MODULE 2

BASIC DATA STRUCTURES

What is a data structure?

Very simply – a way to store data.

List – a list of items (generally) of the same type

Dictionary – Key value pairs

Can contain virtually any type of data,

Arrays and maps are very common in coding

w	o	r	d

Array

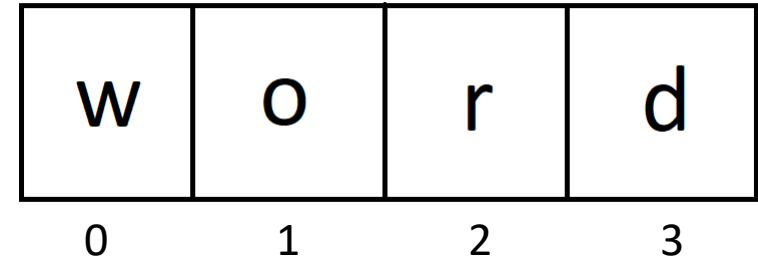| Key	Value
April	30
May	31
June	30
July	31

Map

Lists

Lists (also known as arrays) are one of the simpler and more common data types used in coding.

Index – the number representing position within the array

Length/Size – the number of items

Format is like: [value, value … , value]

w	o	r	d
0	1	2	3

Dictionaries

Dictionaries – (also known as Maps) are sets of key value pairs

Keys are unique, you can't have two of the same

Values can be anything

Format is like: { key:value , key:value … , key:value}

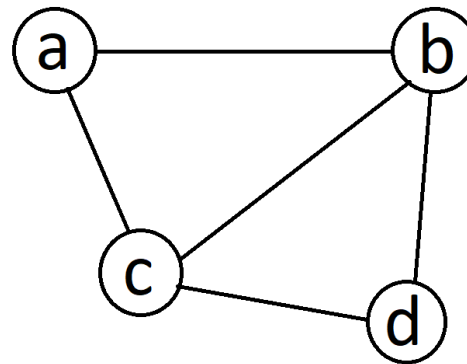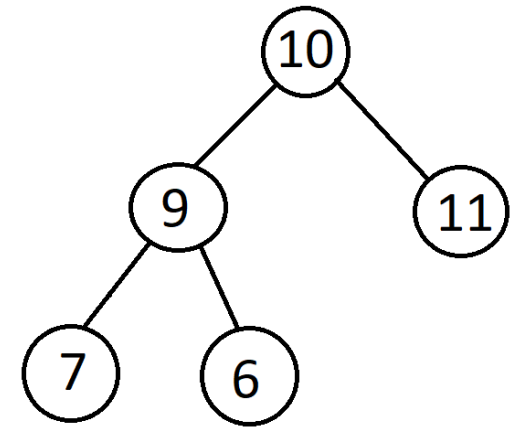| Key	Value
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Advanced Data Types

There are many varieties besides arrays and maps here are a few:

Linked List – Nodes connected like an array

Stack / Queue – First in last out / last in first out

Tree – Nodes with parent and child nodes

Graph – Nodes and edges

Try it out

1. Create a list that has the letters of "Hello World"

    Add a ! to the end of the array.

2. Create a dictionary that keys month abbreviations to the full names

3. Create an array of dictionaries that represents the vertices of a triangle.

    use python to find the area of that triangle

    Hint: the area of a triangle ABC is

$$area = \left| \frac{A_x(B_y - C_y) + B_x(C_y - A_y) + C_x(A_y - B_y)}{2} \right|$$