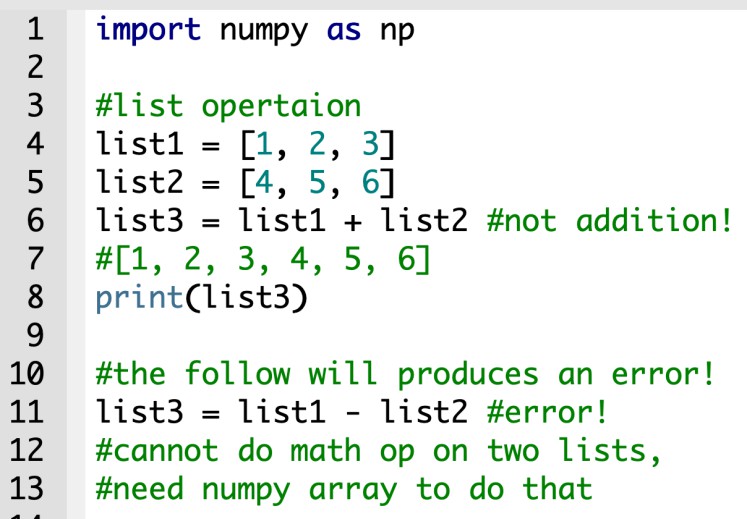
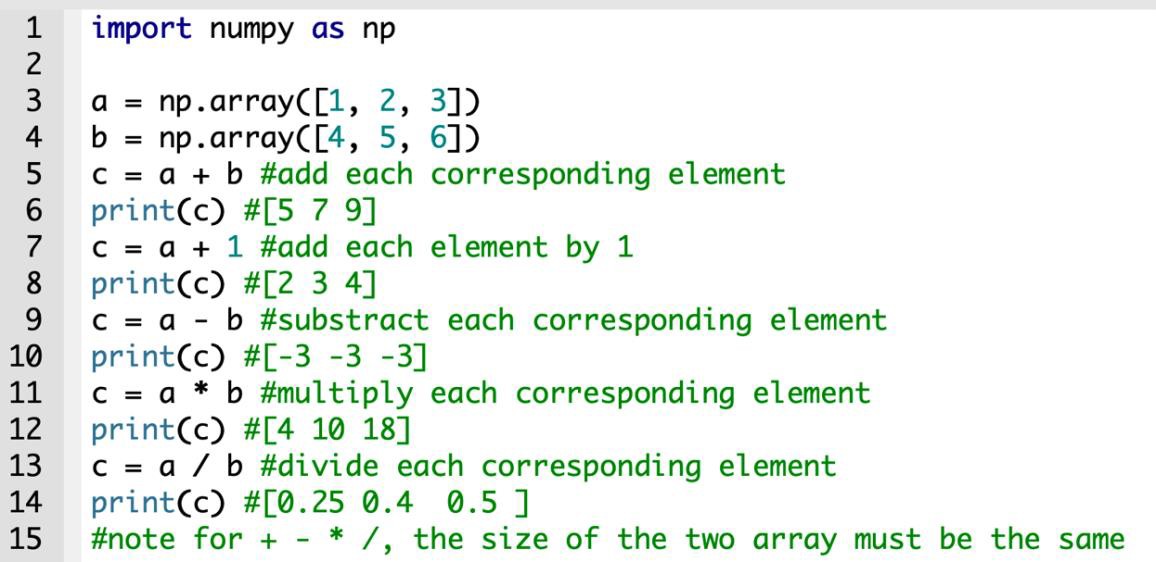
Lesson 3b worksheets – Numpy array manipulation

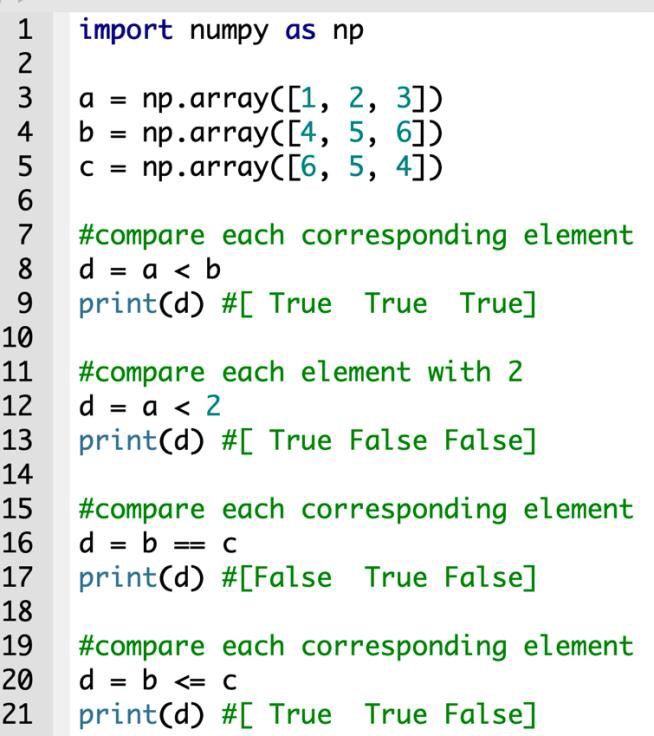
1. List manipulation

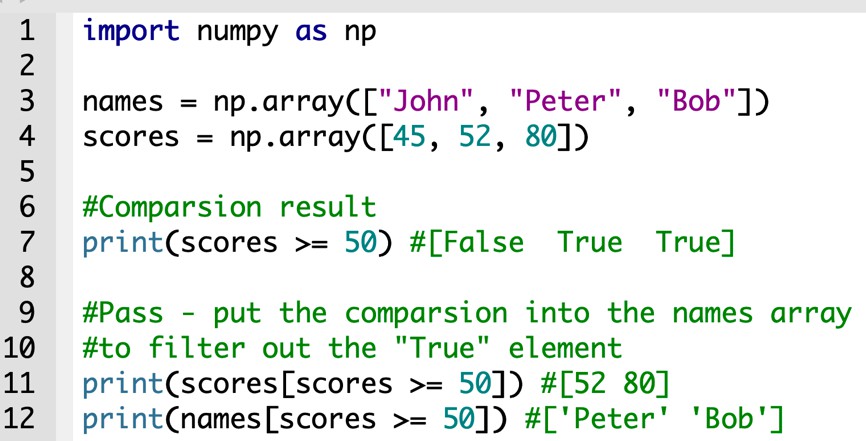
* List is useful but is unable to do mathematic calculation.

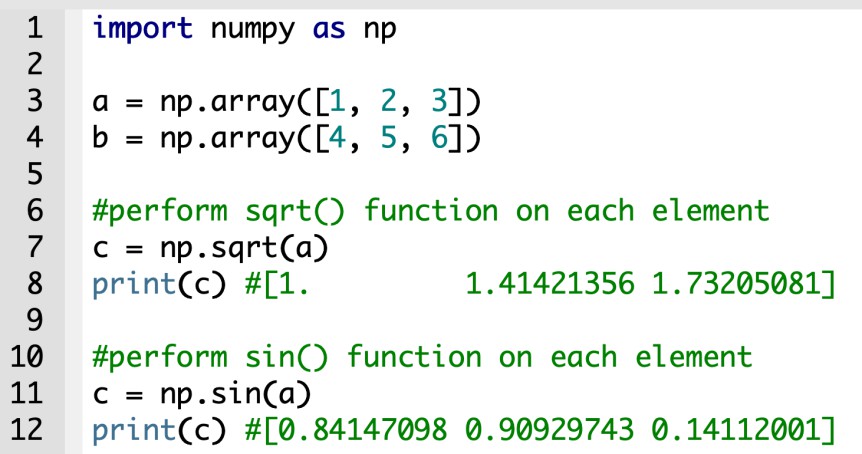
1. Basic numpy array Arithmetic operations.

* Arithmetic operations are carried out on each element of an array.

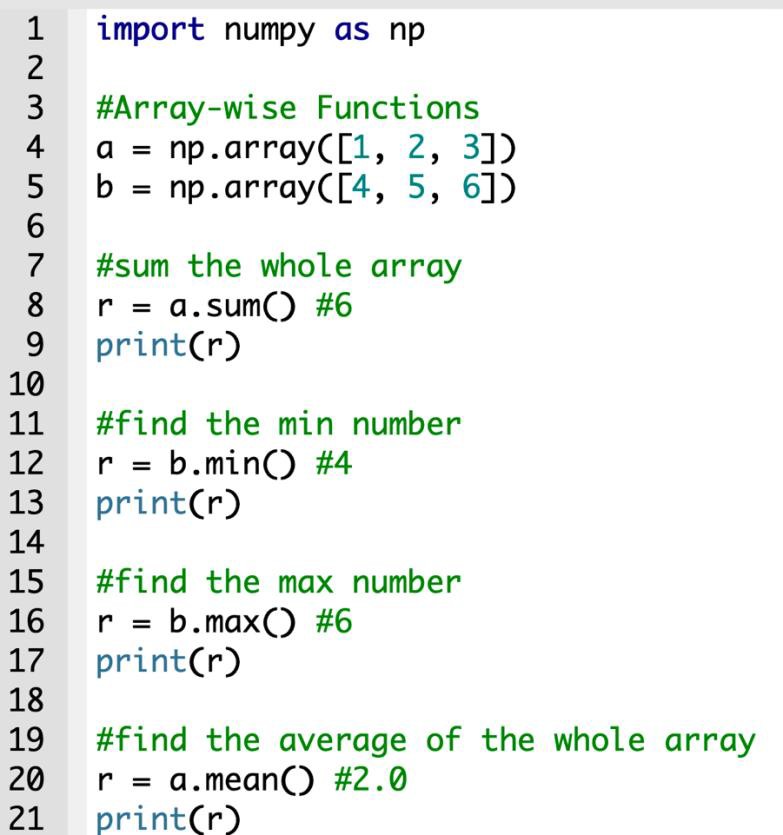
1. Comparisons

* Do element-wise comparisons of values using <, <=, >, >=, ==, !=
* Result is a Boolean array.

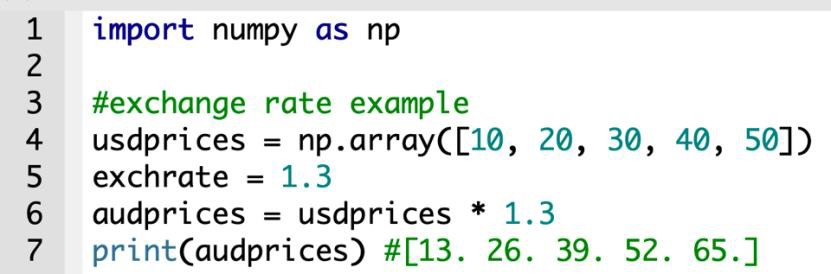
1. Filtering using numpy array comparison.
   * A very powerful feature in numpy array.
   * Use the results of comparison to filter out the data we want.
   * Assume we have two arrays; one array stores the name and one array store the score. Each array element data is corresponding (e.g. John – 45, Peter – 52 and Bob – 80)
   * We want to filter out the scores and names that pass (i.e. score >= 50)
2. Element-wise Functions

* Carry out mathematic functions on each element of an array.

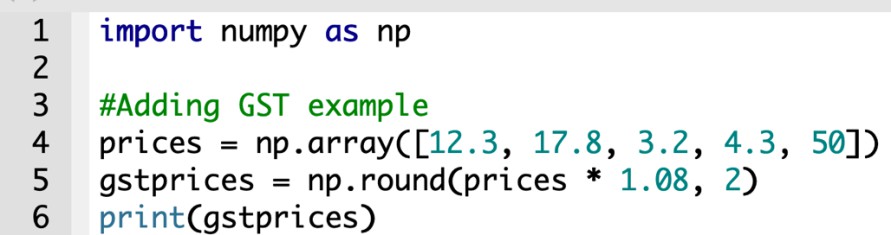
1. Array-wise Functions

* Carry out mathematic functions on the whole array.
* Some examples are: sum(), min(), max() and mean().

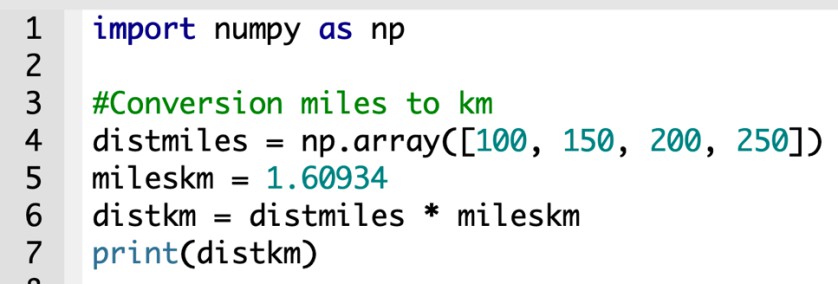
1. Exchange rate example

* Convert the array of USD to AUD.

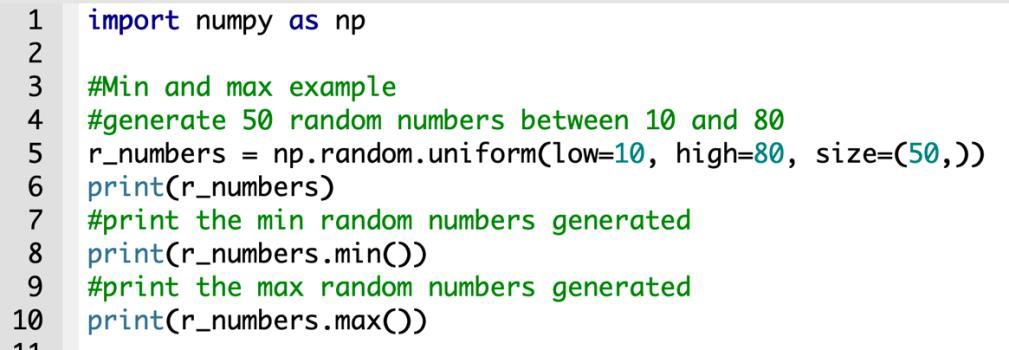
1. Adding GST example

* Add GST to the price of each item.

1. Conversion miles to km example

* Convert each mile to km.

1. Min and Max example

* Generate 50 random numbers between 10 and 80.
* print the min and max random numbers generated.