# GSET - Intro to Programming with Python

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## Module 3 - Lists

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- Data Stuctures and Programming
- Using Lists in Python
- Common Methods
- Advanced Methods

# Data Stuctures and Programming

There are many ways to store data in the computer.

Q: We have practiced using single values, but how do we store multiple values?

A:

# Data Stuctures and Programming

Common Data Stuctures

| Name | Description |
|---|---|
| Array | |
| *List | |
| Stack | |
| Queue | |
| *Tuple and Sequence | |
| *Set | |
| *Dictionary | |

* Python Data Structures

# Data Stuctures and Programming

Python Data Structures

- List
- Tuple
- Set
- Dictionary

Note: C++ and MATLAB use arrays, but Python does not.

reference: docs.python.org

# Using Lists in Python

## Initializing a List

```
buildings = ['Brown', 'Clement', 'Prescott', 'Bruner']
```

The position of an items in list is the index. Duplicate items are allowed at different indicies.

reference: docs.python.org

# Using Lists in Python

## Accessing Items in a List

```
buildings = ['Brown', 'Clement', 'Prescott', 'Bruner']

print('The north building is', buildings[3])

print('The south building is', buildings[0])
```

The indicies of the list are used to access items. A *slice* of the list can be accessed as well.

ref: some text

# Using Lists in Python

## Redefining Items in a List

```
buildings[3] = 'New Bruner'

print('The CSC department is in', buildings[3])
```

Remember the data in the list is *mutable*, meaning it can be changed after it has been defined.

ref: python.org

# Common Methods

Built-in Functions

- Length - `len(list)` - get the length of list
- Delete - `del(a)` - del the variable a

List Object Methods

- Append - `list.append( x )` - Add item x to end of list
- Insert - `list.insert( x )` - Insert item x at position
- Pop - `list.pop( i )` - Remove and item in list at position i and return it
- Clear - `list.clear( )` - Remove all items from the list

See the full list in the official python tutorial by clicking the link below.
ref: python.org

# Common Methods

## Advanced List Object Methods

- Sort - `list.append( x )` - Add item x to end of list
- Reverse - `list.insert( x )` - Insert item x at position
- Copy - `list.pop( i )` - Remove and item in list at position i and return it

*List Comprehensions* are a very powerful way to iterate through the items in a list.

reference: more info