

CS150 - While loops

Note Title

2/6/2012

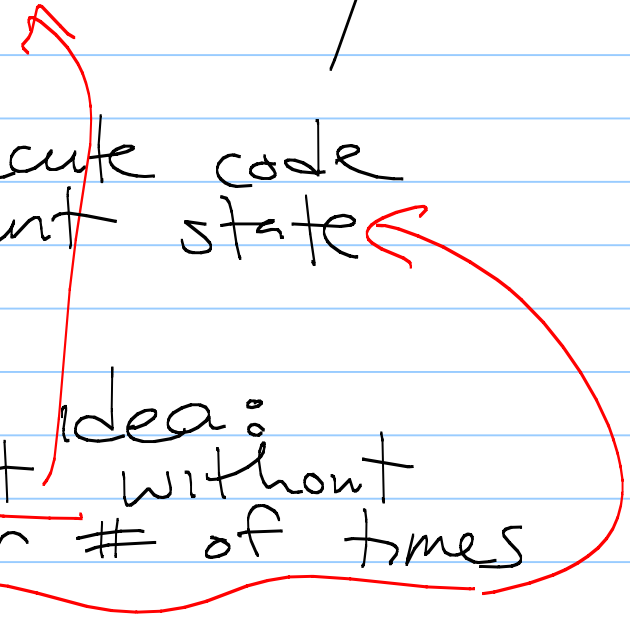
Announcements

- HW1 grades emailed last night
- HW3 due Monday
- Midterm 1 in ~2 weeks

Recap: practice from last time

Given a list of words, create a new list called short words that consists of any words in the list that have ≤ 3 characters.

While loops (Ch 5.1)

- For loops iterate through an already existing sequence
 - If statements let us execute code without knowing current state ahead of time
 - While loops combine this idea: specify code to repeat without knowing sequence or # of times ahead of time
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While loops

Syntax:

```
while condition :  
    [ body :  
      code to repeat
```

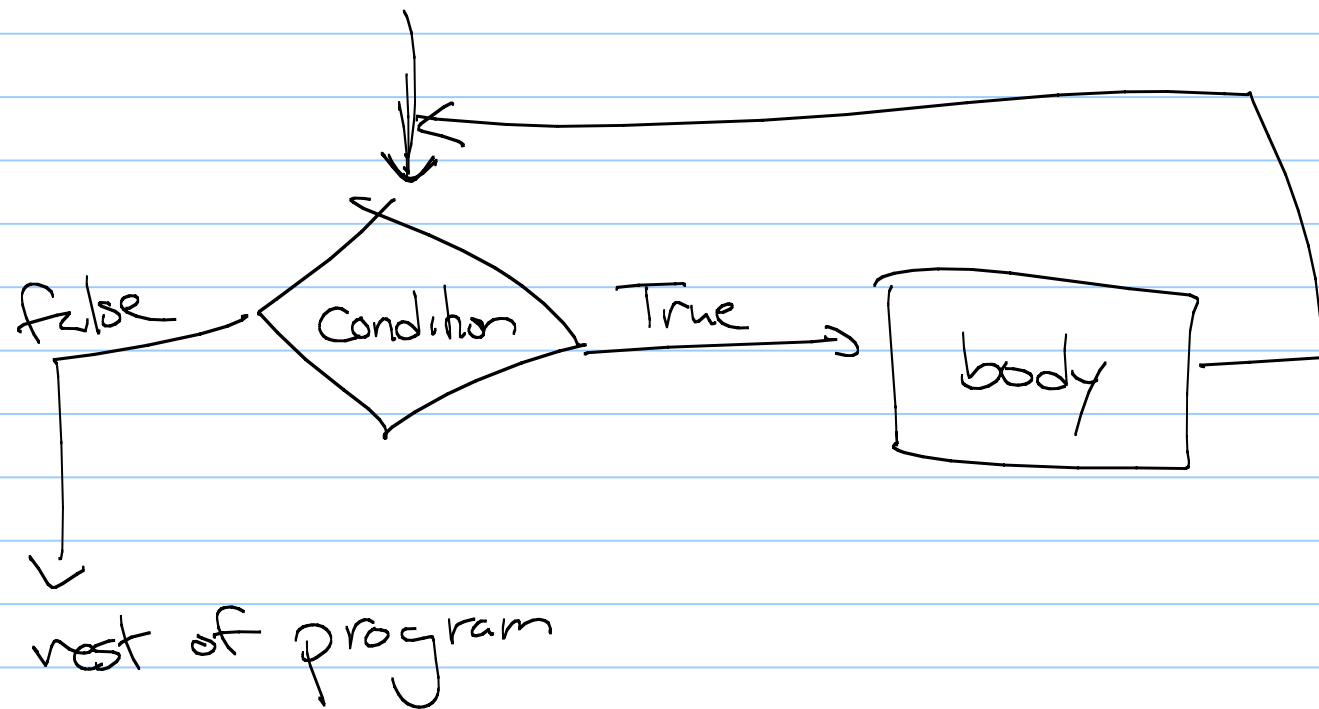
- Condition can be arbitrary boolean expression
- body can consist of many statements,
all indented

Example

```
response = raw_input('Would you like to  
play a game?')
```

```
while response.lower() == 'y' or response.lower() == 'yes':  
    # code to play a game  
    ;  
    response = raw_input('Would you like to play again?')
```

Flow diagram



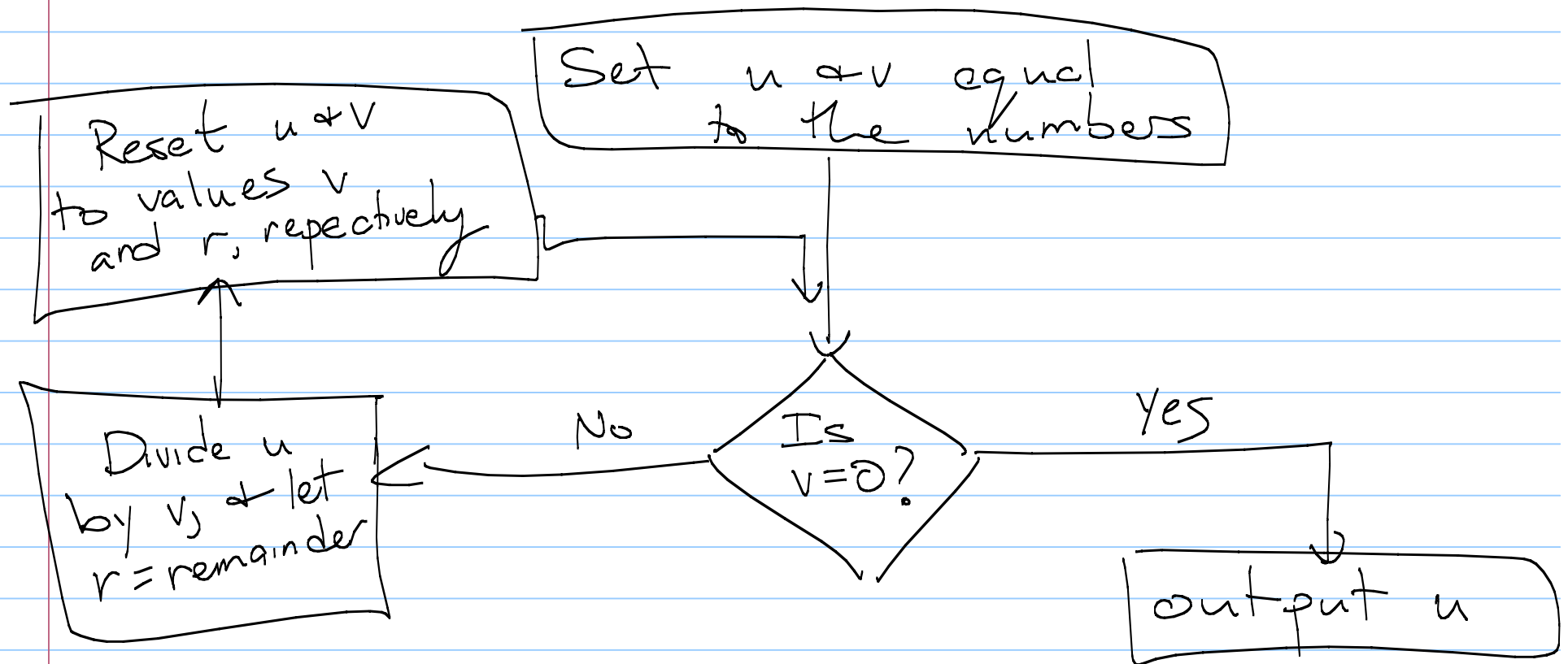
Greatest common divisor

Recall that $\text{gcd}(x, y)$ is the greatest common divisor of x and y .

Given x, y , what was our first idea for what values to check as possible common divisors?

26 59
Slow

Example: GCD again (Euclid's algorithm)



Another example: searching in a list

value in mylist
↳ True or False

Sequential or linear search is a program to search for an element in a list.

Example:

```
theList = [5, 20, -1, 3, 99, 64, 7]
```

```
number = int(raw_input('Enter a number to look for:'))
```

```
# loop to search for number  
(code this example)
```

Ex: (cont)

Consider $[5, 20, -1, 3, 99, 64, 7]$

Search for 20.

How many comparisons?

How many do we need to do?
(ie when can we stop?)

A better way: Sequential Search

$i = 0$
found = False

while $i < \text{len}(\text{data})$ and not found:
 if $\text{data}[i] == \text{val}$:
 found = True
 else:
 $i += 1$