

# CSCI111: Intro to Software Development

**Welcome, Logistics, and Programming**

Prof. Pablo Frank  
AKA “Pablo”

# Logistics: Materials

- Webpage
  - Linked to from my(Pablo's) webpage (<https://pfrank.seas.gwu.edu/>)
- Forum: Piazza
  - see signup information on course webpage
  - Post questions here, not email...unless HW specific
  - Anonymous posts possible
- Book: ZyBook: Zyante online text book
  - See signup information on Piazza
- Homework submissions: blackboard
  - my.gwu.edu link on the left

# TODO and homework

- Piazza
- ZyBook
- Survey
- Homework!

# Logistics: Course + Labs

- Course
  - Some lecture
  - Lots of in-class work
- Labs
  - Guided programming practice
  - Labs in Tompkins and SEH
- Laptops?
  - Bring to class
  - Bring to lab

# Grading

- Attendance is mandatory
  - Random 5-minute quiz at start of random lectures.
  - 5-minute quiz at start of random labs.
  - Quiz completion will be used as attendance.
  - Tardiness is not tolerated.
- Participation is mandatory
  - Programming in class + lab, and discussion.
- Homework
  - Textbook activities
  - Programming assignments
  - Readings
- Final

# Academic Honesty

- Do your own work
  - Google does not count
  - Other students do not count
  - Absolutely NO COPY-PASTE
- Please discuss course topics
  - ...but don't share homeworks
- Some group work
  - Do the work only with those in your group
  - Share the work
  - Report collaborations!

# You Right Now



# Wake-up Activity

- We're going to “compute” something using the people in the room as the computer. So

**Wake Up and Get Ready to  
Think and Move.**

Don't worry, there will be no talking involved.



# Problem with Constraints:

**Objective:** Find every group of people with the same birthday.

**Constraint:** You cannot speak, write or use a keyboard... you have to gesture with ONE HAND!

Individually: Think about 3 different methods, even if they are brute-force or naive.

[1 minute]

# “Computing” Same-Birthday-Groups (using a single hand to communicate)

- **First:** How many of you think there will be at least two people with the same birthday in this group?
  - More on this later
- **Now:** What ideas did you come up with?

# “Computing” Same-Birthday-Groups (using a single hand to communicate)

- **Brute-Force:** One person counts each day of the year; lift hands when your day is shown and make groups. (~365 “inquiries”)
- **Naive:** Let each person “gesture” their birthday and make groups with those that match. (~80 “inquiries”)
- **Our “Distributed approach”:**
  - We'll follow a series of simple steps and then we'll figure out if it's better or worse.

# “Computing” Same-Birthday-Groups (using a single hand to communicate)

The Distributed approach:

**Everyone gestures and looks around to:**

- 1) Merge by month (using ASL 1-12)
- 2) If alone, sit down
- 3) Merge by Day-sets (0, 1, 2, 3)
- 4) If alone, sit down
- 5) Merge by day (using ASL 0-9)
- 6) If alone, sit down
- 7) Each group reports its count.

# “Computing” Same-Birthday-Groups (using a single hand to communicate)

1) We'll use (simplified) ASL



1

2

3

4

5



6

7

8

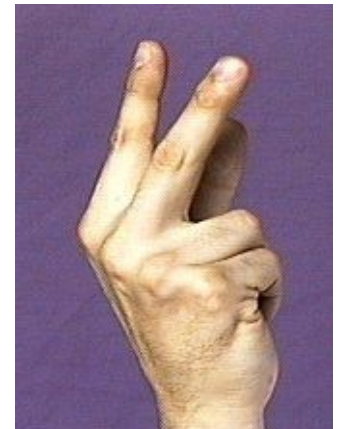
9

10

Notice the thumb!



11



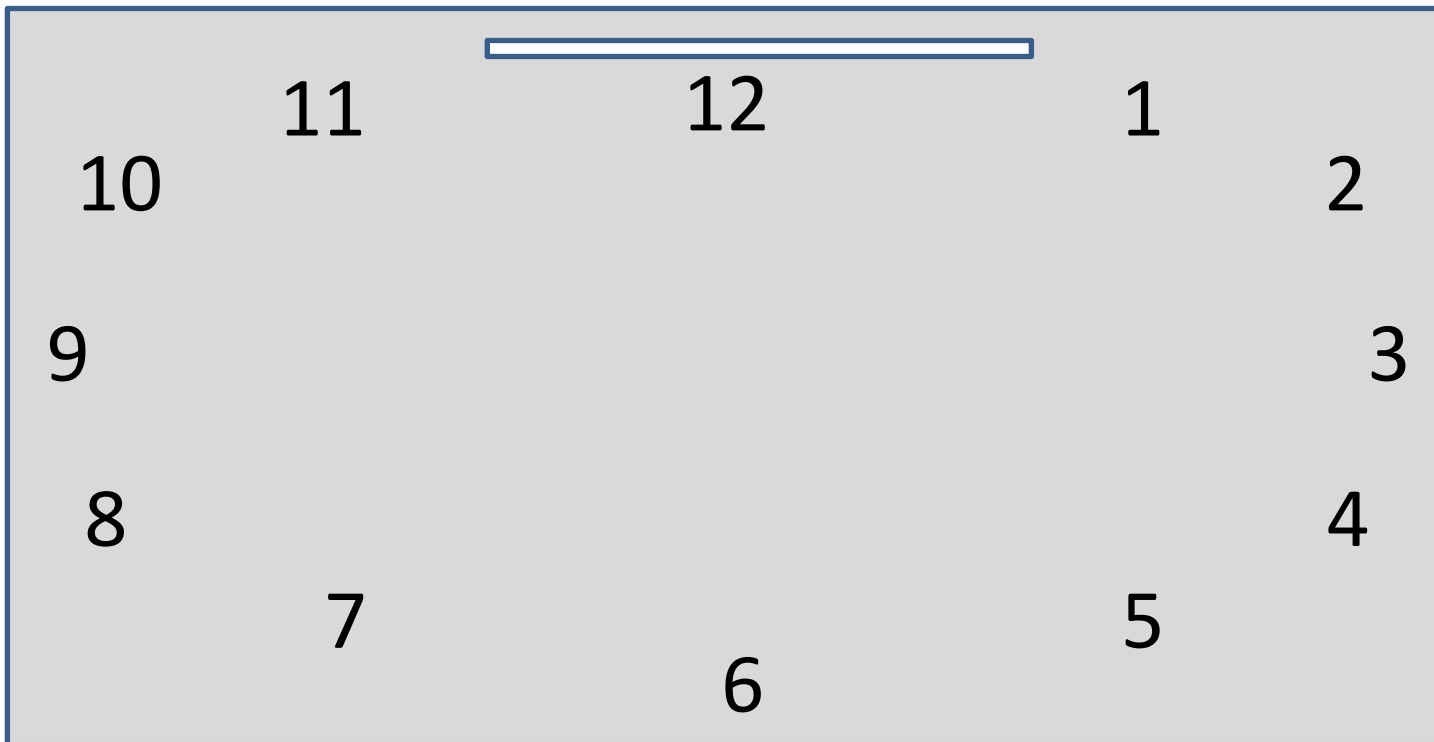
12

# “Computing” Same-Birthday-Groups (using a single hand to communicate)

1) Merge by month (self-organize)

Using the room as a “clock” with front as 12,

Go to your month’s location and show hand with number.



# “Computing” Same-Birthday-Groups (using a single hand to communicate)

2) If you are alone: Sit Down

3) Merge by Day-sets (self organize)

Set 0: Closed Fist if you are in day [0 to 9]

Set 1: 1 finger if you are in day [10 to 19]

Set 2: 2 fingers if you are in day [20 to 29]

Set 3: 3 fingers if you are in day [30 to 31]

# “Computing” Same-Birthday-Groups (using a single hand to communicate)

4) If You are alone: Sit Down

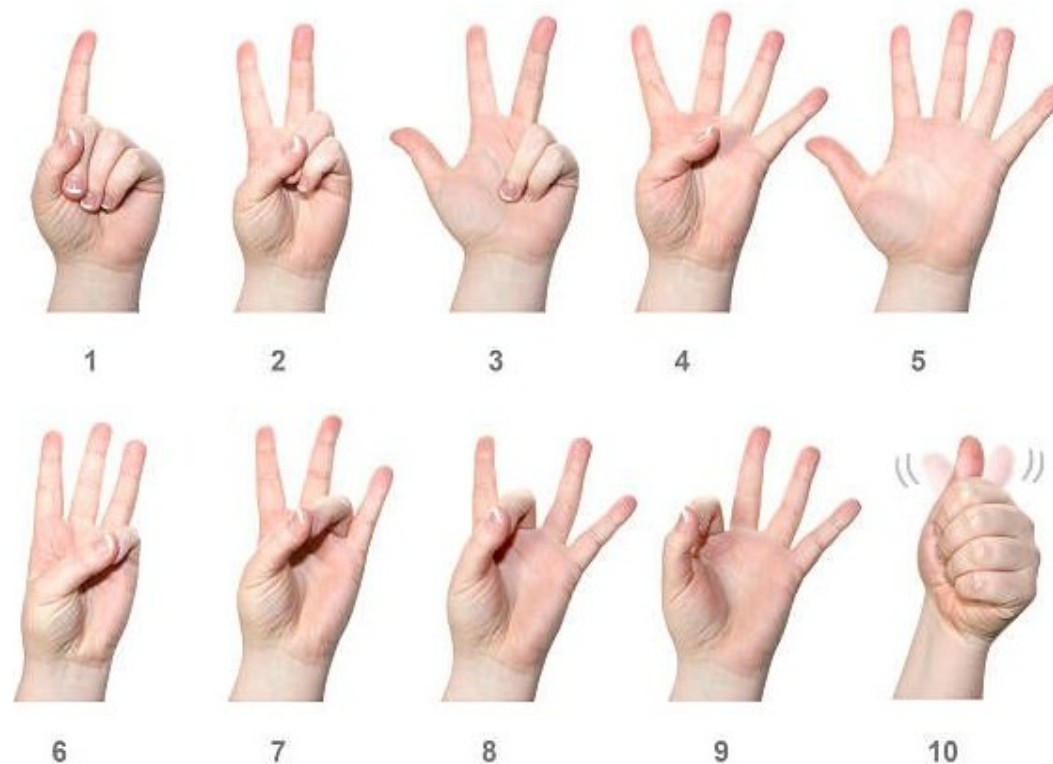
5) Merge by Day (self organize)

- Closed Fist if you are in day [0] of your 10-set

- Use ASL numbers 1-9  
to indicate day

- Example: if you are in  
Day 14, this time

You show a “4”





# “Computing” Same-Birthday-Groups (using a single hand to communicate)

6) If alone, sit down

7) Count members In your group. All except tallest sits down and indicates number with one hand (using ASL)

**The END**

- Was the result surprising?
- How many “Inquiries” did we do?
- How is this related to programming?

Why are you here?

# What is programming?

Discuss with 2 neighbors [1 minute]:

Where, in the previous exercise was there:

- Programming
- Computation

# What is programming?

- Engineering? Art? Skill?
- *What is computer science?*

# Computer Science

- Algorithms and Theory
- Systems – OS, embedded, distributed
- Programming languages – logic and semantics
- Robotics – vision + actuation
- Machine learning – statistical reasoning
- Security – Crypto and protection

# How is programming related to CS?

- Programming [is to] CS
- Telescope [is to] Astronomy
- Proficiency with tools [is to] Construction
- Way to get your foot in the door
  - Many things to come!

Who studies CS?

# Where is CS used?

- CS is everywhere
- Heart of most engineering disciplines
  - Civil – HVAC controllers, CAD, traffic control
  - Mechanical – CAD, simulations, embedded systems for dynamic behavior, supercomputing
  - ECE – reconfigurable hardware, microprocessor design programs, Oses
  - ...



# Where is CS used? II

- Heart of most industries in the world
  - Healthcare – client/doctor mgmt, diagnosis
  - Finance – HFT, trade mgmt software, trend analysis
  - Transportation & Aerospace – Tesla + SpaceX
  - Education – MOOCs
  - Politics – campaign management
  - Climate science – supercomputing and ML
  - Entertainment – movies + music
- ...All aspects of *your* life
  - *Techologies impact on your hourly life? Vs 4 years ago?*

# CS is **not** just

- App programming
- Writing webpages
- Corporate programming
- Hacking
- GUIs
  
- ...boring!!!

# CS is

- CS is the foundation for current and future human achievement
- CS is not just “important”
  - It is **essential**

# Programming

- Not immensely difficult to learn
  - But takes a *lot* of practice
- Think: learning a musical instrument
  - Comparably: difficult to be **really** good
  - You must **commit** to learning, practice
    - Learning/practicing good habits
    - Hard work
- ...but anyone can do it!

# What is “programming”?

Programming language → execution

Code – human readable (Java)

Executable – machine “readable”

Compiler – converts from code → executable

- Google translate for computers
- What happens when you type in nonsense?
- <https://www.youtube.com/watch?v=6Hd0F1QsXR8>
- Must speak language you're translating *from*

Syntax errors – not speaking “java” correctly

# Development Cycle

1. Write code
2. Compile
3. syntax errors? fix them, goto 2.
4. observe output, compare to expected output
5. assess the situation:
  1. did it go wrong?
  2. how did it go wrong?
6. if there is a **bug** goto 1
7. success!

# A Simple Program