- Submit one *ipynb* file. The solution to each problem must be in a separate cell.

- Your code must run on Colab.

- You have to submit your own solutions but you may use other resources to help you such as collaborating with your classmates, searching the Internet for clues etc.

1). Write a python function that takes a sequence of numbers and determines if all the numbers are distinct from each other or if there are any duplicates.

```
def test_distinct(data):
    # Your code goes here ...

print(test_distinct([1,5,7,9]))
print(test_distinct([2,4,5,5,7,9]))
```

Expected output:

```
True
False
```


2). Write a python function to find indices of elements that are equal to zero in a numpy array.

```
def zero_index(numpy_array):
    # Your code goes here ...

import numpy as np
zero_index(np.array([1,0,2,0,3,0,4,5,6,7,8]))
```

Expected output:

```
[1 3 5]
```


3). Write a program to compute and print the Mean Squared Error (MSE)..

$$MSE = \frac{1}{m} \sum_{i=1}^{m} (w_0 + w_1 x_i - y_i)^2$$

Where

$$\mathbf{w}^T = [w_0 \quad w_1] = [0.25 \quad 0.75]$$

$$\mathbf{x}^T = [x_1 \quad x_2 \quad x_3 \quad x_4 \quad x_5] = [100 \quad 200 \quad 300 \quad 400 \quad 500]$$

$$\mathbf{y}^T = [y_1 \quad y_2 \quad y_3 \quad y_4 \quad y_4] = [65 \quad 155 \quad 220 \quad 310 \quad 370]$$