Nitty-gritty of Data and Exploratory Analysis with Python 3

Dev Skill
Class 7

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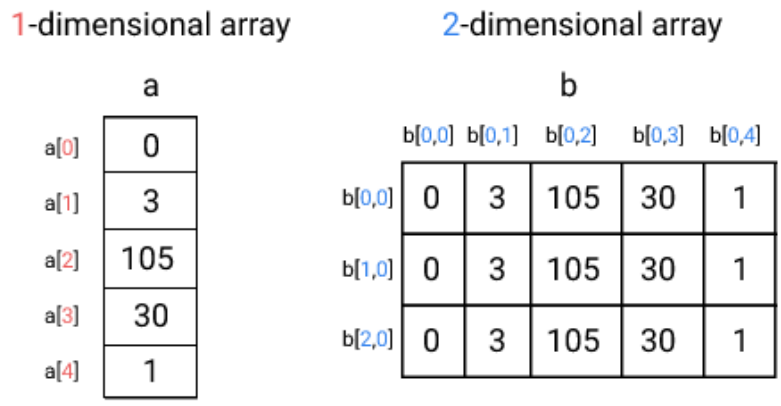
Data Analytics:

There are many tools available for data analytics in Python. In this course we will mainly focused on Numpy and Pandas.

Numpy:

The core data structure in NumPy is the ndarray object, which stands for N-dimensional array. An array is a collection of values, similar to a list. N-dimensional refers to the number of indices needed to select individual values from the object.



Each value in a NumPy array has to have the same data type. NumPy data types are similar to Python data types, but have slight differences. You can find a full list of NumPy data types here. Here are some of the common ones:

- bool: Boolean.
  - ✓ Can be True or False.
- int: Integer values.

- ✓ Can be int16, int32, or int64. The suffix 16, 32, or 64indicates the number of bits.

➢ float: Floating point values.
- ✓ Can be float16, float32, or float64. The suffix 16, 32, or 64 indicates how many numbers after the decimal point the number can have.

➢ string: String values.
- ✓ Can be string or unicode, which are two different ways a computer can store text.

NumPy will automatically figure out an appropriate data type when reading in data or converting lists to arrays. You can check the data type of a NumPy array using the dtype property.

Matrix:

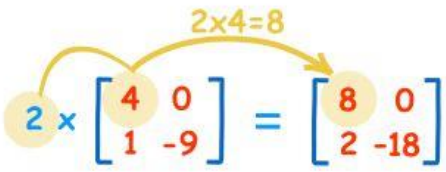
In mathematics, a matrix (plural: matrices) is a rectangular array of numbers, symbols, or expressions, arranged in rows and columns. For example, the dimension of the matrix below is 2 × 3 (read "two by three"), because there are two rows and three columns:

$$\begin{bmatrix} 6 & 4 & 24 \\ 1 & -9 & 8 \end{bmatrix}$$

A Matrix
(This one has 2 Rows and 3 Columns)

Matrix Multiplication:

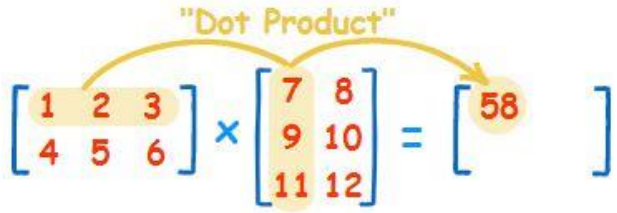
Multiply a matrix by a single number or **Scaler Multiplication**:



These are the calculations:

2×4=8	2×0=0
2×1=2	2×-9=-18

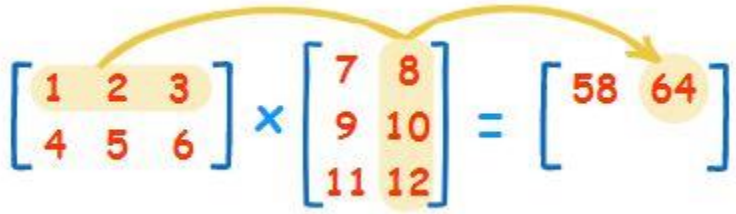
Multiplying a Matrix by another Matrix or **Dot Product**:

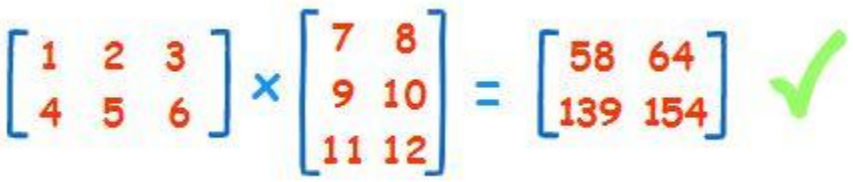


The "Dot Product" is where we **multiply matching members**, then sum up:

$$(1, 2, 3) \bullet (7, 9, 11) = 1\times7 + 2\times9 + 3\times11$$
$$= 58$$

We match the 1st members (1 and 7), multiply them, likewise for the 2nd members (2 and 9) and the 3rd members (3 and 11), and finally sum them up.





Exercise:

Apple costs $3 each
Cherry costs $4 each
Blueberry costs $2 each.

4 days item sales count as bellow –

	Mon	Tue	Wed	Thu
Apple	**13**	**9**	**7**	**15**
Cherry	**8**	**7**	**4**	**6**
Blueberry	**6**	**4**	**0**	**3**

Use Matrix multiplication and find out Day wise total sales amount.