Objectives

- Wrap up indefinite loops
- Text process, manipulation
  - String operations, processing, methods

Review

- How do you tell Python to make decisions in code?
  - What are the different ways to express these decisions?
- What is a definite loop? What is an indefinite loop?
- What is the syntax for writing an indefinite loop?
- Which is more powerful—a `for` loop or a `while` loop? Why?

Problem

- We are grading a science fair.
- There is different criteria for winning first place, depending on what grade you are.
- Given the variables `scienceScore` and `grade`
  - Write a condition that will evaluate to `True` if (and only if) the student's score is above the first place threshold of 60 points and the student's grade is 8.
    - Otherwise, the condition should evaluate to False

Problem

- We are grading a science fair.
- There is different criteria for winning first place, depending on what grade you are.
- Given the variables `scienceScore` and `grade`
  - Write a condition that will evaluate to `True` if (and only if) the student's score is above the first place threshold of 60 points and the student's grade is 8.
    - Otherwise, the condition should evaluate to False

```
scienceScore > 60 and grade == 8
```

`while` Loops: comparing use of `break`

```
# condition says when loop
# will continue
x=eval(input("Enter number:"))
while x % 2 != 0 :
   print("Error!")
   x = eval(input("Enter
              number: "))
print(x, "is an even number.")
```

Says when to keep going

```
# have to look inside loop to
# know when it stops
while True :
   x = eval(input("Enter number:"))
   if x % 2 == 0 :
      break     "breaks" out of a loop
   print("Error!")
print(x, "is an even number.")
```

Says when to stop

Using break statements:
Best when loop has to execute at least once.

Flipping Coins

- Problem: How many flips does it take to get 3 consecutive heads?

consecutiveHeads.py

TEXT PROCESSING

Motivation: Text Processing

- Mostly focused on numbers so far
  - A little on graphics
- We can manipulate strings to do useful work
  - Web search: finding most relevant documents to a query
  - Analyzing web logs (who is looking at my web page?)
  - Many, many others
- **Today's Focus**: the `str` data type and what you can do with them

Strings: `str`

- Used for text
- Indicated by double quotes "" or single quotes ''
  - In general, I'll use double quotes
  - Empty string: "" or ''
- Use triple quotes """ for strings that go across multiple lines

```
"""This string
is long.
Like, really, really long"""
```


STRING OPERATIONS

String Operations

Operand	Syntax	Meaning
+	`str1 + str2`	Concatenate two strings into one string
*	`str * num`	Concatenate string `num` times

- Examples:
  - `"I feel " + "sleepy"`
    - Evaluates to `"I feel sleepy"`
  - `"Oops! " * 3`
    - Evaluates to `"Oops! Oops! Oops! "`

String Comparisons

- Same operations as with numbers:
  - ==, !=
  - <, <=
  - >, >=

  } Alphabetical comparison

- Use in conditions in `if` statements

```
if courseChoice == "CSCI111":
    print("Good choice!")
else:
    print("Maybe next semester")
```

Strings

- A *sequence* of one-character strings
  - Example:

```
band = "The Beatles"
```

characters

End at `len(band)-1`

'T'	'h'	'e'	' '	'B'	'e'	'a'	't'	'l'	'e'	's'
0	1	2	3	4	5	6	7	8	9	10

Start at 0

index or position of characters

Length of the string: 11

Built-in function: `len(string)`

to find length of a string

Iterating Through a String

- Use a `for` loop to iterate through *characters* in a string

string of length 1

```
for char in string:
    print(char)
```

  - Read as "for each character in the string"

Midterm Grade Calculation

- 50% - Exam 1
- 50% - Labs

Broader Issue: Self-Driving Cars

Aimee Katlin Max Sam	Annie B. Landon Pengrui Rinn Turner	Alex JD Liam Prakriti Tristan	Abhi Amalia Angel Daniel Gabe	Chris Drew Pranam Utkrist

Broader Issue: Self-Driving Cars

- Self-driving cars: love 'em or loathe 'em
  - As a passenger?
  - As a driver (or passenger) in another car?
  - As a pedestrian?
- What are the tradeoffs of self-driving cars?
  - What guarantees about the cars would you want from the company/government?
  - Are there situations that would be particularly difficult for software to handle that a person would be better equipped to handle?
- What should the next DARPA challenge be?
- What problem does the ethical knob attempt to solve?
  - Is the "ethical knob" a good solution?

Looking Ahead

- Lab Prep Assignment: Tuesday (in progress)