Section Overview

What You Will Learn

- Creating
- Deleting
- Converting
- Assignment
- More built-in functions

Tuples

Tuples

- A tuple is an immutable list.
- Tuples are ordered.
- Values accessed by index.
- Iteration, looping, concatenation.
- Use when data should not change.

```
tuple_name = (item_1, item_2, item_N)
tuple_name = (item_1,)
```

```
days_of_the_week = ('Monday', 'Tuesday', 'Wednesday',
'Thursday', 'Friday', 'Saturday', 'Sunday')
monday = days_of_the_week[0]
print(monday)
print()

for day in days_of_the_week:
    print(day)
```

```
Monday


Monday
Tuesday
Wednesday
```

```
# You cannot modify values in a tuple.
# This will raise an exception.
days_of_the_week[0] = 'New Monday'
```

```
Traceback (most recent call last):
  File "tuples.py", line 3, in <module>
    days_of_the_week[0] = 'New Monday'
TypeError: 'tuple' object does not support
item assignment
```

```
days_of_the_week = ('Monday', 'Tuesday', 'Wednesday',
'Thursday', 'Friday', 'Saturday', 'Sunday')
print(days_of_the_week)
del days_of_the_week
# This will raise an exception as the tuple was deleted.
print(days_of_the_week)
```

```
('Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday',
'Saturday', 'Sunday')
Traceback (most recent call last):
  File "tuples2.py", line 5, in <module>
    print(days_of_the_week)
NameError: name 'days_of_the_week' is not defined
```

Switching between Tuples and Lists

`list()` - Built-in function returns a list.

`tuple()` - Built-in function returns a tuple.

`type()` - Built-in function returns an object's type.

```
weekend_tuple = ('Saturday', 'Sunday')
weekend_list = list(weekend_tuple)
print('weekend_tuple is {}.'.format(type(weekend_tuple)))
print('weekend_list is {}.'.format(type(weekend_list)))
```

```
weekend_tuple is <class 'tuple'>.
weekend_list is <class 'list'>.
```

```
animals_list = ['man', 'bear', 'pig']
animals_tuple = tuple(animals_list)
print('animals_list is {}.'.format(type(animals_list)))
print('animals_tuple is {}.'.format(type(animals_tuple)))
```

```
animals_list is <class 'list'>.
animals_tuple is <class 'tuple'>.
```

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Looping through a Tuple

```
for item_variable in tuple_name:
    # Code block
```

```python
weekend_days = ('Saturday', 'Sunday')
for day in weekend_days:
    print(day)
```

```
Saturday
Sunday
```

```
weekend_days = ('Saturday', 'Sunday')
(sat, sun) = weekend_days
print(sat)
print(sun)
```

```
Saturday
Sunday
```

```python
contact_info = ['555-0123', 'jason@example.com']
(phone, email) = contact_info
print(phone)
print(email)
```

```
555-0123
jason@example.com
```

```python
def high_and_low(numbers):
    """Determine the highest and lowest number"""
    highest = max(numbers)
    lowest = min(numbers)
    return (highest, lowest)

lottery_numbers = [16, 4, 42, 15, 23, 8]
(highest, lowest) = high_and_low(lottery_numbers)
print('The highest number is: {}'.format(highest))
print('The lowest number is: {}'.format(lowest))
```

```
The highest number is: 42
The lowest number is: 4
```

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```
contacts = [('Jason', '555-0123'), ('Carl', '555-0987')]

for (name, phone) in contacts:
    print("{}'s phone number is {}.".format(name, phone))
```

```
Jason's phone number is 555-0123.
Carl's phone number is 555-0987.
```

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Section Summary

Summary

- A tuple is an immutable list, meaning once it is defined the values contained in the tuple cannot be changed.

- Delete a tuple with the del statement.

```
del tuple_name
```

Summary

- Tuples can be converted to lists using the `list()` built-in function.

- Lists can be converted to tuples using the `tuple()` built-in function.

Summary

- You can use tuple assignment to assign values to multiple variables at once.

```
(var_1, var_N) = (value_1, value_N)
```

- Tuple assignment can be used in for loops.

Summary

- The `max()` built-in function returns the largest item that is passed to it.

- The `min()` built-in function returns the smallest item that is passed to it.