Lecture: 23-1

- Prerequisites for this lecture are: 22-1, 22-2 and 22-3.

Implementing an array datatype in Python

- python has a number of builtin data types: strings, lists, dictionaries, float, int
  - noticable by its absense is the array data type

- this datatype would be useful in touchmap to maintain a grid of buttons and a grid of the characters to be exported

Implementing an array datatype in Python

- it is possible to build an array datatype from a class (and a number of lists)

array2d.py

- `array2d.py` implements a very simple 2D array in Python
- and is used by `touchmap.py` to create `cell_array` and `button_array`
- **`$HOME/Sandpit/touchmap-0.2/array2d.py`**

```
#  the contents will be written to the file and is the complete 2D map
cell_array = array2d (0, 0, " ")
#  contains just the 2D array of cells (buttons) visible on the tablet
button_array = array2d (0, 0, [None])
```

array2d.py

- `array2d` takes three parameters the initial size of the array `x` and `y` and lastly the default element value which must be a list

- `array2d` is implemented as a class and has a number of public methods
  - `set_contents` set array [x, y] to value
  - `get` get value held at position, [x, y]
  - `high` return the maximum indices in the 2d array
  - `inRange` return True if, x, y can index into the array.

array2d.py

- the array will dynamically grow to fit an assigned value
- for example
- ```
  cell_array = array2d (0, 0, " ")

  cell_contents.set_contents (4, 2, "a")
  ```
- will create `cell_array`
  - and then store `a` at index `4,2` having grown the `cell_array` from entry `0,0` up to but not including entry `4,2` with spaces
  ```

array2d.py

- remember that a string is a list of characters in Python
- which is why the button array is declared using
-

```
button_array = array2d (0, 0, [None])
```