

CS21: INTRODUCTION TO COMPUTER SCIENCE

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Swarthmore College

Outline Sept 22:

- Nesting (telephone.py)
- Lab 1 and research examples
- String formatting
- Next time:
 - range(..) with multiple parameters
 - ascii (ord and chr)

Notes

- **Lab 2** due **Saturday** night
- **Office hours today 3-5pm** (room 260)
- **Ninja session tonight 7-9pm** (room 256)

Lab 1 examples

(not posted online)

Research examples

Computational biology examples

```
# loop over the haplotypes  
keep_haps = []  
for i in range(N):  
    hap = f.readline()  
  
    if anc_der[i] == 'a': # if the haplotype is ancestral  
        keep_haps.append(hap)
```

Nesting

```
# loop through the files and add haplotypes  
total_haps = []  
for filename in file_lst:  
    positions, keep_haps = parse_mbs_file(filename)  
    total_haps = total_haps + keep_haps
```

Accumulator pattern

Notecard feedback

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- 1) **Something you understand well:** conditionals, types, input, print, math operations, variables
- 2) **Most confusing:** for loops, range, indexing, accumulators, random, importing libraries
- 3) **Change about the course:** more examples, go over labs, more optional practice, more time, smaller class

String formatting

String formatting

- **%d** – decimal (same behavior as **%i** it turns out!) use for integers, in newer python formatting **%i** is sometimes not supported
- **%f** – float, use **%8.2f** (for example) to make each float be 8 characters total (spaces used as padding on the left), rounded to 2 decimal places
- **%s** – string (same notation applies, but **%8.2s** will pad with spaces as well as truncate to 2 characters)

String formatting examples

```
>>> string = "code"
>>> z = 35
>>>
>>> print("My %s is %d lines long." % (string, z))
My code is 35 lines long.
>>>
>>> p = 3.141592
>>>
>>> print("Pi is about %f" % p)
Pi is about 3.141592
>>>
>>> print("Pi is about %.2f" % p)
Pi is about 3.14
>>>
>>> print("Pi is about %.4f" % p)
Pi is about 3.1416
>>> num_lst = [234.575742, 14.46574, 8.231235, 19.4239823928398]
[>>> for num in num_lst:
[...     print("lining up numbers: %7.3f" % num)
[...
lining up numbers: 234.576
lining up numbers:  14.466
lining up numbers:   8.231
lining up numbers:  19.424
```