

PFtWBFB

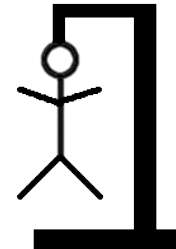
- **Files and formats: how to read and store data**
 - Python, GoogleDocs, Excel, Cloud, ...
 - CSV, XML, ...
- **Tuples, sets, nested-loops, and other sundries**
 - Mutable and immutable collections, iterables
 - When nesting makes sense, when it doesn't
- **Interactivity: playing games using *protocols***
 - Playing solitaire games like *hangman*
 - Playing networked games like *hanging with friends*

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11.1

Generic game-playing loop (solitaire)

```
while not game_over():  
    take_turn()  
    update_state()  
    if lost:  
        update_loser()  
    elif won:  
        update_winner()
```



- **Determine state**
 - Local variables
 - Parameters to functions
 - Initialize appropriately

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11.2

Indefinite loop: while ... *interactivity*

```
wrong = 0  
while wrong < max_wrong:  
    guess = raw_input()  
    if not good_guess(guess):  
        wrong += 1  
    else:  
        #process the guess here
```

- **Suppose, for example, play <http://www.hangman.no>**
 - What happens if you loop while True:
 - Break out of loop with break
 - See code in *GuessNumber.py*

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11.3

Toward playing hangman

- **In the *Hangdemo.py* file some idioms in use:**
 - Functions are "small", do one thing
 - Read words, get words of a specific length, ...
 - Is file-reading code line-oriented? What are repercussions?
- **Which of these will you use in writing *Hangman.py***
 - You can save-as, you can copy/paste
 - Create a working program, then modify it
 - Do NOT write complete game-playing program and debug
 - Grow a program rather than fix a program

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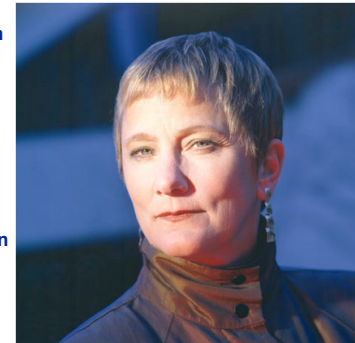
11.4

Use cases for playing hangman

- **What state is used during the game, how updated?**
 - Letters used, checked, purpose?
 - Miss-count kept, updated
 - Secret word, initialized, used?
 - Displayed guess-so-far, e.g., _ _ _ t
 - Other state?
- **Iterative development of program, start small**
 - Make something work, add to it
 - Always lose, always win?
 - Let's write some code

Anita Borg 1949-2003

- “Dr. Anita Borg tenaciously envisioned and set about to change the world for women and for technology. ... she fought tirelessly for the development technology with positive social and human impact.”
- “Anita Borg sought to revolutionize the world and the way we think about technology and its impact on our lives.”
- http://www.youtube.com/watch?v=1yPxd5jqz_Q



Programming idioms

- **Use local variables to keep state**
 - `done = True, ok = False, guesses = 0, guesses += 1, ...`
 - Initialize, update, check, pass as parameters
- **Keep loops small, use functions to do work**
 - Pass parameters, return values, update parameters
 - `process_guess(move, state), if game_over(state),`
- **Use lists when modifying/mutating**
 - Can convert from strings to lists and vice versa

Reading data from files

- **What does `open()` do? What does `close()` do?**
 - What do they return?
- **How to read data from a file**
 - `f.read()` returns entire file as one string, next steps, ...
 - `f.readlines()` returns list of lines in file, loop-it
 - Looping idiom similar, list not created

```
f = open("name")
for line in f:
    process line
```

```
f = open("name")
for line in f.readlines():
    process line
```

Idioms and Patterns

- **How do you loop over a list?**
 - "look" at each element once conceptually? Loop once
 - Consider the Alliteration APT as an example
- **How do you loop over two or more lists?**
 - Looping in parallel, i.e., `a[i]` and `b[i]` ... one loop
 - What about FortunateNumbers APT, is this similar?
 - Looping with `i,j` or `i,j,k` or ...
- **One loop for linear structures: a pattern**
 - Use state to examine one before/one after, don't nest

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11.9

Useful Python structures and idioms

- `'x'.join(['a','e','i','o','u'])`
 - What's the function here? What's the parameter?
 - What is `'_'.join("aeiou")` and why?
 - Can we use `"` and `""` in Python? Why both?
- **What happens if we turn a list into a set**
 - `x = set(['a','a','b','b','b'])`
 - Why is this possibly useful, e.g., creating search engine?
- **What can we do with a random number**
 - And why would we want to?

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Functions, parameters, communication

- **Lists, sets, strings objects/state created somewhere**
 - After creation, pass state to other functions
 - Some state belongs together, collect/create in same place
 - Group together in tuples, lists, class (later)
- **In Python default and named parameters**

```
def make_letter(name='John' title='Doctor'):  
    print Dear,title,name,": "  
  
make_letter('Susan', 'President')  
make_letter(name='Fred')  
make_letter(title='Loser', name='Xerxes')  
make_letter('Emperor', 'Jones')
```

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11.11

Brian Fox

- GNU Bash Shell (developer)
 - Buddycast (co-developer)
- “each person has a sweet spot — a place where they are incredibly productive and at their happiest while doing so — okorians spend their lives living there — the okori sweet spot is the realization of the concept, the delivery of the impossible, from the germ of the idea to the instantiation of it”

<http://www.theokorigroup.com/why>



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