

# Why Program?

## Chapter 1



Python for Everybody  
[www.py4e.com](http://www.py4e.com)



# Computers want to be helpful...

- Computers are built for one purpose - to do things for us
- But we need to speak their language to describe what we want done
- Users have it easy - someone already put many different programs (instructions) into the computer and users just pick the ones they want to use



What  
Next?

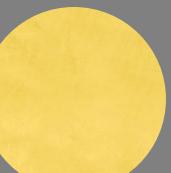
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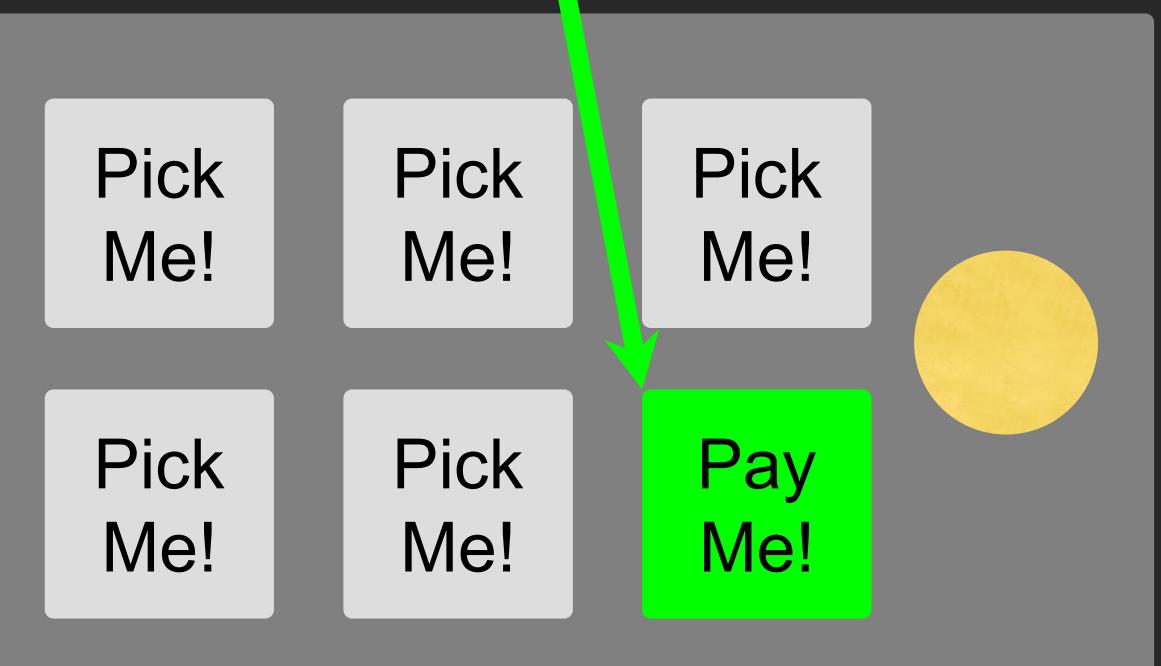
What  
Next?

What  
Next?



# Programmers Anticipate Needs

- iPhone Applications are a market
- iPhone Applications have over 3 Billion downloads
- Programmers have left their jobs to be full-time iPhone developers
- Programmers know the **ways of the program**





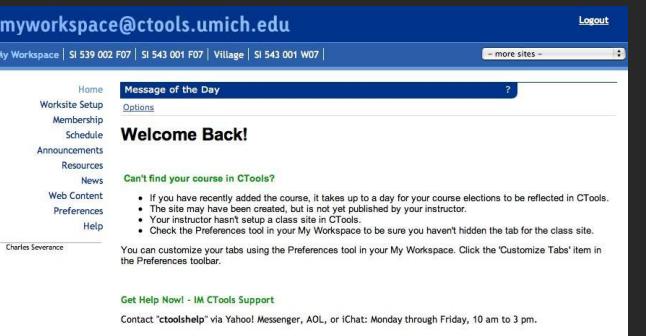
# Users vs. Programmers

- Users see computers as a set of tools - word processor, spreadsheet, map, to-do list, etc.
- Programmers learn the computer “ways” and the computer language
- Programmers have some tools that allow them to build new tools
- Programmers sometimes write tools for lots of users and sometimes programmers write little “helpers” for themselves to automate a task

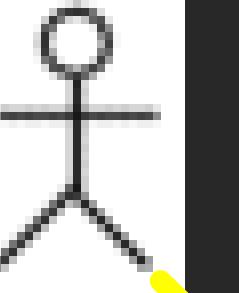


# Why be a programmer?

- To get some task done - we are the user and programmer
  - Clean up survey data
- To produce something for others to use - a programming job
  - Fix a performance problem in the Sakai software
  - Add a guestbook to a web site



User



Programmer

From a software creator's point of view, we build the software. The end users (stakeholders/actors) are our masters - who we want to please - often they pay us money when they are pleased. But the data, information, and networks are our problem to solve on their behalf. The hardware and software are our friends and allies in this quest.



# What is Code? Software? A Program?

- A sequence of stored instructions
  - It is a little piece of our intelligence in the computer
  - We figure something out and then we encode it and then give it to someone else to save them the time and energy of figuring it out
- A piece of creative art - particularly when we do a good job on user experience

# Programs for Humans...



<https://www.youtube.com/watch?v=gwWRjvwILKg>

# Programs for Humans...

while music is playing:

Left hand out and up

Right hand out and up

Flip Left hand

Flip Right hand

Left hand to right shoulder

Right hand to left shoulder

Left hand to back of head

Right hand to back of head

Left hand to right hit

Right hand to left hit

Left hand on left bottom

Right hand on right bottom

Wiggle

Wiggle

Jump



<https://www.youtube.com/watch?v=gwWRjvwILKg>

# Programs for Humans...

while music is playing:

Left hand out and up

Right hand out and up

Flip Left hand

Flip Right hand

Left hand to right shoulder

Right hand to left shoulder

Left hand to back of head

Right **ham** to back of head

Left hand to right **hit**

Right hand to left **hit**

Left hand on left bottom

Right hand on right bottom

Wiggle

Wiggle

Jump



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# Programs for Humans...

while music is playing:

Left hand out and up

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Left hand to right shoulder

Right hand to left shoulder

Left hand to back of head

Right hand to back of head

Left hand to right hip

Right hand to left hip

Left hand on left bottom

Right hand on right bottom

Wiggle

Wiggle

Jump



<https://www.youtube.com/watch?v=gwWRjvwILKg>

# Programs for Python...

the clown ran after the car and the car ran into the tent and  
the tent fell down on the clown and the car



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# Programs for Python...



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```
name = input('Enter file: ')
handle = open(name)

counts = dict()
for line in handle:
    words = line.split()
    for word in words:
        counts[word] = counts.get(word, 0) + 1

bigcount = None
bigword = None
for word, count in counts.items():
    if bigcount is None or count > bigcount:
        bigword = word
        bigcount = count

print(bigword, bigcount)
```

```
python words.py
Enter file: words.txt
to 16
```

```
python words.py
Enter file: clown.txt
the 7
```



# Hardware Architecture