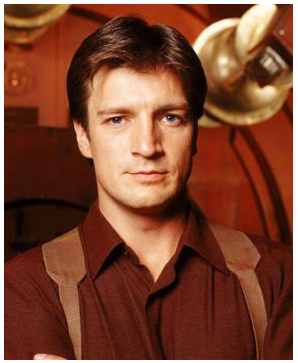
n women

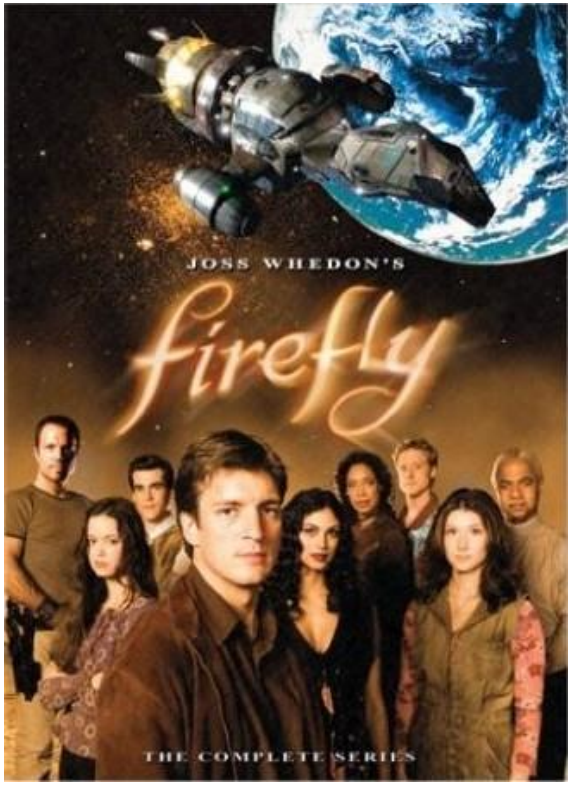
Each with a preference list

Match/marry them in a “stable” way

On matchings

Mal



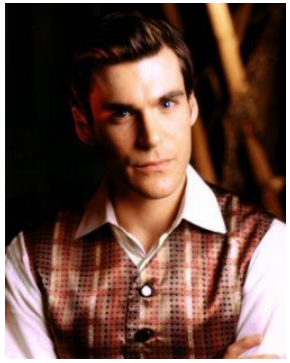


Inara

Wash

Zoe

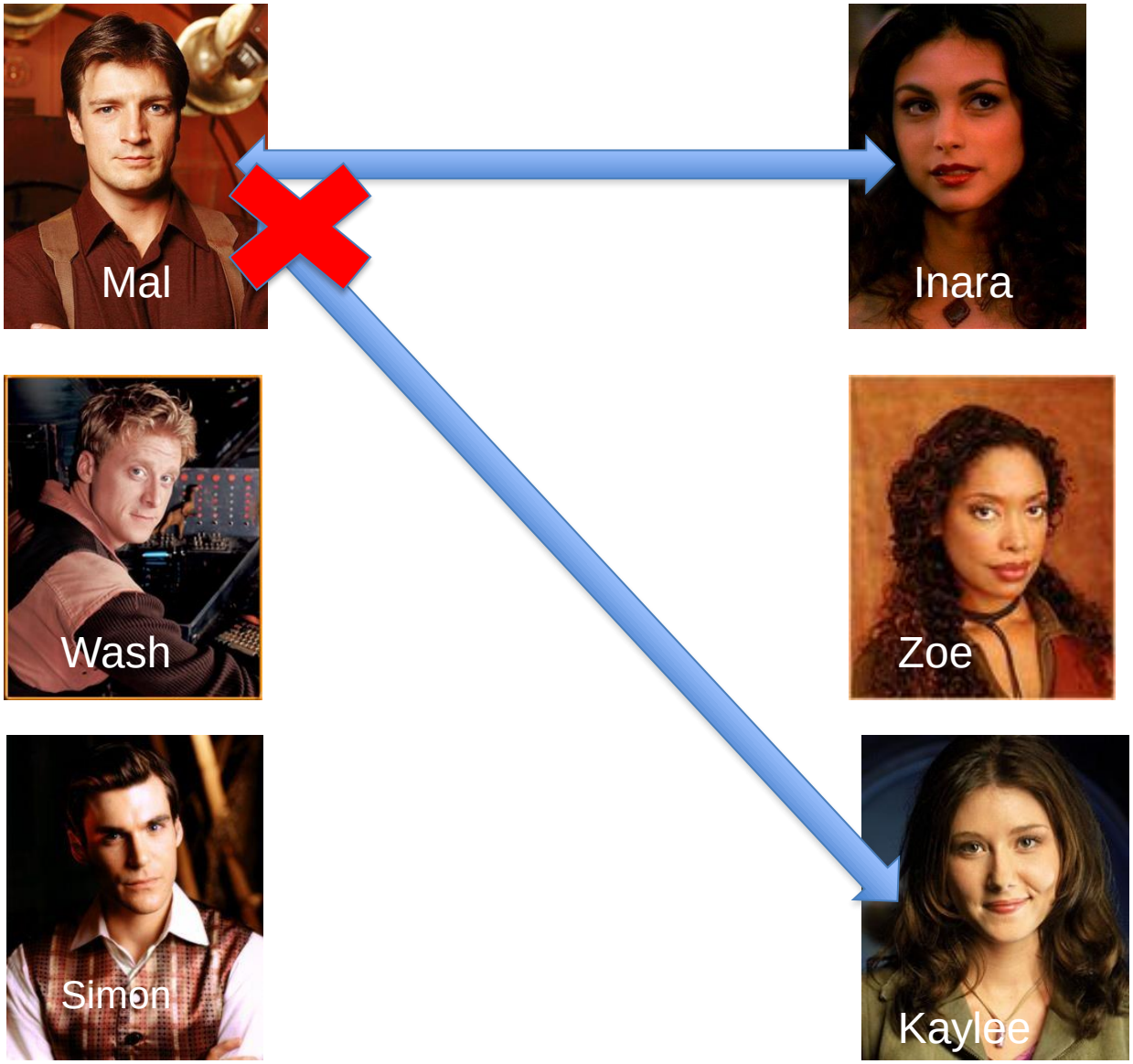
Simon



Kaylee

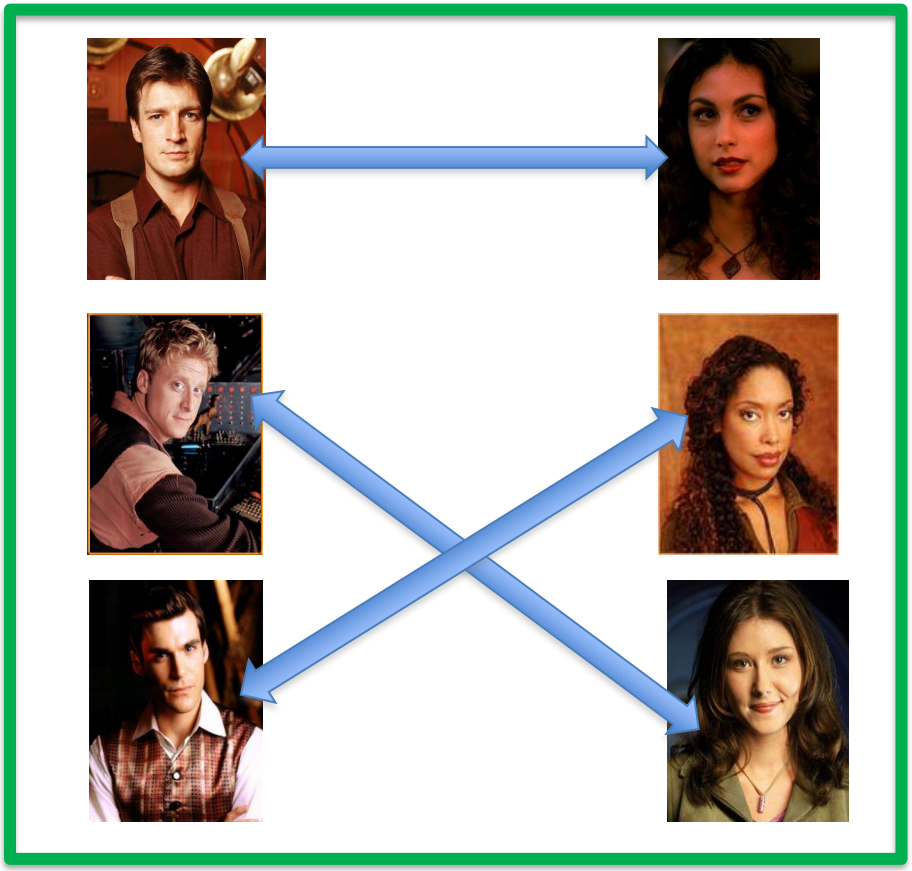
Is this a valid matching?

Is this a valid matching?



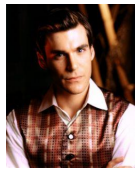
Is this a valid matching?

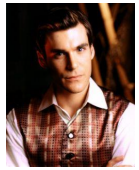
Which one is a perfect matching?

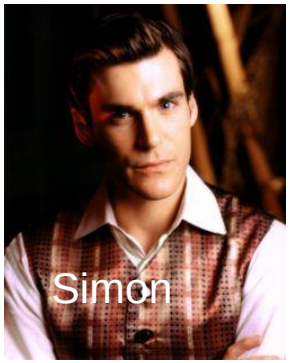


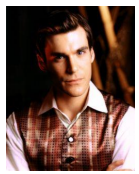
Work things out on paper

Preferences

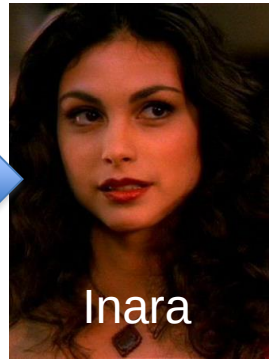


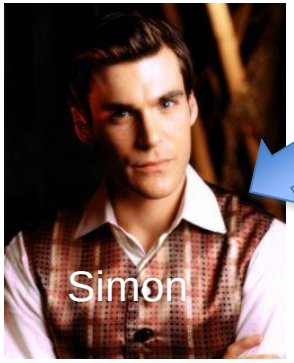


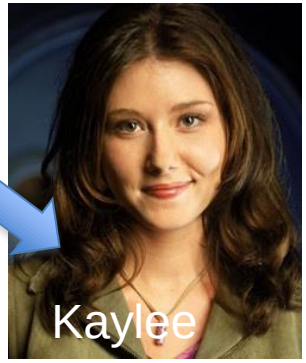




Instability







Work things out on paper