MATLAB

Indices

Accessing elements

```
>> block
 10    20    30    40
110   120   130   140
210   220   230   240
```

10	20	30	40
110	120	130	140
210	220	230	240

Indices

Indices can be used to extract values from within a matrix. An index gives the position(s) from which to get the values.

10	20	30	40
110	120	130	140
210	220	230	240

Accessing elements

```
>> block(1,2)
```

DIM: 2 →

DIM 1 ↓

10	20	30	40
110	120	130	140
210	220	230	240


```
>> block(1:3, 1:2)
 10    20
110   120
210   220
```

1:2 →

1:3 ↓

10	20	30	40
110	120	130	140
210	220	230	240

Indices

Indices can be also be used to select cells within matrices, to which to assign values.

10	20	30	40
110	120	130	140
210	220	230	240

Assign values to ranges

```
>> block(2,2:3) = 0;
```

2:3

10	20	30	40
110	0	0	140
210	220	230	240

2

Indices

Indices can be used to grab or copy whole sections of a matrix for some other purpose.

10	20	30	40
110	0	0	140
210	220	230	240

Making small copies

```
>> smallBlock = block(1:3,1:2);
```

1:2

1:3

10	20	30	40
110	0	0	140
210	220	230	240

Arrays as indices

Rather than hard-coding the positions, you can use an array to select positions.

10	20	30	40
110	0	0	140
210	220	230	240

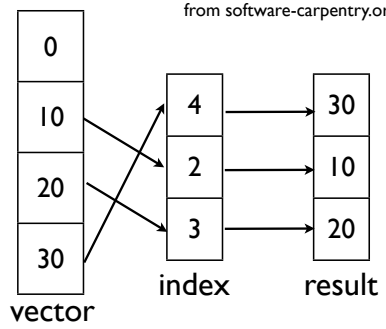
Arrays as indices

from software-carpentry.org

```
>> vector = [0, 10, 20, 30];
>> index = [4, 2 , 3];
>> vector( index )
[30, 10, 20]
```


Arrays as indices

from software-carpentry.org



Review

- Indices are used to select positions within matrices (or vectors). They can be used to
  - Extract data from a matrix
  - Select positions to which to assign values
  - Identify subsets of a matrix
- Arrays can be used as indices