

ASSIGNMENT 2-SVD

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Problem Statement:

Apply Singular value decomposition on the iris dataset for dimensionality reduction.


	sepal_len	sepal_wid	petal_len	petal_wid	class
0	5.1	3.5	1.4	0.2	Iris-setosa
1	4.9	3.0	1.4	0.2	Iris-setosa
2	4.7	3.2	1.3	0.2	Iris-setosa
3	4.6	3.1	1.5	0.2	Iris-setosa
4	5.0	3.6	1.4	0.2	Iris-setosa
5	5.4	3.9	1.7	0.4	Iris-setosa
6	4.6	3.4	1.4	0.3	Iris-setosa
7	5.0	3.4	1.5	0.2	Iris-setosa
8	4.4	2.9	1.4	0.2	Iris-setosa
9	4.9	3.1	1.5	0.1	Iris-setosa
10	5.4	3.7	1.5	0.2	Iris-setosa

Eigenvectors


```
[[ 0.52237162 -0.37231836 -0.72101681  0.26199559]
 [-0.26335492 -0.92555649  0.24203288 -0.12413481]
 [ 0.58125401 -0.02109478  0.14089226 -0.80115427]
 [ 0.56561105 -0.06541577  0.6338014  0.52354627]]
```

Eigenvalues


```
[2.91081808 0.92122093 0.14735328 0.02060771]
```

In [30]:  u

```
Out[30]: array([[ -0.52237162, -0.37231836,  0.72101681,  0.26199559],
 [ 0.26335492, -0.92555649, -0.24203288, -0.12413481],
 [-0.58125401, -0.02109478, -0.14089226, -0.80115427],
 [-0.56561105, -0.06541577, -0.6338014 ,  0.52354627]])
```

In [31]:  s

```
Out[31]: array([20.89551896, 11.75513248,  4.7013819 ,  1.75816839])
```

In [32]:  v

```
Out[32]: array([[ 1.08374515e-01,  9.98503796e-02,  1.13323362e-01, ...,
 -7.27833114e-02, -6.58701606e-02, -4.59092965e-02],
 [-4.30198387e-02,  5.57547718e-02,  2.70926177e-02, ...,
 -2.26960075e-02, -8.64611208e-02,  1.89567788e-03],
 [ 2.59377669e-02,  4.83370288e-02, -1.09498919e-02, ...,
 -3.81328738e-02, -1.98113038e-01, -1.12476331e-01],
 ...,
 [ 5.42576376e-02,  5.32189412e-03,  2.76010922e-02, ...,
  9.89545817e-01, -1.40226565e-02, -7.86338250e-04],
 [ 1.60581494e-03,  8.56651825e-02,  1.78415121e-01, ...,
 -1.24233079e-02,  9.52228601e-01, -2.19591161e-02],
 [ 2.27770498e-03,  6.44405862e-03,  1.49430370e-01, ...,
 -6.58105858e-04, -2.32385318e-02,  9.77215825e-01]])
```
