

CS21: INTRODUCTION TO COMPUTER SCIENCE

Prof. Mathieson

Fall 2018

Swarthmore College

Outline Oct 26:

Sit somewhere new!

- Continue TDD for word-guesser program
- Implement a few functions for word-guesser
- TDD for 9-letter-word program
- Next week: continue TDD and bottom-up implementation

Notes

- **Lab 6** due **Saturday** night
- Ninja session tonight! 7-9pm in this room
- Office Hours **today!! Friday 3-5pm**

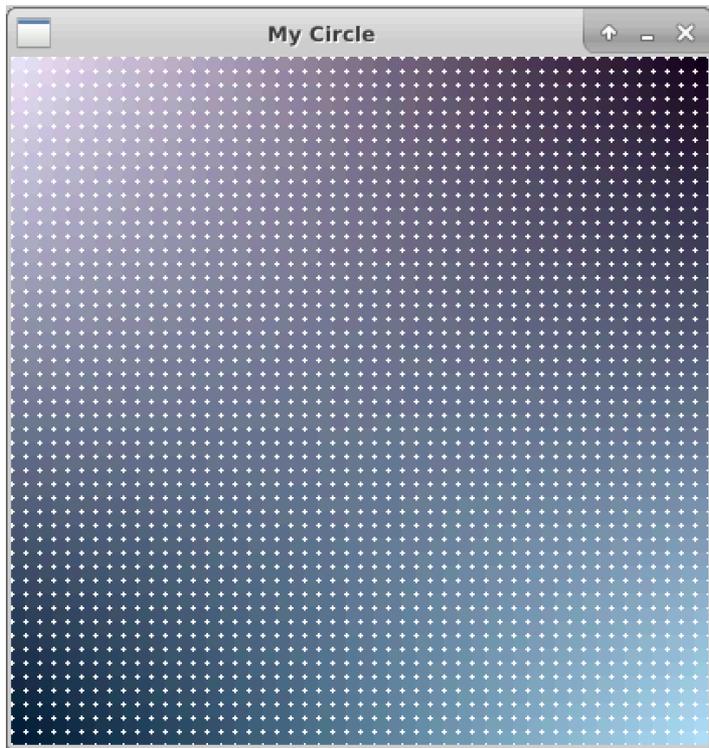
Lab 3 examples (selected by graders)

DNA extensions (code not posted online)

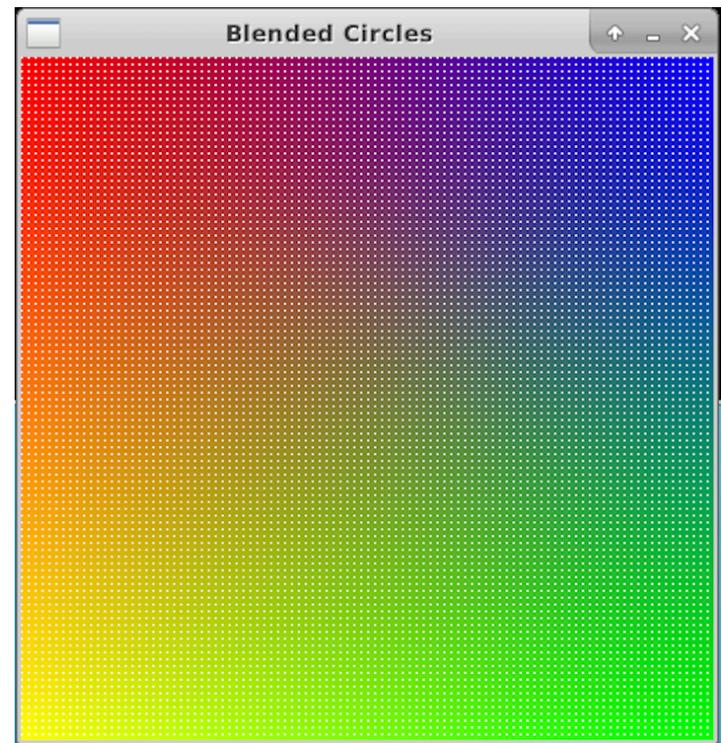
- Francesco
- Theo
- Sarah

Lab 6 examples
(email me screenshots!)

Lab 6 circle examples

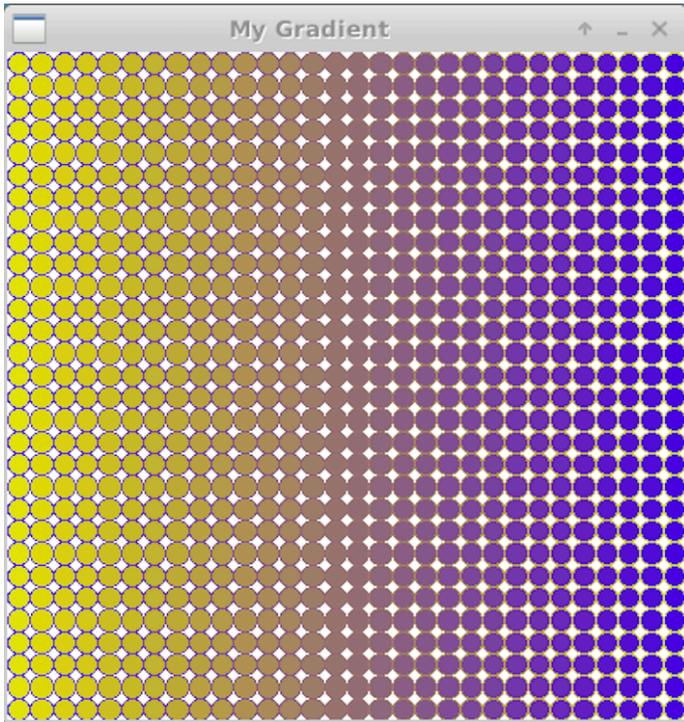


Aron



Helen

Lab 6 circle examples



Ilana

TDD example from my research

```

def parse_archaic(filename, hap_collection):
    """
    From the VCF file with archaic individuals, parse out the SNP data and
    include it in our collection of haplotypes
    """
    pass

def parse_chimp(filename, hap_collection):
    """
    From the VCF file with chimp as the first sample, set the ancestral state
    to chimp *if* the chimp is homozygous.
    """
    pass

def parse_1000g(filename, hap_collection):
    """
    Parse 1000 genomes file (using YRI to get the most SNPs) to get just the
    ancestral state (overwrite existing states set by chimp).
    """
    pass

def parse_location(filename, hap_collection):
    """
    Parse the location file and set the superpop and pop for each haplotype.
    """
    pass

def parse_sgdp(filename, hap_collection):
    """
    Given an empty haplotype collection object and a vcf filename, populate
    the collection with snps and haplotypes.
    """
    pass

def choose_color(snp_pos, base, der, alt):
    """
    First set the color for all SNPs, then check Ameer, then check our core,
    then set to yellow/orange if we don't know ancestral/derived, then set to
    red if the base is unknown.
    """
    return "blue"

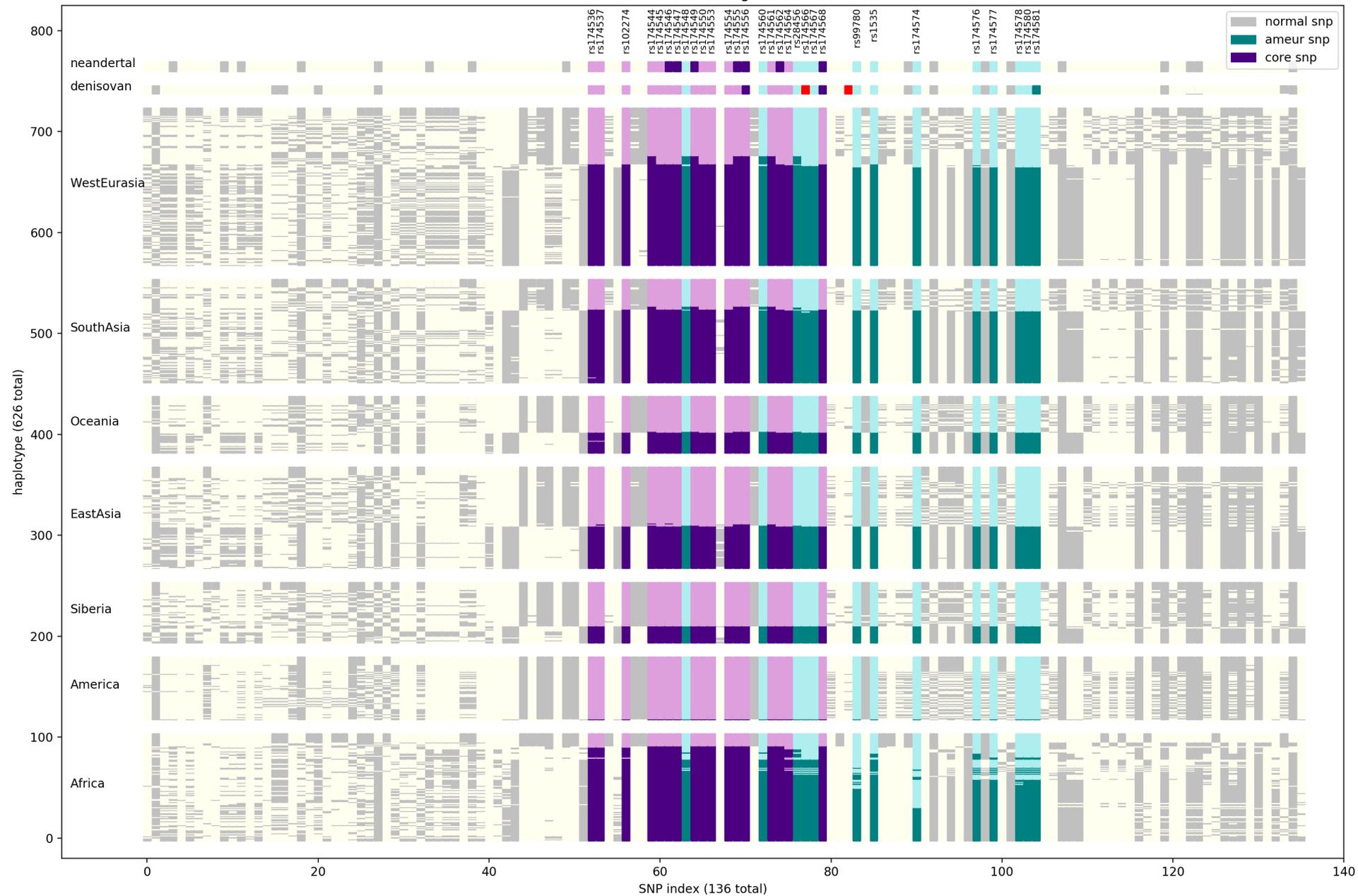
def plot_haplotypes(hap_collection, sorted_haps):
    """
    Plot the SNPs if they are not rare and are segregating.
    """
    pass

def populate_collection(sgdp_file, pan_file, geno_file, arc_file, loc_file):
    hap_collection = HapCollection()
    return hap_collection

```

This code parses several different files to create a plot (next slide) of a specific gene involved in human diets.

SGDP: dark=DER, light=ANC



Converting between lists and strings

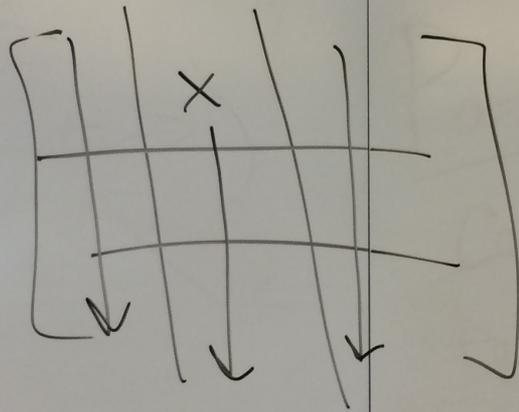
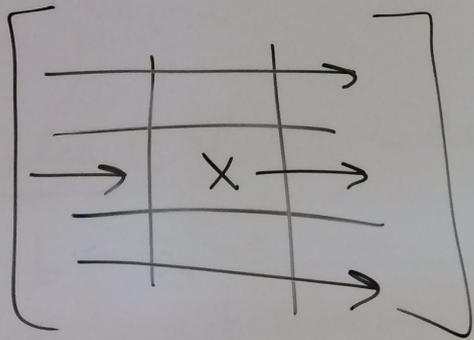
- Convert a list to a string: `<string separator>.join(lst)`

```
>>> lst = ['s','w','a','t','h','m','o','r','e']
>>>
>>> "".join(lst)
'swathmore'
>>>
>>> "-".join(lst)
's-w-a-t-h-m-o-r-e'
```

- Convert a string to a list: `list(<string>)`

```
>>> string = 'swathmore'
>>>
>>> list(string)
['s', 'w', 'a', 't', 'h', 'm', 'o', 'r', 'e']
```

Handout 6 Function Ideas



- * get guess.
- * read dictionary
↳ only a letters.
- * correct
↳ end the game
- * display word
in a board
- board (empty)
- put in word
- randomness