

Lab 6

- Review Lab 5
- Pair Programming
- Review strings
- Lab 6

Lab 6: Pair Programming

Every lab,
pairs will change

Anna	Lindsey	Calhoun	Bowie
Findley	Chase	Coats	Burrus
Parker	Andrew	Compoli	Murtaugh
Harris	Kalady	Osowski	Clark
Chas	Margaret	Randolph	Greer
Lizzie	Olivia	Rochelle	Berger
Robert	Ian	Shen	Figueiras
Ben	Rachel	Shetler	Duffield
Mary-Frances	Jordan	Treger	Fritsche
Alison	Ryan	Watson	Hall
Davis	Joseph	Wiencek	Weaver

Pair Programming

- **Two people work together at a single computer**
- **Driver** and **Navigator** work together on one task
- Roles change often
- Collective responsibility for outcome
- One approach used in real world

Pair Programming Tradeoffs

Pros

- Bring together multiple perspectives, experiences, abilities, and expertise
- Higher quality code
 - [Catch bugs earlier](#)
- Knowledge transfer
- Enhanced learning, communication
- Requires 100% engagement

Cons

- Slows down lines per minute
- Loss of autonomy
- Scheduling
- Overconfidence
- Concentration
- Requires 100% engagement

Pair Programming Roles

Driver

- Uses keyboard and mouse to execute all actions on the computer
- Explains actions taken
- Brainstorms

Navigator

- Directs driver's actions
- Checks for errors and typos
- Plans the problem solving or debugging actions
- Asks questions

Your team will create your own workflow

Expectations

- Take collective ownership of the code you and your partner are writing
 - No “my part” and “your part.”
- Be an active, engaged, respectful team player
 - Goal: 50/50 division of labor (brainstorming, typing, testing, problem-solving, debugging, ...)
 - Speak up when you don't understand, think there is an error, or wonder if there is a better way
 - Don't be too proud to admit a mistake
 - Apologize if you hurt your partner's feelings

Expectations

- Be open-minded
 - Pair programming is an opportunity to learn
 - One of the most important predictors of success in pair programming is buy-in: if you are determined to make the practice fail, it will.
- Coordinate breaks (e.g., for bathroom)
- Seek advice when you need it
 - We're still here to help
 - We'll ask even more questions to guide your approach

Expectations

- Don't be bound to the keyboard/mouse/monitor
 - Draw pictures
 - Refer to handouts
- Break down the problem into manageable pieces
 - Not always in order of problem
- Comments – include both authors

Submissions

See lab for more information

- If you finish the lab in class, submit as a pair using `pairturnin.sh`
- Otherwise
 - Run `pairturnin.sh` to save what you have so far
 - If you want to continue working together after lab, you can, BUT you must always work together in pair
 - **No** working on your own
 - Or, you can finish up on your own
 - Run `startup.sh` to copy the shared code into your lab directory

LAB 5 REVIEW

Common Issue: Inefficiency

```
if team1Score > team2Score:
    print("Team 1 wins!")
else:
    if team2Score < team1Score:
        print("Team 2 wins!")
    else:
        if team1Score == team2Score:
            print("They tied! We're going to overtime!")
```

Extra if statement, not necessary

Know when hit second else that the only possibility is a tie

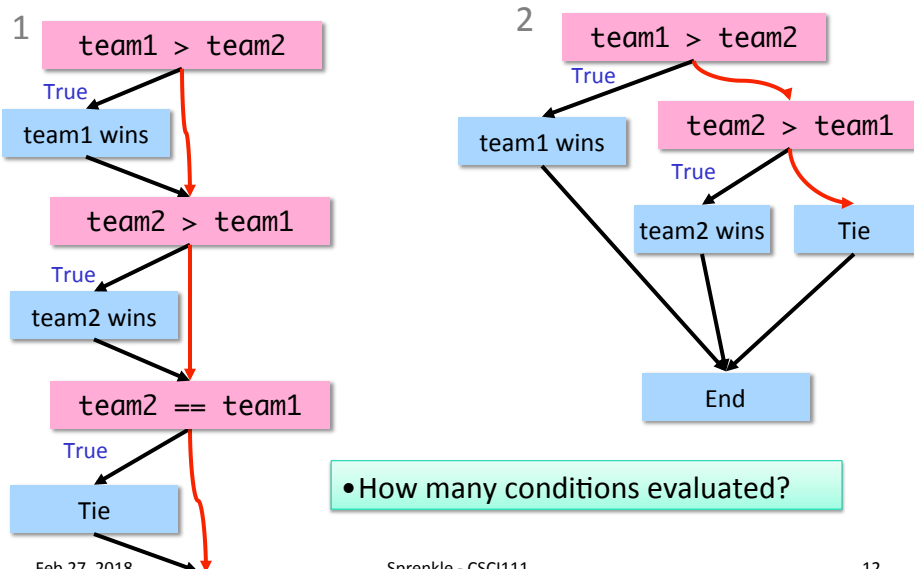
```
if team1Score > team2Score:
    print("Team 1 wins!")
else:
    if team2Score < team1Score:
        print("Team 2 wins!")
    if team1Score == team2Score:
        print("They tied! We're going to overtime!")
```

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Problem 1, 2 Efficiency

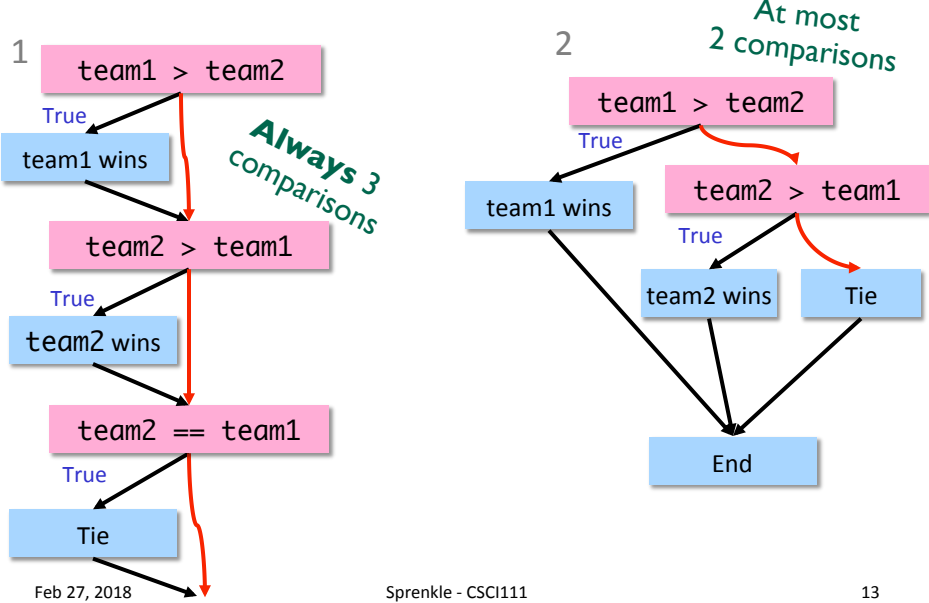


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Sprenkle - CSC111

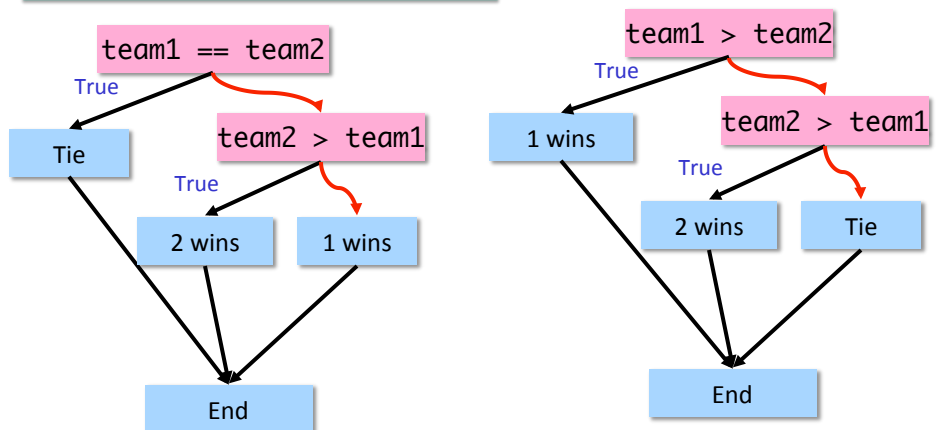
12

Problem 1, 2 Efficiency



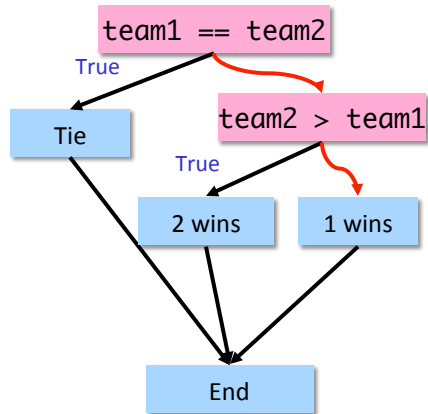
Problem 2 (& 3) Efficiency

Which tends to be more efficient?
How many conditions to evaluate?

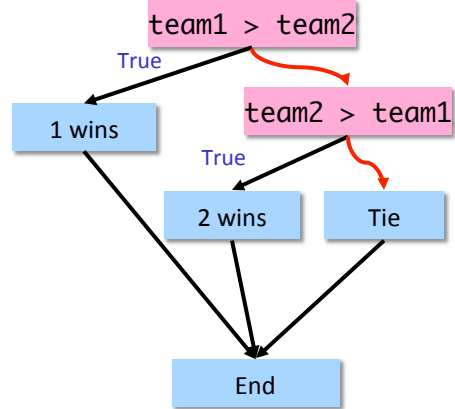


Problem 2 (& 3) Efficiency

Equality is a rare condition;
on average, will always need to
check second condition.



More common case.
May only need to check
one condition.



Adding to Development Process

- Last development step:
 - Assess your program again after it works
 - Is it efficient? Is it readable? Can I simplify?

Lab 5 – Greatest Hits: Less-Complicated Approaches for Customized Display

- Correct but more complicated solution to handling customized display

[Other, similar examples in submissions](#)

```
if albums == 1 and extraTracks == 0:
    print("Your album requires", albums, "cd")
elif albums == 1 and extraTracks > 0:
    print("Your album requires", albums, "cd")
    print(extraTracks, "tracks will have to wait for
          the next Greatest Hits album")
elif albums > 1 and extraTracks > 0:
    print("Your album requires", albums, "cds")
    print(extraTracks, "tracks will have to wait for
          the next Greatest Hits album")
elif albums > 1 and extraTracks == 0:
    print("Your album requires", albums, "cds")
```

Lab 5 – Greatest Hits: Less-Complicated Approaches for Customized Display

- Less complicated solution
 - Simpler logic, conditions
 - Less duplicated code

```
if albums == 1:
    print("Your album requires", albums, "CD.")
else:
    print("Your album requires", albums, "CDs")

if extraTracks > 1:
    print(extraTracks, "tracks will have to wait for
          the next Greatest Hits album")
elif extraTracks==1:
    print(extraTracks, "track will have to wait for
          the next Greatest Hits album")
```

Relational Operators

- Reminder: instead of, for example,

`num < 0 or num > 0`

can use

`num != 0`

Championship Extensions

A lot you could add already;
even more with a little more knowledge

- Simulate scores (rather than the difference)
- Change odds based on home/visiting team
- Dynamically change odds based on who won/lost already in the series
- Today: could stop the series after a team reaches four wins. How?

A new trick: sys module

- `sys.exit(<status code>)`
 - You can typically use a status code of 0.
- Example:

```
import sys

age = int(input("What is your age? "))
if age < 0:
    print("You must enter a positive number.")
    sys.exit(0)
...
```

str Review

- How can we combine strings?
- How can we find out how long a string is?
- How can you tell if one string is contained in another string?
- How can we find out the character at a certain position?
- How can we iterate through a string?
- How do you call a method on a string?

Lab 6

- Advanced conditions
- Indefinite Loops
- Text-based problems