# CHEATSHEET: Python II, Control Flow

| Function | Description | Example |
|---|---|---|
| `range()` | makes a list of a certain range of numbers | `range(0,20)` makes a list from 0 to 19, 20 numbers where the first is inclusive and the last is exclusive<br>`range(0,20,2)` makes the same list but counts by 2 |
| `input()` | asks the user for input, stores as variable | `x=input("Enter a phrase: ")` saves what user inputs as variable x |

| Module | Description | Example |
|---|---|---|
| `random` | random number generator | `random.random()` picks a value between 0 and 1<br>`random.randint(0,10)` randomly picks a value between 0 and 10 |
| `time` | anything to do with timing | `time.asctime( time.localtime(time.time()) )` prints current date and time |

**FOR is for iterating over values in a list, string, file, range, etc**

```
for item in thing:
    do this command #return to for statement and
                    #move to next item
```

Example: print 20 numbers (actually prints 0 to 19)

```
for i in range(20):
    print i
```

**IF is the basic decision making tool**

```
if logical condition == True:
    do this command
```

```
sequence='AGGGTGTGTCCTGA'
if 'AGG' in sequence:
    print 'I found your sequence'
```

**IF ELSE is used for decision making in an either or context**

```
if logical condition == True:
    do this command
else:
    do this command
```

```
seqs=['AUUGACAUCGAUCGA','AGACTGATCGATCTAG']
for seq in seqs:
    if 'U' in seq:
        print '%s is RNA' %seq
    else:
        print '%s is DNA' %seq
```

**IF ELIF is useful when you have more than one condition to check before deciding**

```
if logical condition == True:
    do this command
elif other logical condition == True:
    do this command
else:
    do this command
```

```
seqs=['AUUGACGAUCGA','AGACTGAATCTAG','JIEONONE']
for seq in seqs:
    if 'U' in seq:
        print '%s is RNA' %seq
    elif 'T' in seq:
        print '%s is DNA' %seq
    else:
        print '%s might be a protein' %seq
```

**WHILE is useful for checking input types, and when your value in the conditional might change within the loop**

```
while condition == True:
    do this command
```

```
x=int(input("Type a number from 1 to 10: "))
while x not in range(0,11):
    print "That's not a number between 1 and 10"
    x=int(input("Type a number from 1 to 10: "))
print "Thanks!"
```

**COMPREHENSIONS are faster than for loops and good to use when you're sifting through a long list or range**

```
list1=[] #make empty list
for item in thing:
    list1.append(item)
```

```
list1 = [item for item in thing]
numbers=range(1000)
l=[x**3 for x in numbers]
```

**FOR LOOP IN BASH**

```
for x in list; do command to variable x; done
for i in *.fasta; cat $i >> newseqs.fasta; done
```