

# The Data Science Life Cycle

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## 6 Steps

1. Question
2. Collect Data
3. Wrangle Data
4. Analyze Data
5. Visualize Information
6. Communicate Information

Data Science is fluid and does not always have structured steps, rather, you can go to any step needed for answering the question.

# Python Fundamentals

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## Collection Types

Datasets are the collection of data.

### Python's Collection Types:

- Lists
  - Ordered, changeable, duplicates allowed
- Dictionary
  - Ordered, changeable, duplicates not allowed
- Set
  - Unordered, unchangeable, duplicates not allowed
- Tuple
  - Unordered, unchangeable, duplicates allowed

## Representing Datasets with Code

### Column-oriented:

Grouping by features.

```
data = {  
    1: ["A", "C", "E"],  
    2: ["B", "D", "F"]  
}
```

### Row-oriented:

Grouping by a single observation.

```
data = {  
    "A": ["C", "E"],  
    "B": ["D", "F"]  
}
```

## Indexing

In order to access values, we must index into it.

- List
  - name[index]
- Set
  - name[key]
- Dictionary
  - For Loop
- Tuple
  - name[index]

# Iteration

## Python Loop Types:

- While Loop
- For Loop

```
while condition:  
    statements
```

```
for thing in collection:  
    statements
```