

Lecture 2

CSE 331

Aug 31, 2016

Enroll on Piazza

The screenshot shows the Piazza interface for the course "CSE 331: Introduction to Algorithm Analysis and Design" at the University at Buffalo, Fall 2016. The page is organized into several sections:

- Header:** Includes the Piazza logo, course name "CSE 331", navigation links for "Q & A", "Resources", "Statistics", and "Manage Class", and a user profile for "Art Kudva".
- Course Title:** "CSE 331: Introduction to Algorithm Analysis and Design" with a sub-header "University at Buffalo - Fall 2016".
- Buttons:** A prominent "+ Add Syllabus" button is located below the course title. A lock icon is visible on the right side.
- Navigation:** Tabs for "Course Information", "Staff", and "Resources" are present.
- Description Section:** Labeled "Description" with an "Edit" button. It contains a yellow box with the text: "Add a Class Description. Click the Edit button to add a class description."
- General Information Section:** Labeled "General Information" with an "Edit" button. It includes the heading "Class webpage" and the text: "All information here: <http://www-student.cse.buffalo.edu/~atrivedi331/fall16/>".
- Announcements Section:** Labeled "Announcements" with an "Add" button. It features a post titled "Welcome to CSE 331!" with "Edit" and "Delete" buttons. The post content includes:
 - Timestamp: 8/18/15 11:00 AM
 - Text: "Welcome to the Fall 2016 edition of CSE 331. It'll be a fun course and I'm looking forward to it."
 - Text: "Please use the Q&A portion of Piazza to ask questions. In fact, unless your query is personal, we will not answer the question unless it is posted on Piazza."
 - Text: "Pretty much everything that you need to know about the course can be found on the [CSE 331 webpage](#)."
 - Text: "In particular, I will draw your attention to the [syllabus](#), [HW policies](#) and the [support pages](#). Happy Reading!"
 - Text: "View on Piazza"

<https://piazza.com/buffalo/fall2016/cse331/>

Read the syllabus CAREFULLY!

CSE 331

Introduction to Algorithm Analysis and Design

Fall 2016

University at Buffalo

Department of Computer Science & Engineering

CSE 331 — Introduction to Algorithm Analysis and Design

I' ll need confirmation in writing. No graded material will be handed back till I get this signed form from you!

I, _____ (PRINT name), acknowledge that I have read and understood the syllabus (and the homework policy document) for this course, CSE 331 *Introduction to Algorithm Analysis and Design*.

I also acknowledge that I understand the definition of academic integrity as outlined in the syllabus, and that I will minimally receive a grade of F in the course if I am found to have breached academic integrity, *even if it occurs for the first time*. In particular, I understand that I cannot claim that I did not understand the rules if I am found to have breached academic integrity.

Signature: _____

Date: _____

Autolab is up and working

Autolab

Details on Autolab, which will be used for all homework submissions in CSE 331.

Thanks to [Jaric Zola](#) for allowing us to adapt his Autolab user documentation.

Under Construction

We are still doing some final tweaks to Autolab. We expect to have a functional version up by Wednesday, August 31, 2016. In the meantime, thanks for your patience!

The main link

We will be using the UB CSE extension to Autolab for submission and (auto)grading of CSE 331 homeworks. You can access Autolab via <https://autograder.cse.buffalo.edu/>.

You can submit HW 0 now

AUTOØLAB

🏠 » CSE 331: Introduction to Algorithm Design (f16)

Instructor Actions

Install Assessment

Assignments

Homework 0

Q1 (Sorting programming question)

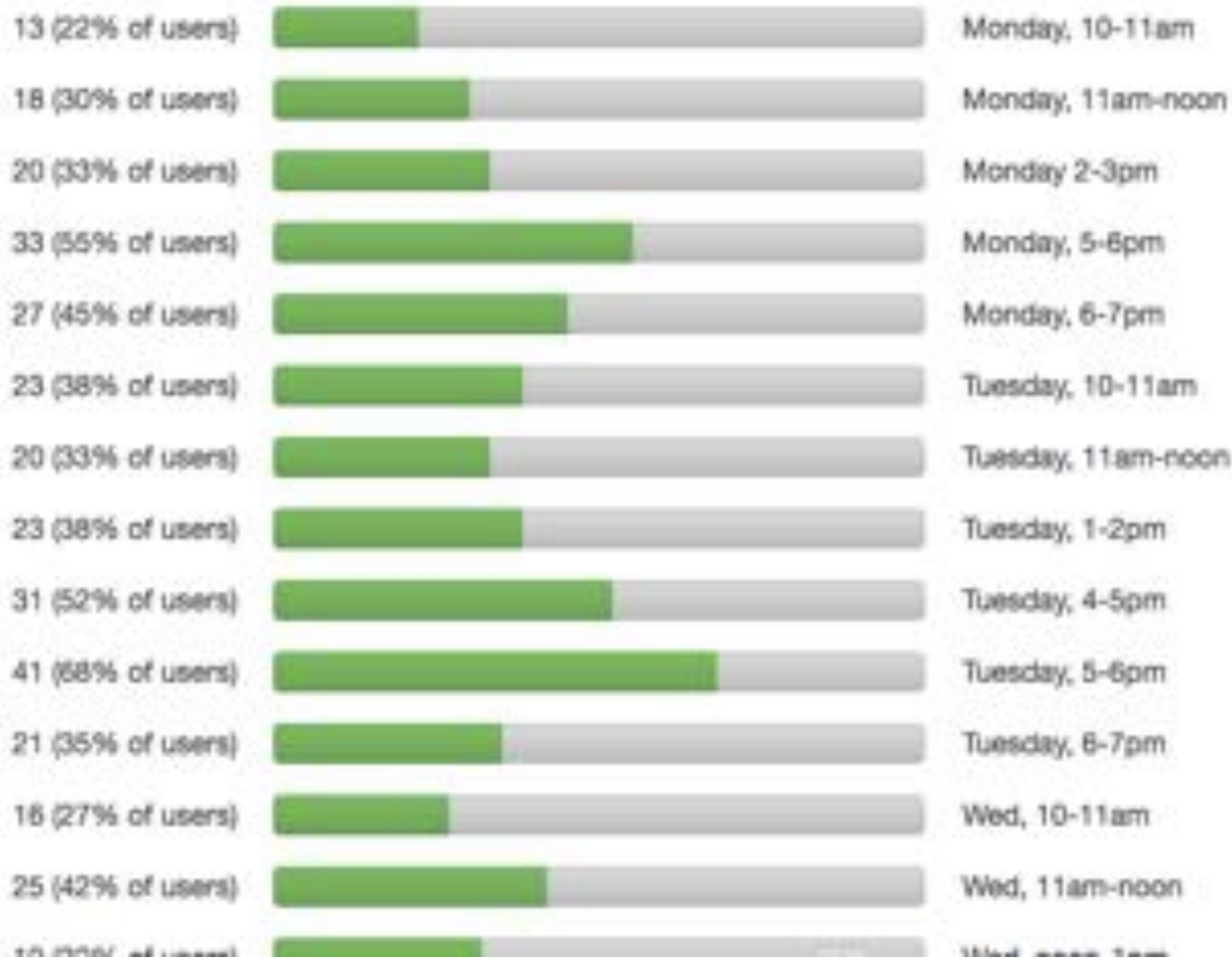
Q2 (Induction)



TA Office hours finalized today

Vote for TA office hours closes in 5 day(s)

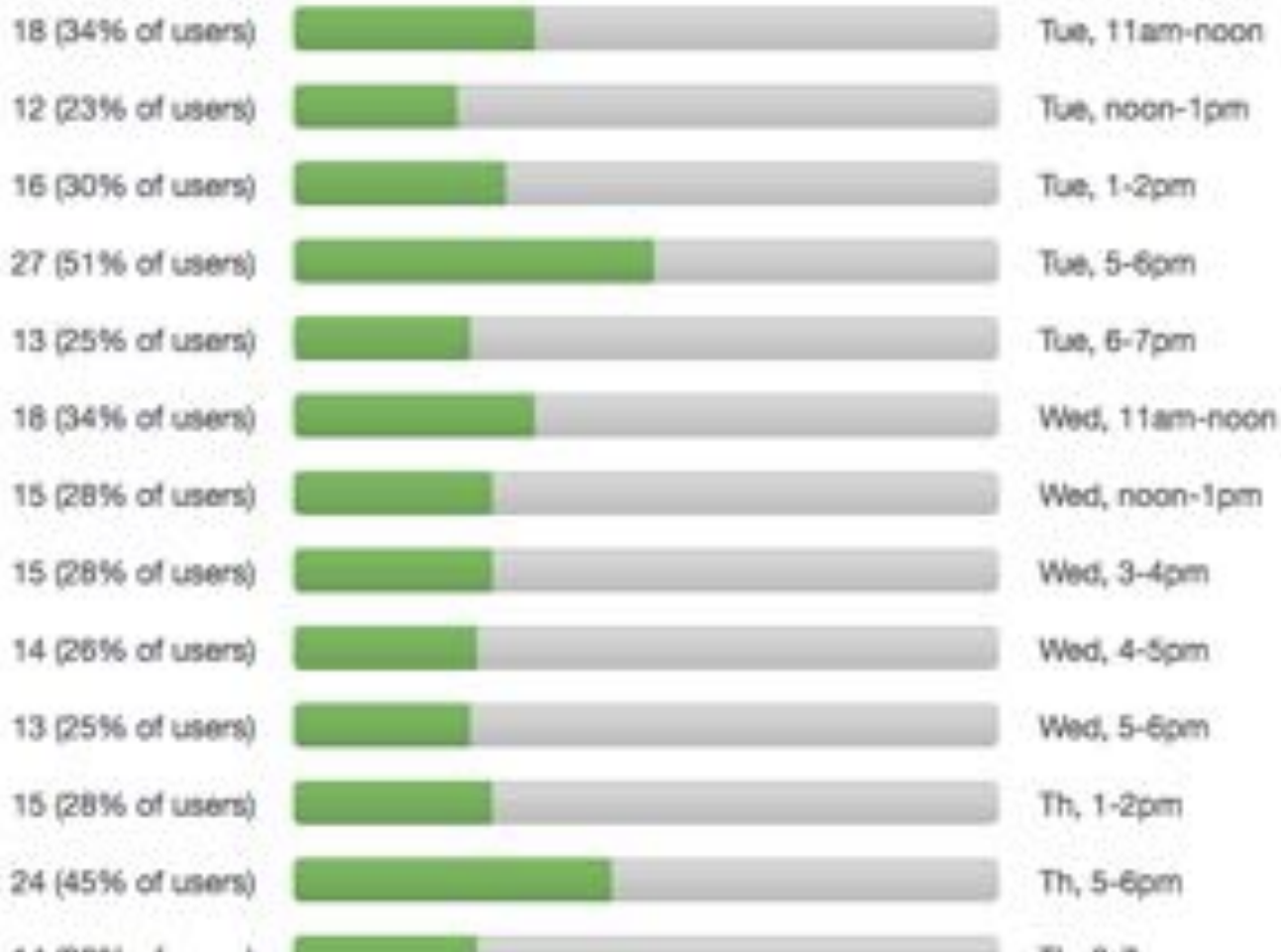
A total of 60 vote(s) in 30 hours



As well as makeup Mon recitations

Vote for alternate recitations for week 2 closes in 5 day(s)

A total of 53 vote(s) in 30 hours



Questions/Comments?



Let the fun begin!



Who is Algorithm named after?

Abū ‘Abd Allāh Muhammad ibn Mūsā al-Khwārizmī

9th century Persian astronomer/mathematician

825 AD: “On Calculation with Arabic Numerals”



Latin translation 12th century

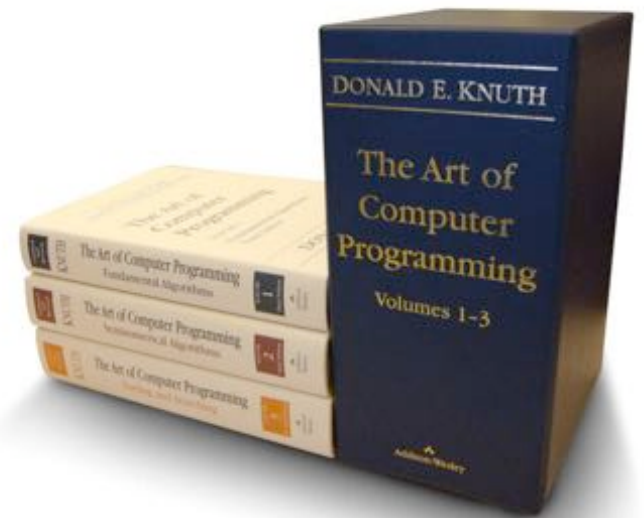
“Algorithmi de numero Indorum”



What are Algorithms?



Don Knuth




Don Knuth Reward Checks

 DONALD E. KNUTH
COMPUTER SCIENCE DEPARTMENT
STANFORD UNIVERSITY
STANFORD, CA 94305-9043

432

DATE 29 Oct 2008

DEPOSIT TO THE ACCOUNT OF Tony Lu 0x\$ 1.00

One and  100/256 HEXADECIMAL DOLLARS 

 BANK OF SAN SERRIFFE
Thirty Points, Calissa Inferioris
<http://www-cs-faculty.stanford.edu/~knuth/boss.html>

MEMO f2b.135 Donald Knuth

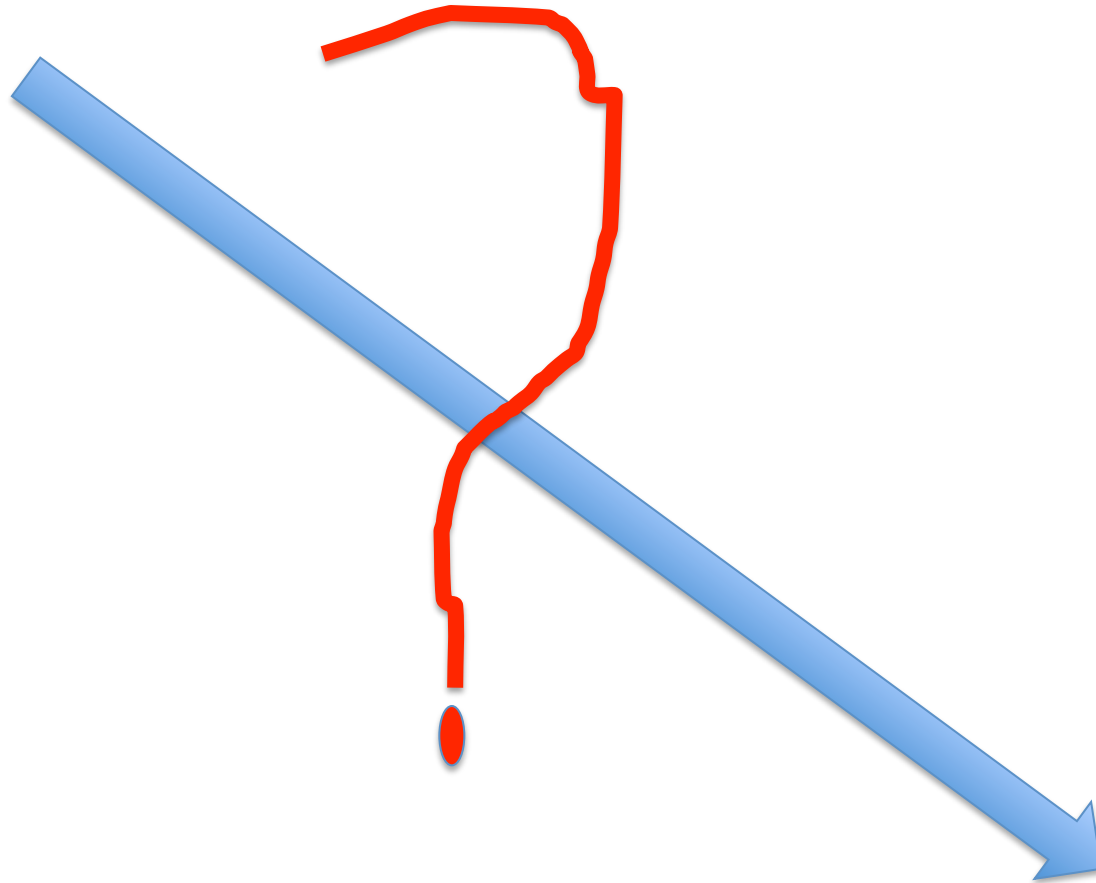
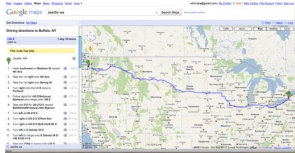
Knuth's Definition

An algorithm is a finite, definitive, effective procedure with some input and some output

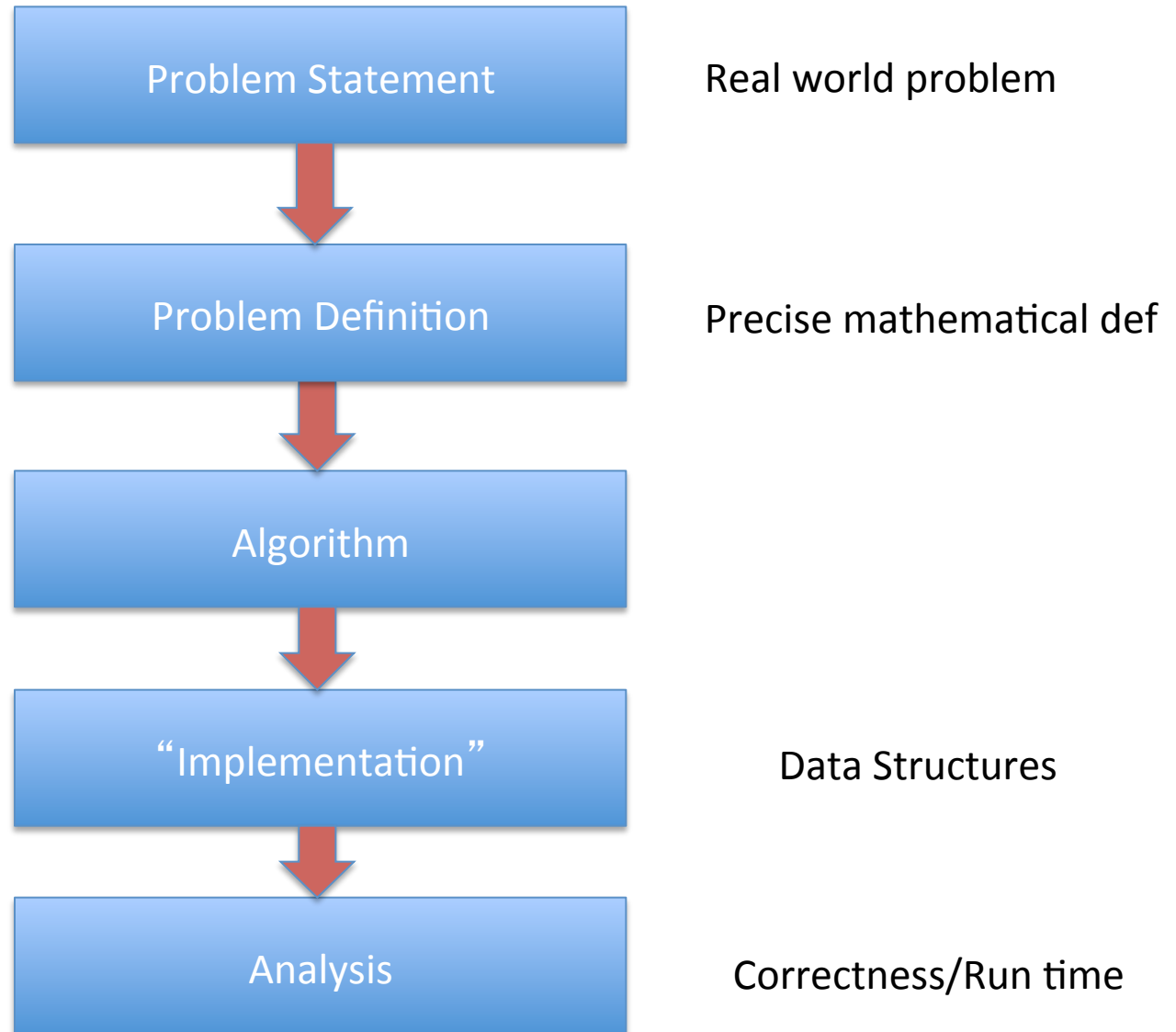
Remember: Stick with your group



From problem to software



Main Steps in Algorithm Design



Worst-case analysis

Correctness should hold for every valid input



Why worst-case?

Resource usage by the worst-possible input



What
resources?

Questions/Comments?



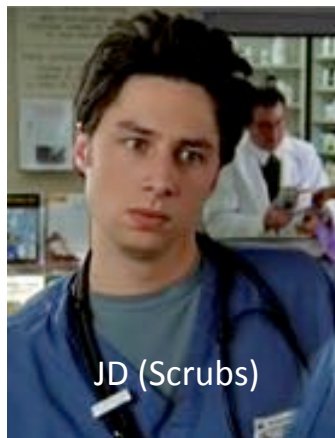
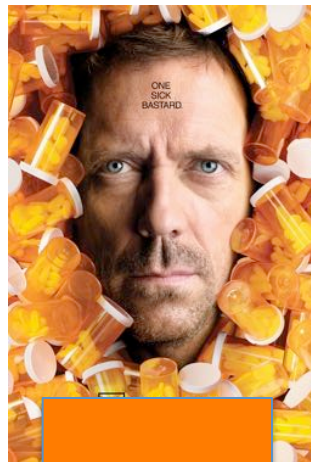
National Resident Matching

The screenshot shows the homepage of the National Resident Matching Program (NRMP). At the top left is the logo for "THE MATCH NATIONAL RESIDENT MATCHING PROGRAM". To the right of the logo is a navigation menu with links for "ABOUT", "NEWS & ANNOUNCEMENTS", "THE MATCH, A TO Z", and "CONTACT US". A search bar with the placeholder text "KEYWORD" and a magnifying glass icon is located below the navigation menu. Further down, there are links for "RESIDENCY", "FELLOWSHIP", "HOW A MATCH WORKS", "POLICIES", and "MATCH DATA".

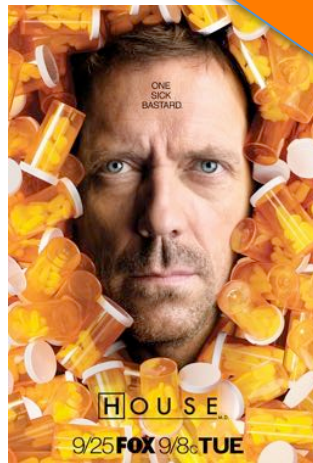
The main content area features a large graphic on the left showing a hand holding a megaphone with the text "IMPORTANT ANNOUNCEMENT" written on a chalkboard. Below this graphic is a button that says ">> Review". To the right of this graphic is a vertical stack of three buttons: "START HERE" (blue), "RESIDENCY OVERVIEW" (teal), and "FELLOWSHIP OVERVIEW" (dark teal). To the right of these buttons are three smaller buttons: "REGISTER /LOGIN FOR A MATCH" (orange), "REGISTER /LOGIN HELP" (blue), and "EMAIL THIS PAGE" (blue with an envelope icon).

Below the main content area, there is a paragraph of text: "The Match provides unparalleled medical matching services in the United States. It's 100% objective, 100% accurate, and 100% committed to a fair and transparent process. With its internationally recognized algorithm, comprehensive data reports, and advanced technology, The Match is helping applicants achieve their dreams." Below this paragraph is the text "Getting it right since 1952."

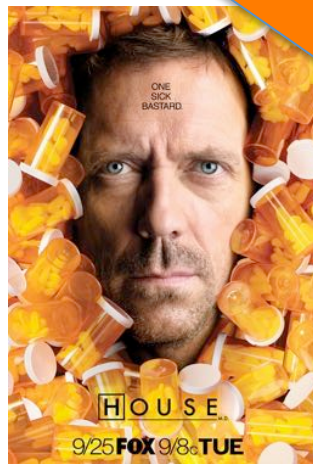
(Screen) Docs are coming to BUF



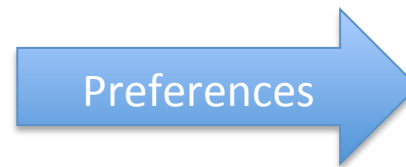
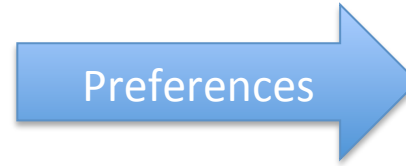
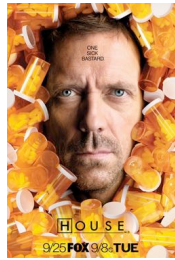
What can go wrong?



The situation is unstable!



What happens in real life



NRMP plays matchmaker



Stable Matching Problem



David Gale



Lloyd Shapley