Administrivia

• Homework 3 is due Friday
• Homework 4 assigned Monday
• Midterm 1 is coming February 29th
REVIEW
a=1

def fun(a,b):
    return a+b

a=fun(a,a)+a

What is the value of a?

a) 2
b) 3
c) 4
d) None of the above.
a=1
def fun(c,b):
    return c+b
a=fun(a,a)+a

What is the value of a?
a) 2
b) 3
c) 4
d) None of the above.
x=10
if ((x/2)<5) or ((x%3)==1):
    x=x+2
if (x!=10) or ((x**2)<=144):
    x=x*2

What is the value of x?

a) 10
b) 12
c) 20
d) 24
def fun(x):
    if x and x:
        return not x
    else:
        return x or x

x = fun(True) or fun(False)

What is the value of x?
a) True
b) False
def fun(a,b):
    if len(a)+len(b)>5:
        return (a+b)[0:5]
    else:
        return (b+a)+str(len(a))

x=fun(“abc”,”def”)+fun(“gh”,”ij”)

What is the value of x?
a) “abcdefijgh4”
b) “defabcghij4”
c) “abcdeijgh4”
d) None of the above.
def fun(x):
    if x<100 or ???:
        return x+1
    else:
        return x

Increment x if the 100’s place is 0:
a) x.string(3)==’0’
b) str(x)[-3]==’0’
c) ((x/100)%10)==0
d) None of the above.
CONDITIONAL EXECUTION
Conditional Execution

• Make decisions in our program
• Change program behavior
  – Based on a Boolean value
• Change the *control flow*
If statement

- We create an *if statement* by typing:
  1. the keyword *if*
  2. a Boolean expression
  3. a *block* of code
print("Welcome to my program.")
answer=input("Are you nice?")
if answer=="Yes":
    print("Hello, friend!")
Alternative Execution

• Make decisions in our program
• Change program behavior
• Change the *control flow*
• Execute one block *or* another
Alternative Execution

True

if block

False

else block
If... else statement

• We create an *if... else statement* with:
  1. the keyword *if*
  2. a Boolean expression
  3. a *block* of code
  4. the keyword *else*
  5. another *block* of code
print "Welcome to my program."
answer=input("Are you nice?")
if answer=="Yes":
    print("Hello, friend!")
else:
    print("HEY! BE NICE!")
def absolute(x):
    if x>=0:
        return x
    else:
        return -x
BOOLEANS AND STRINGS
Boolean string methods

- `isdigit()` - “Is the string all digits?”
- `isalpha()` - “Is the string all letters?”
- `islower()` - “Is the string all lower case?”
- `isupper()` - “Is the string all upper case?”
answer=input(“Are you nice?”)
if not answer.isalpha():
    print(“I don’t understand.”)
else:
    print(“I think I understand.”)
Sequence operators

• in “Is this string inside the other?”
• not in “Is this string NOT inside the other?”
```python
def fun(s):
    return s.isalpha() and "s" in s

x = fun("sam") and fun("AS")
```

What is the value of `x`?

a) True
b) False
Nesting

• Sometimes, we need to make *more than one decision*

• We can *nest* blocks
  – One block inside the other
  – We’ve already been nesting conditionals and functions
answer=input("Hello!")
if not answer.isalpha():
    print("I don’t understand.")
else:
    if answer.isupper():
        print("Don’t shout!")
    else:
        print("Thanks!")
not alphabetical?

True

“I don’t understand.”

False

all upper case?

True

“Don’t shout!”

False

“Thanks!”
x is positive?

True

x is even?

True

x

False

x + 1

False

x is even?

True

-x

False

(-x) + 1
def evenpos(x):
    if x >= 0:
        if (x % 2) == 0:
            return x
        else:
            return x + 1
    else:
        if (x % 2) == 0:
            return -x
        else:
            return (-x) + 1
Multi-way branch

- Sometimes, we want to choose between multiple choices
- Example: day of week => string
if day==1:
    print("Sunday")
else:
    if day==2:
        print("Monday")
    else:
        if day==3:
            print("Tuesday")
        else:
            if day==4:
                print("Wednesday")
            else:
                if day==5:
                    print("Thursday")
                else:
                    if day==6:
                        print("Friday")
                    else:
                        if day==7:
                            print("Saturday")

This sucks!
elif

- Shorthand for **else if**
- We don’t need to indent again!
if day==1:
    print("Sunday")
elif day==2:
    print("Monday")
elif day==3:
    print("Tuesday")
elif day==4:
    print("Wednesday")
elif day==5:
    print("Thursday")
elif day==6:
    print("Friday")
elif day==7:
    print("Saturday")
else:
    print("That is not a valid day.")