

# STABLE MARRIAGE, WELL ORDERING PRINCIPLE, OPTIMALITY, GRAPHS

---

## META

January 31 to February 3, 2017

---

### 1 General Comments

---

1. Logistics:
  - (a) Mentors who have section Monday will not have section the first week. They can either try to reschedule their section for later in the week, or their students can sign up for a different section on the spreadsheet on Scheduler
  - (b) Book rooms!
  - (c) Dont forget to take attendance during section!
  - (d) Tell your students to check Piazza for worksheets! (Ill add you soon)
2. Start off class with checking to see if they have any questions but dont spend more than about 20 minutes on this, but do make sure they get induction!
3. If students have any questions about Worksheet 0 (so make sure and review this first!)
  - (a) Work on Fibonnacci question iff they were very comfortable with induction from worksheet 0 - if not, spend some more time on induction because its very important.
4. A lot of the stable marriage is filling in proofs: For this reason, its important to lecture on this stuff specifically. A lot of the students dont read the notes and this is straight from the notes

---

## 2 Questions

---

### 2.1 Stable Marriage

---

#### 1. You Can't Please Everyone

- This is hard. Make sure to understand how the recursive argument works
- Explanation of case 2: start with 2 men and 2 women and show that it cant work unless there is a third man and women; then show that that cant work unless theres a 4th man and woman. Note that this continues ad infinitum, but cant since there are a finite number of men and women.

### 2.2 Well Ordering Principle

---

#### 1. Well Ordering Principle

- Induct on the number  $x$ :  $x$  is a natural number, counting from 0 to  $\infty$
- If  $x$  is in the set, either  $x$  is the smallest element or there is some other element that is smaller