1 Question E2.1

- Example 1:

  input : `v = [1, 1, 2, 3, 4, 3]`
  output : `The unique values in v are: [1, 2, 3, 4]`

- Example 2:

  input : `v = [1, 5, -1, 20, 4.5, 5, 20]`
  output : `The unique values in v are: [1, 5, -1, 20, 4.5]`

- Example 3:

  input : `v = [1, 1, 1, 1, 1, 1]`
  output : `The unique values in v are: [1]`

2 Question E2.2

- Example 1:

  input : `v = [1, 2, 1, 5, 2]`, `n = 2`
  output : `The new vector is: [-1, 1, -1, -1, 1]`

- Example 2:

  input : `v = [1, 2]`, `n = 3`
  output : `The new vector is: [-1, -1]`

- Example 3:

  input : `v = [5, 5, 5, 5, 5]`, `n = 5`
  output : `The new vector is: [1, 1, 1, 1, 1]`

3 Question E2.3

- Example 1:

  input : `w = [2, 1, 30]`, `x = [3, 4]`
  output : `The sign dot is 1`

- Example 2:

  input : `w = [50, 10, 20]`, `x = [-4, -6]`
  output : `The sign dot is -1`

- Example 3:

  input : `w = [1, 2, 3]`, `x = [-3, -2]`
  output : `The new vector is: [1, 1, 1, 1, 1]`

4 Question E2.4

input : `M = np.array([[5, 3, 1], [4, 9, 5], [3, 6, 9]])`

output : (first part)
```
The max values are [5 8 9]
The min values are [3 3 1]
```

output : (second part)
```
The max indexes are [0 2 2]
The min indexes are [2 0 0]
```

output : (third part)
```
The averages of the columns are [4.  6.  5.]
The sums of the columns are [12 18 15]
```

5 Question E2.5

- Example 1:

  input : `v = [0, 1, 2, 1], m = 3`

  output :
  ```
  [[1.  0.  0.  0.]
   [0.  1.  0.  1.]
   [0.  0.  1.  0.]]
  ```

- Example 2:

  input : `v = [3, 3, 1, 1], m = 4`

  output :
  ```
  [[0.  0.  0.  0.]
   [0.  0.  1.  1.]
   [0.  0.  0.  0.]
   [1.  1.  0.  0.]]
  ```

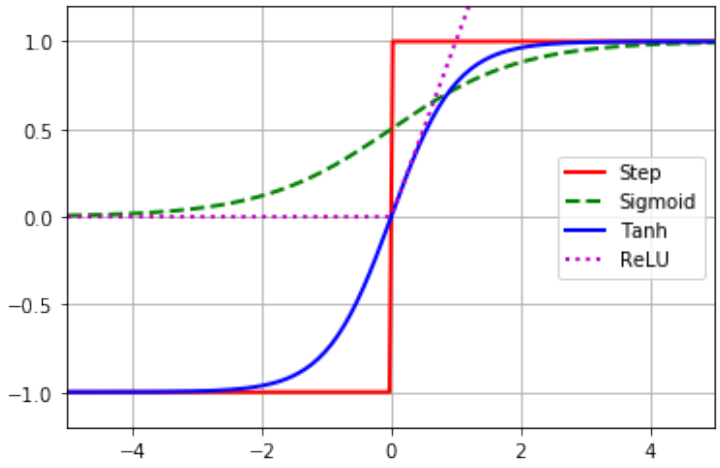
- Example 3:

  input : `v = [3, 3, 1, 1, 0, 0, 1, 2, 3], m = 4`

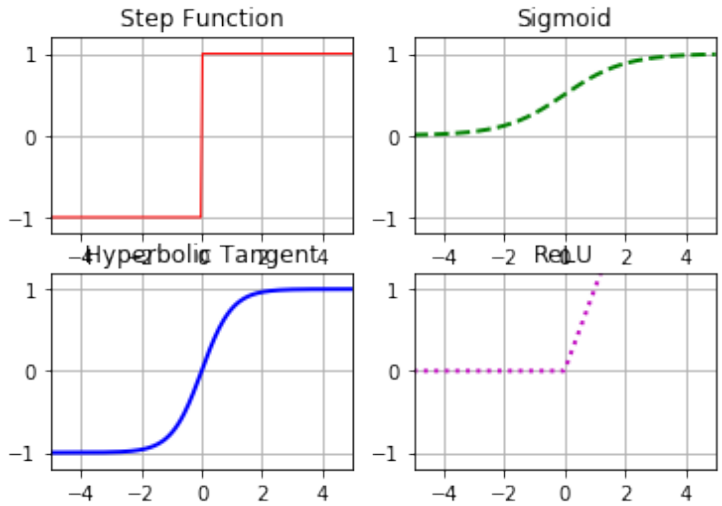
  output :
  ```
  [[0.  0.  0.  0.  1.  1.  0.  0.  0.]
   [0.  0.  1.  1.  0.  0.  1.  0.  0.]
   [0.  0.  0.  0.  0.  0.  0.  1.  0.]
   [1.  1.  0.  0.  0.  0.  0.  0.  1.]]
  ```

6 Question E2.6

output : (first part)



output : (second part)



7 Question E2.7

- Example 1: (first part)

  input : `v = np.array([1, 2, 3, 4])`

  output : `[0.0320586 0.08714432 0.23688282 0.64391426]`

  (second part)

  input : `A = np.array([[1, 10, 1, 10], [10, 1, 10, 10], [1, 1, 10, 10]]))`

  output :
  ```
  [[1.23379352e-04 9.99753241e-01 6.17010948e-05 3.33333333e-01]
   [9.99753241e-01 1.23379352e-04 4.99969149e-01 3.33333333e-01]
   [1.23379352e-04 1.23379352e-04 4.99969149e-01 3.33333333e-01]]
  ```