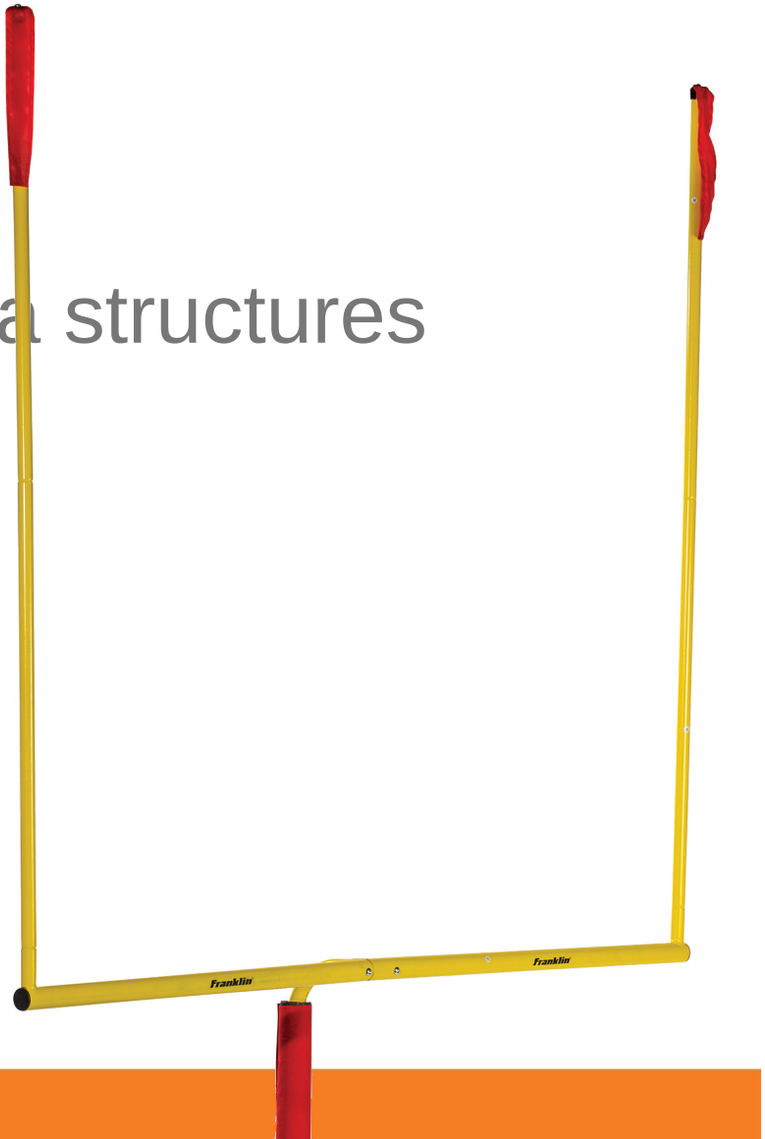
Container Potpourri

Develop Intelligence

Goals

1. Create a Python `set`
2. Create a Python `tuple`
3. Explain the difference between common data structures



Roadmap

1. Sets
2. Tuples
3. Opening Files

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Sets

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Set

- Like a math set
- Unordered
- Unique
- Elements must be immutable

Creating Sets

- Curly braces *{}*

```
colors={'red','red','green','red'}
print(colors)
```

- Constructor:

```
colors=set(['red','red','green','red'])
print(colors)
```

Keyword: `in`

- **Unordered** means you can't use a subscript

```
1 colors=set(['red','red','green','red'])
2 first_one = colors[0] # Error!
```

- Use `in` instead

```
1 colors=set(['red','red','green','red'])
2 has_purple = 'purple' in colors
```

Use a Set When...

- Filter duplicates from a sequence
- Do mathy things
  - Union
  - Intersections

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Tuples

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Tuple

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- Immutable
- Ordered collection
- Heterogeneous data
- Delimited with parenthesis ***()***
    - Or not

```
1 red = (255,0,0)
2 green = (0,255,0)
3 blue = (0,0,255)
4 yellow = 128,128,0 # This works too!
```

Indexing

- Access elements with brackets *[]*
- Zero based
- Negative indexing: relative to the end

```
xs = ('it','is','like','a','weasel')
first_thing = xs[0]
last_thing = xs[-1]

xs[0] = 1200 # Error!
```

Multiple Return Values

- Tuple use case: return more than one value from a function

```
1 def divide(numerator, denominator):
2    quotient = numerator // denominator
3    remainder = numerator % denominator
4    return quotient, remainder
5
6 q,r = divide(13,5)
7
8 print(f'quotient:{q} remainder:{r}')
```

When to use a Tuple

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- Good: Quick and dirty bundle of data
- Bad: No built-in documentation
  - Users have to know what goes where

```
points = [
  (11, 23),
  (4, 12),
]
students = [
  (2339, 'Bloggs', 'Joe', 2291, 11),
  (3991, 'Doe', 'Jane', 12, 8),
]
```

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Opening Files

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Overview

- Use the open function
- Consider things going wrong

Level: Blue Belt

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```
lines = []
for line in open('c:/temp/names.txt'):
  lines.append(line)
return lines
```

Level: Black Belt

```
def get_fortunes(data_file:str)->List[str]:
  """Gets a list of strings from a data file

  Returns:
      List[str]: Fortunes
  """
  fortune_text = ''
  with open(data_file) as reader:
    fortune_text = reader.read()
  return [fortune.strip() for fortune in fortune_text.split('%')]
```

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Review

1. Create a Python `set`
2. Create a Python `tuple`
3. Explain the difference between common data structures