

This is CS50.

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cs50.brianyu.me

Roadmap

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
March	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
April	30	31	1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
May	27	28	29	30	1	2	3
	4	5	6	7	8	9	10

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	
March	9	10	11	12	13	14	15	Python
	16	17	18	19	20	21	22	
	23	24	25	26	27	28	29	
April	30	31	1	2	3	4	5	
	6	7	8	9	10	11	12	
	13	14	15	16	17	18	19	
	20	21	22	23	24	25	26	
May	27	28	29	30	1	2	3	
	4	5	6	7	8	9	10	

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	
March	9	10	11	12	13	14	15	
	16	17	18	19	20	21	22	Spring Break
	23	24	25	26	27	28	29	
April	30	31	1	2	3	4	5	
	6	7	8	9	10	11	12	
	13	14	15	16	17	18	19	
May	20	21	22	23	24	25	26	
	27	28	29	30	1	2	3	
	4	5	6	7	8	9	10	

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	
March	9	10	11	12	13	14	15	
	16	17	18	19	20	21	22	
	23	24	25	26	27	28	29	SQL
April	30	31	1	2	3	4	5	
	6	7	8	9	10	11	12	
	13	14	15	16	17	18	19	
	20	21	22	23	24	25	26	
May	27	28	29	30	1	2	3	
	4	5	6	7	8	9	10	

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March	9	10	11	12	13	14	15	
	16	17	18	19	20	21	22	
	23	24	25	26	27	28	29	
April	30	31	1	2	3	4	5	Test
	6	7	8	9	10	11	12	
	13	14	15	16	17	18	19	
	20	21	22	23	24	25	26	
May	27	28	29	30	1	2	3	
	4	5	6	7	8	9	10	

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	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
April	30	31	1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
May	20	21	22	23	24	25	26
	27	28	29	30	1	2	3
	4	5	6	7	8	9	10

Web Programming

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	
March	9	10	11	12	13	14	15	
	16	17	18	19	20	21	22	
	23	24	25	26	27	28	29	
April	30	31	1	2	3	4	5	
	6	7	8	9	10	11	12	
	13	14	15	16	17	18	19	Flask
	20	21	22	23	24	25	26	
May	27	28	29	30	1	2	3	
	4	5	6	7	8	9	10	

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
March	9	10	11	12	13	14	15
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	4	5	6	7	8	9	10

Final Projects

Zoom



Week 6

- Python
- Regular Expressions

What questions do you have?

Questions

Today

Python

CSV Files

Regular Expressions

PART ONE

Python

Variables

`x = 28` `int`

`x = 1.5` `float`

`x = "Hello!"` `str`

`x = True` `bool`

Variables

`x = [1, 2, 3, 4]` `list`

`x = (10, 20)` `tuple`

`x = {`
 `"EMMA": "617-555-0100",` `dict`
 `"BRIAN": "617-555-0101"`
`}`

`x = {"a", "b", "c"}` `set`

Dictionaries

- Mapping of keys to values

Dictionaries

word	definition
apple	the round fruit of a tree of the rose family
balloon	a brightly colored rubber sac inflated with air and then sealed
car	a road vehicle, typically with four wheels, powered by a combustion engine
day	a period of twenty-four hours as a unit of time

Dictionaries

key	value

Dictionaries

name	number
EMMA	617-555-0100
RODRIGO	617-555-0101
BRIAN	617-555-0102
DAVID	617-555-0103

Dictionaries

property	value
first	Emma
last	Humphrey
email	<u>emma@cs50.harvard.edu</u>
house	Dunster

Dictionaries

dna	repetitions
AATG	28
TATC	5
CAAT	14
TCTTA	50

Dictionaries

```
names = {  
    "EMMA": "617-555-0100",  
    "BRIAN": "617-555-0101"  
}
```

```
names["RODRIGO"] = "617-555-0102"
```

```
print(names["EMMA"])
```

Loops

```
names = ["Alice", "Bob", "Charlie"]  
for name in names:  
    print(name)
```

Loops

```
name = "EMMA"  
for character in name:  
    print(character)
```

Loops

```
for i in [0, 1, 2, 3, 4]:  
    print(i)
```

Loops

```
for i in range(5):  
    print(i)
```

Functions

```
def square(x):  
    return x * x
```


File I/O

```
file = open(filename, "r")
```

Exercise

Write a program `reverse.py` that reverses a string.

Sample Usage

```
$ python reverse.py
```

```
Text: Hello!
```

```
!olleH
```

Exercise

Write a program `addition.py` that adds two numbers provided as command-line arguments.

Sample Usage

```
$ python addition.py 2 8
```

```
2 + 8 = 10
```


PART TWO

CSV Files

first, last

Emma, Humphrey

Ashley, Wong

Diana, Feng

Montague, Mawere

```
import csv
```

Exercise

Write a program `phonebook.py` that reads from a CSV file (provided as a command-line argument) and prints out the data on each person in the phone book. The file contains columns **name** and **number**, representing each person's name and phone number, respectively.

Sample Usage

```
$ python phonebook.py data.csv
```

```
Emma's phone number is 617-555-0100
```

```
Rodrigo's phone number is 617-555-0101
```

```
Brian's phone number is 617-555-0102
```

```
David's phone number is 617-555-0103
```


PART THREE

Regular Expressions

Regular Expressions

Expression

hi

Matches

hi

Regular Expressions

Expression

`hi|hello`

Matches

`hi`

`hello`

Regular Expressions

Expression

`hi?`

Matches

`h`

`hi`

Regular Expressions

Expression

`hi*`

Matches

`h`

`hi`

`hii`

`hiii`

`hiiii`

`...`

Regular Expressions

Expression

`hi+`

Matches

`hi`

`hii`

`hiii`

`hiiii`

`...`

Regular Expressions

Expression

`hi{3}`

Matches

`hiii`

Regular Expressions

Expression

•

Matches

a

A

2

8

!

• • •

Regular Expressions

Expression

Matches

`\.`

`.`

Regular Expressions

Expression

`[a-z]`

Matches

a

b

c

...

z

Regular Expressions

Expression

[A-Z]

Matches

A

B

C

...

Z

Regular Expressions

Expression

[0-9]

Matches

0

1

2

...

9

Regular Expressions

Expression

`[0-9]{3}-[0-9]{3}-[0-9]{4}`

Matches

123-456-7890

617-555-0100

555-555-5555

...

Regular Expressions

Expression

`.+@.+\. .+`

Matches

`name@example.com`

`person@gmail.com`

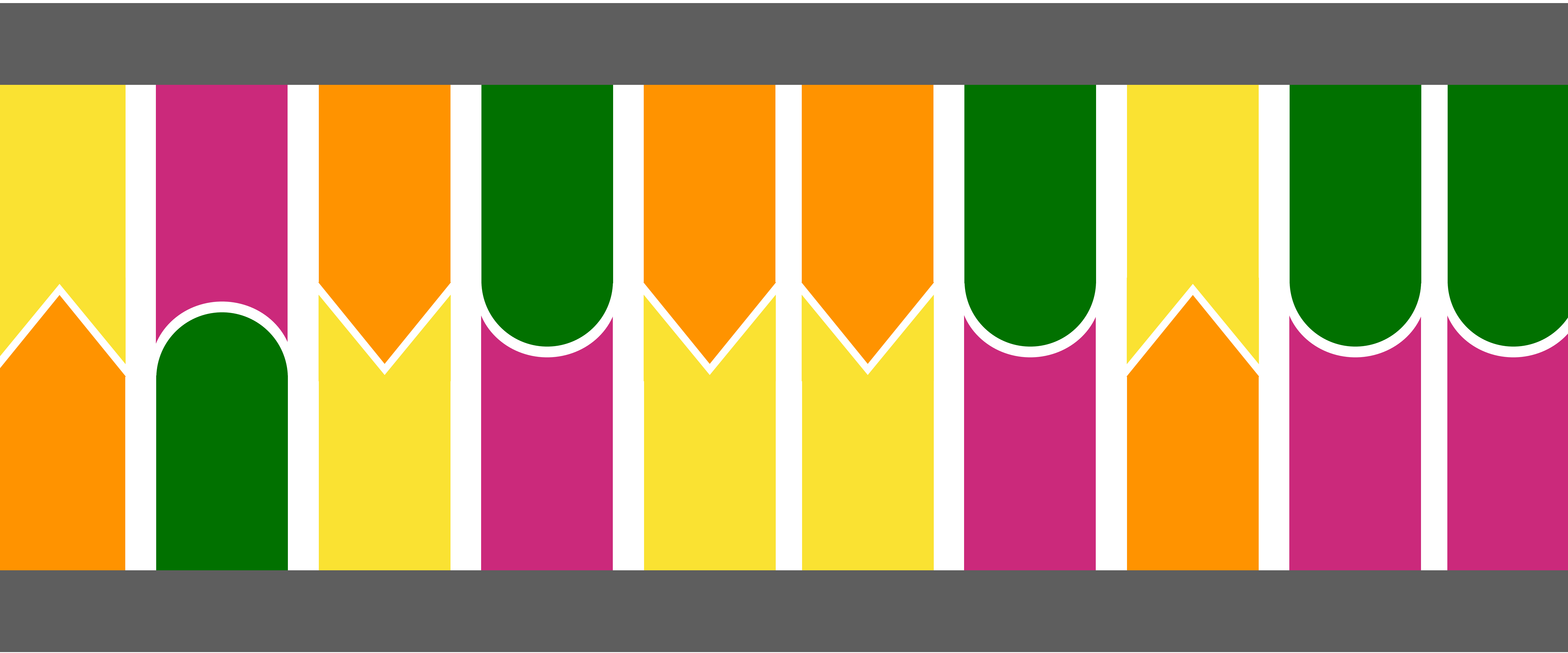
`foo@bar.net`

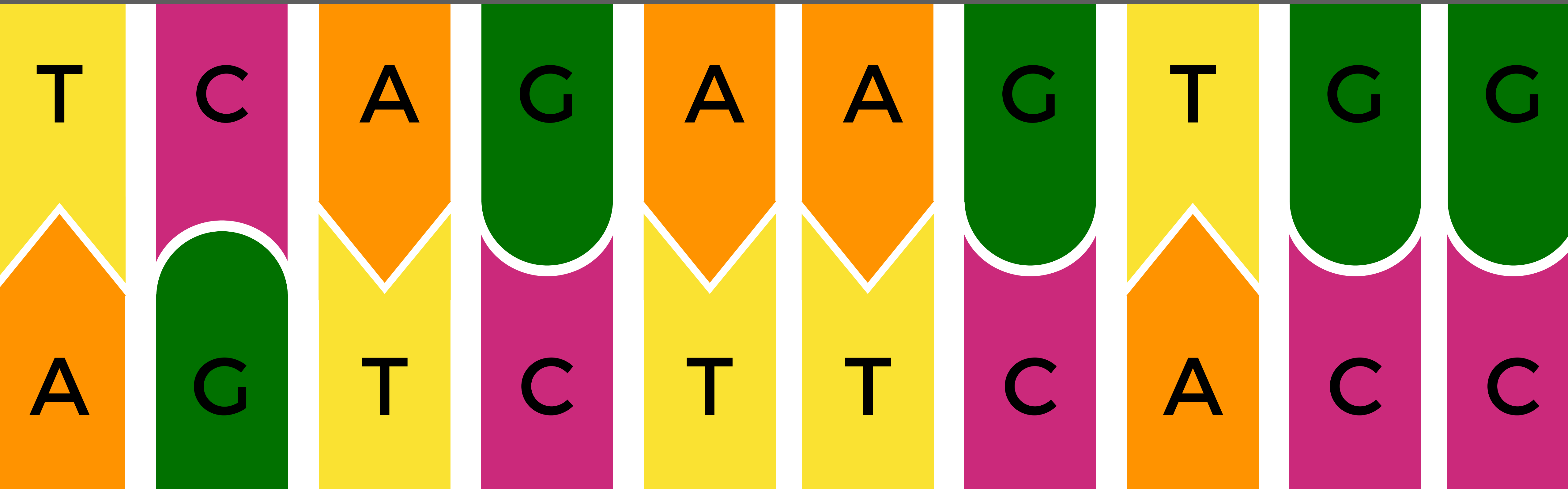
`...`

Problem Set 6

Problem Set 6

- Sentimental
 - Hello
 - Mario (Less) or Mario (More)
 - Cash or Credit
 - Readability
- DNA





T

C

A

G

T C A G A G G A T T T C A G C T C C G A T A C A A C A G T

A G T A G A T A G A T A G A T A G A T A G A T G G A T T T

A G A T

A G T A G A T A G A T A G A T A G A T A G A T G G A T T T

A G A T

A G T A G A T A G A T A G A T A G A T A G A T G G A T T T

A G A T

A G T A G A T A G A T A G A T A G A T A G A T G G A T T T

A G A T

A G T A G A T A G A T A G A T A G A T A G A T G G A T T T

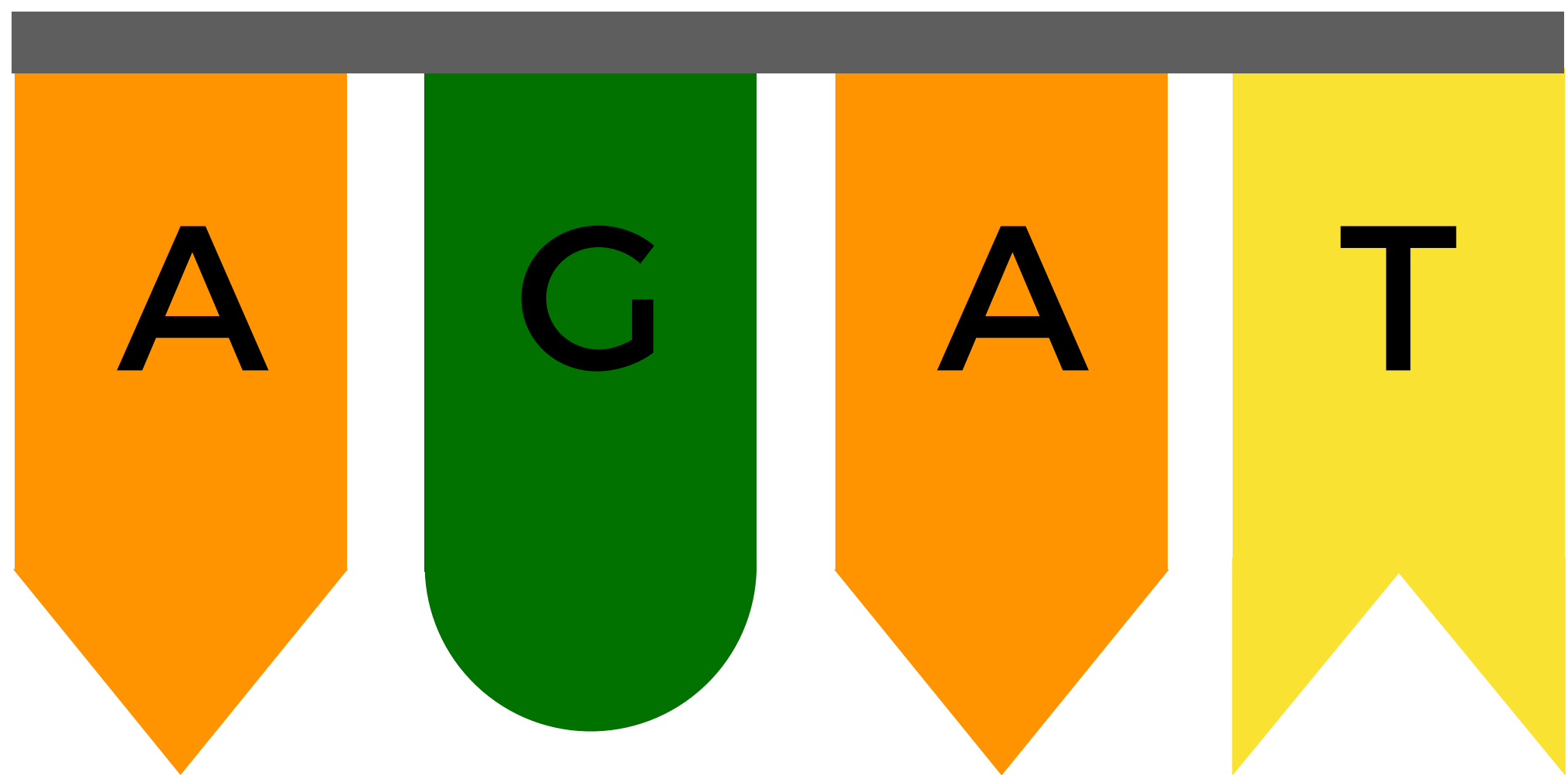
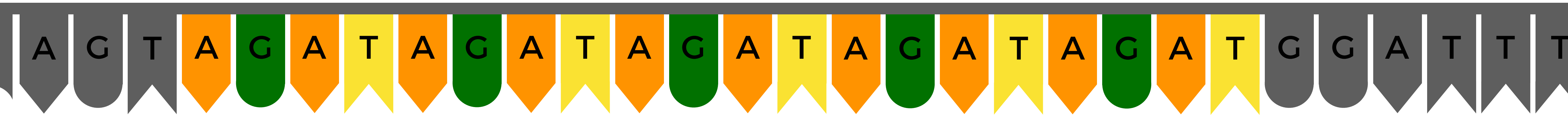
A G A T

A G T A G A T A G A T A G A T A G A T A G A T A G A T A G A T A G A T A G A T A G A T G G A T T T

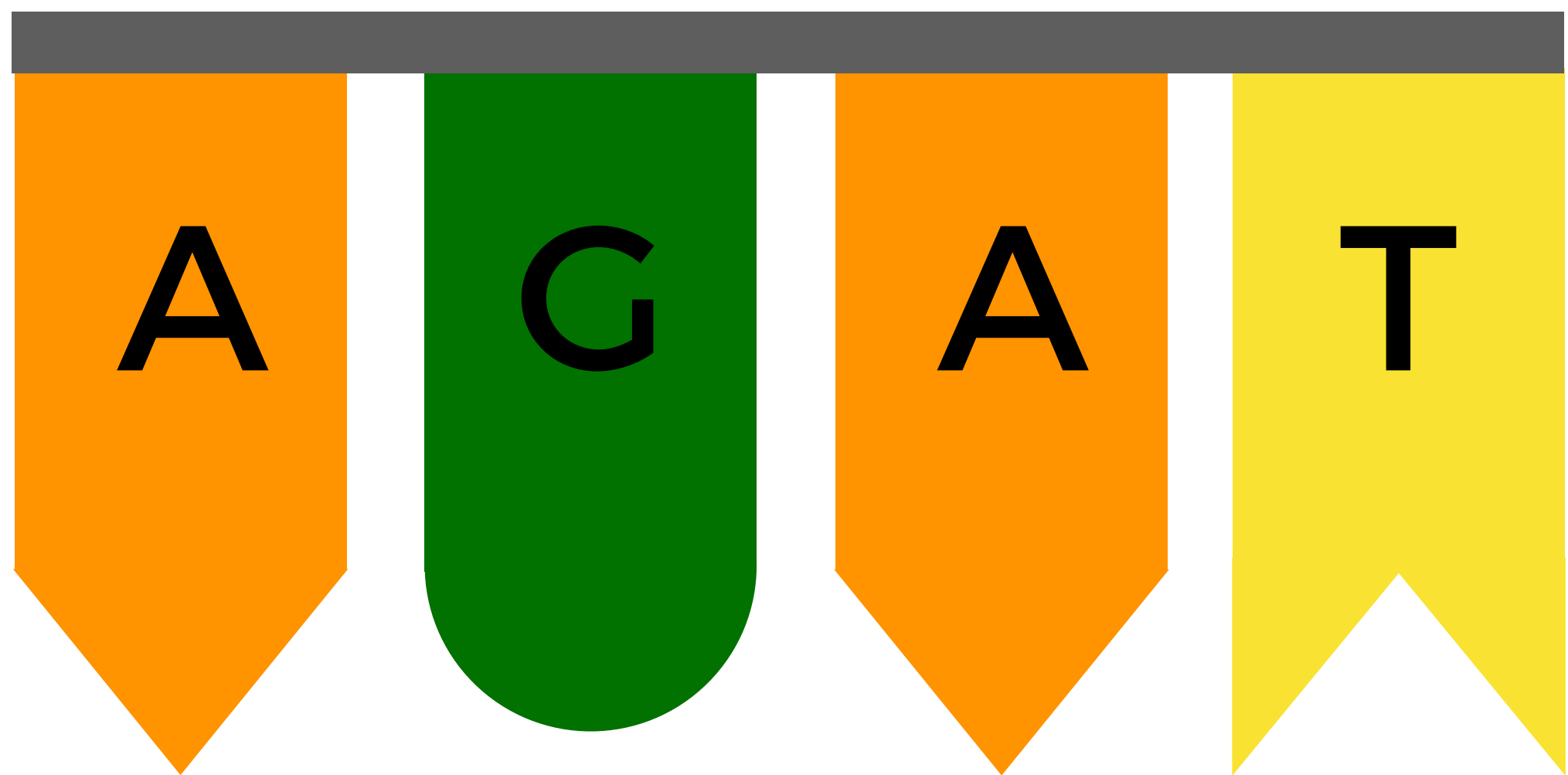
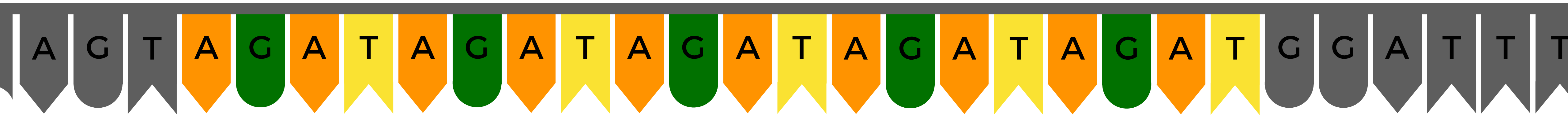
A G A T

A G T A G A T A G A T A G A T A G A T A G A T G G A T T T

A G A T



Short Tandem Repeat



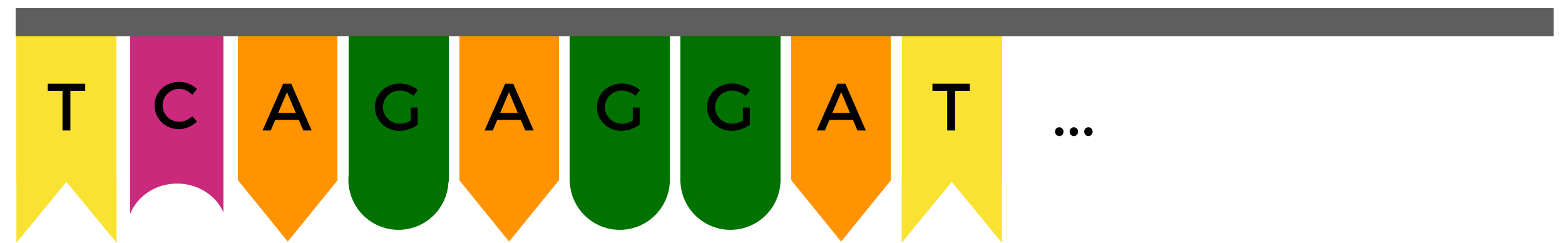
STR

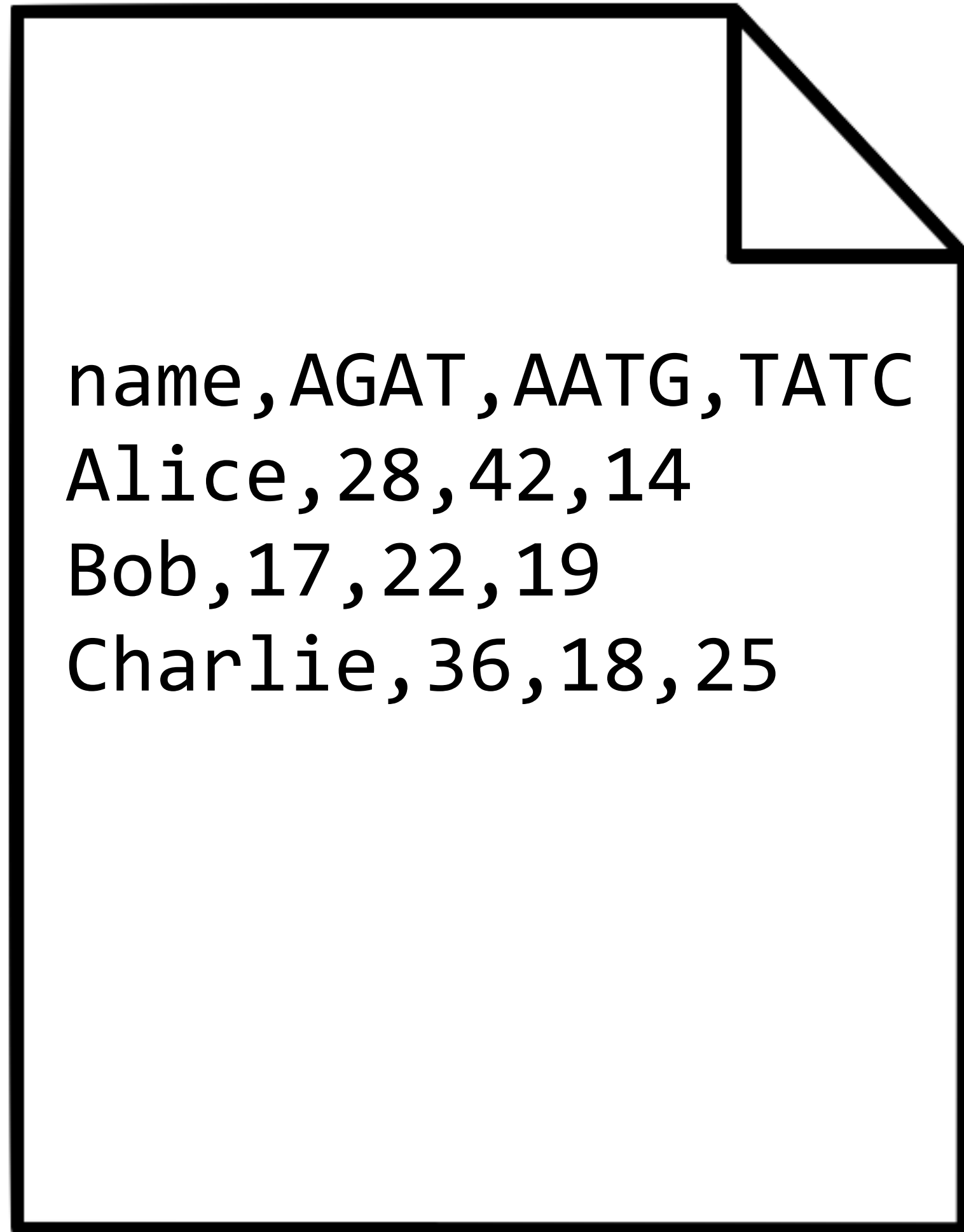
name, AGAT, AATG, TATC
Alice, 28, 42, 14
Bob, 17, 22, 19
Charlie, 36, 18, 25

	AGAT	AATG	TATC
Alice	28	42	14
Bob	17	22	19
Charlie	36	18	25

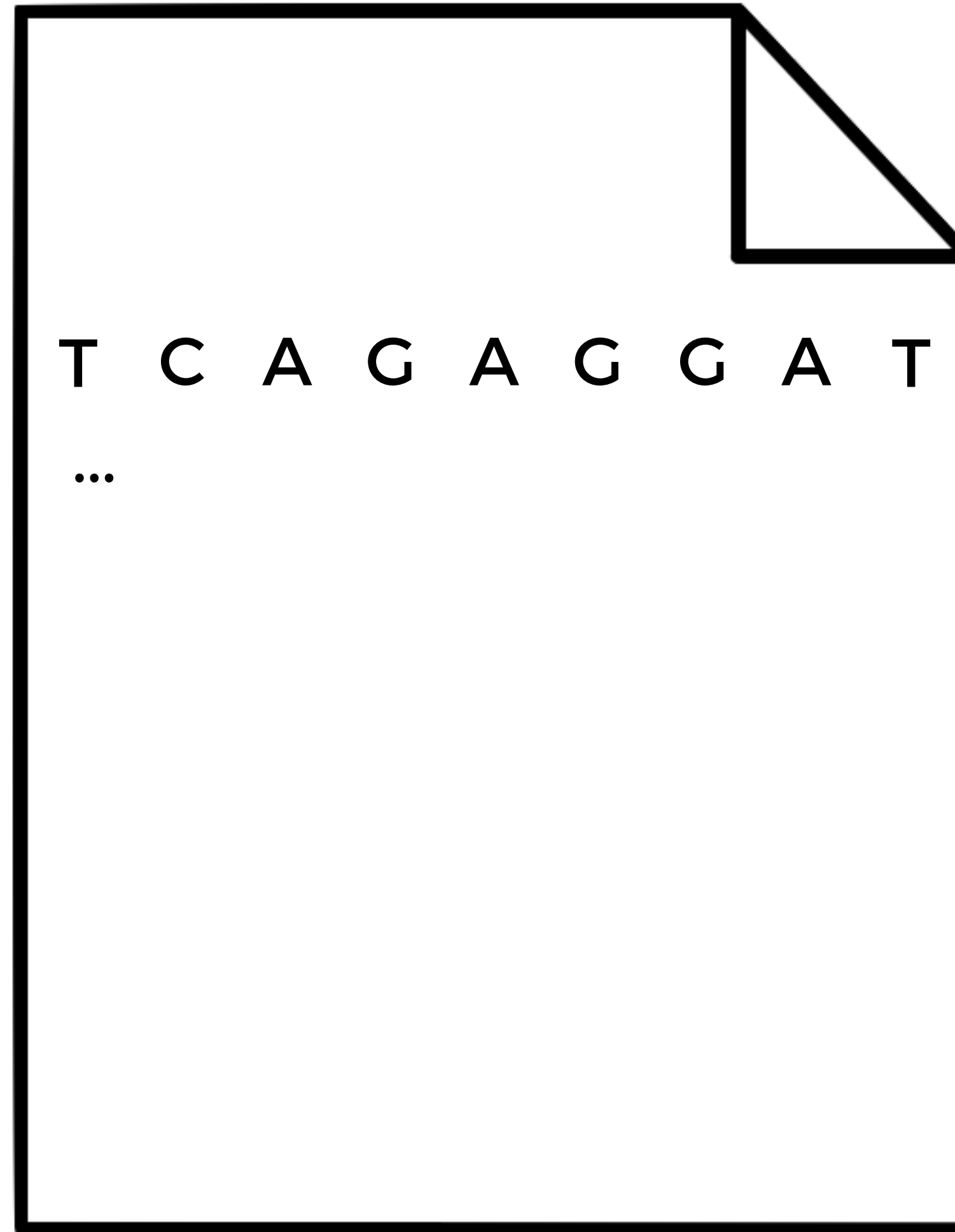
```
name,AGAT,AATG,TATC  
Alice,28,42,14  
Bob,17,22,19  
Charlie,36,18,25
```

data.csv





data.csv



sequence.txt

This is CS50.