**The need that originally motivated the discipline of computer science, and some of the repercussions of that need which make it a valid field of study.**

**Be able to define the following terms:**

**Abstraction:** encapsulating multiple program elements, naming the encapsulated entity, and defining the interface.

**Encapsulation:** the process of combining elements to create a new entity.

**Interface:** A boundary across which two independent systems meet and act on or communicate with each other.

**Information Hiding:** In programming, the process of hiding details of an [object](http://www.webopedia.com/TERM/O/object.html) or [function](http://www.webopedia.com/TERM/F/function.html)

**Client:** Typically, a client is an [application](http://www.webopedia.com/TERM/A/application.html) that runs on a [personal computer](http://www.webopedia.com/TERM/P/personal_computer.html) or [workstation](http://www.webopedia.com/TERM/W/workstation.html) and relies on a [server](http://www.webopedia.com/TERM/S/server.html) to perform some operations

**Mutable:** things that can be changed.

**Immutable:** things that cant be changed.

**Keyed:**

**Be able to describe what abstraction means to the software professional**

encapsulating multiple program elements, naming the encapsulated entity, and defining the interface.

**Be able to describe primitive and built-in data types of python, and to answer questions about the operations on them**

1. Primitive
   1. Bool
   2. Int
   3. Float
   4. Complex
2. Built in
   1. Immutable
      1. Tuple
      2. Str
      3. Bytes
   2. Mutable
      1. Set
      2. List
      3. Dict
      4. bytearray

**Be able to describe what is meant by a keyed collection and to say what data structures in Python are keyed collections**

**Be able to specify the uses and effects of the Python operators and to use them in natural ways, taking into account their precedence.**

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**Be able to describe what is meant by a keyed collection and to say what data structures in Python are keyed collections.**

Data can be passed into a workflow using a dictionary of input parameters, arranged by argument name, that map to the input arguments of the workflow . Set and dict are keyed, not subscripted in the ordinary sense.

**Be able to specify the uses and effects of the built-in python data structures (collections) and to use them in natural ways.**

List

Bytearray

Tuple

Set

Dict

**Be able to use Python subscripting and slicing.**

**Be able to take advantage of Python tuple assignment.**

**Be able to classify Python data types as mutable or immutable, and to demonstrate what is meant by those terms.**

1. Primitive
   1. Bool
   2. Int
   3. Float
   4. Complex
2. Built in
   1. Immutable
      1. Tuple
      2. Str
      3. Bytes
   2. Mutable
      1. Set
      2. List
      3. Dict
      4. bytearray