14/10/25 **PYTHON**

NumPy library:

- It's a python library used for numerical computations, especially with large multi-dimensional array and matrices.
- It also provides many mathematical, logical and statistical operations.
- To install NumPy: !pip install NumPy.
- To create 1D array: a1=np.array([1,2,3])
- To create 2D array: np.array([[1,2],[3,4]])
- To create 3D array: np.array([1,2,3],ndim=3)
- To create 4D array: np.array([1,2,3],ndim=4)
- To check no. of elements in array: a1.size
- To check how many rows and cols are present: a1.shape
- To check dtype off array element: a1.dtype
- To check array datatype: type(a1): numpy.ndarray
- To reshape the row: arr.reshape(3,1)
- To get 0's matrix: np.zeros((3,3),dtype=int)
- To get 1's matrix: np.ones((2,2), dtype=int)
- To get identical matrix: np.identity(2, dtype=int) or np.eye(2,dtype=int)
- To get a range of matrix: np.arange(1,10,1) [It prints btwn 1-9]
- To get 3X3 matrix: np.arange(1,10,1).reshape(3,3)
- To get random matrix: np.random.rand(2,2) [rand () will always give values btwn 0-1)
- To get values of our preference: np.random.randint(10,20,(3,3))
- To get full matrix: np.full((2,4),3)
- To get empty matrix: np.empty((2,2,), dtype=int) [it gives garbage collected values]
- To get linspace matrix: np.linspace(1,2,5) [line space diff. btwn 2 val shd be same]
- Universal functions:
- Sqrt: np.sqrt(a)
- Exp: np.exp(a)
- Log: np.log(a)
- Sin: np.sin(a)
- Mean: np.mean(a)
- Median: np.median(a)
- Std: np.std(a)

- To reshape an array: a.reshape(4,3) :o/p: array([[1,2,3],
  [4,5,6],
  [7,8,9],
  [10,11,12]])
- The above eg gives 2D matrix but I need only 1D matrix:arr.reshape(12)
- Or arr.flatten('f') [f-flatten in col major]
- To merge horizontal rows: np.hstack((a1,a2))
- To merge vertical cols: np.vstack((a1,a2))
- To perform matrix multiplication: np.matmul(mat1,mat2)
- Or using operator (@) : mat1@mat2
- In pandas to convert object in numerical datatype:
  pd.to_numeric ()
  if you have error value then u have to give error='coerce'
  null is represented by NaN