ICP5 Report

1. Diabetes

```
18/18 ──────────────── 0s 2ms/step - acc: 0.7263 - loss: 0.5545
Epoch 98/100
18/18 ──────────────── 0s 2ms/step - acc: 0.7210 - loss: 0.5722
Epoch 99/100
18/18 ──────────────── 0s 2ms/step - acc: 0.6915 - loss: 0.6105
Epoch 100/100
18/18 ──────────────── 0s 2ms/step - acc: 0.7262 - loss: 0.5349
Model: "sequential_26"
```

Layer (type)	Output Shape	Param #
dense_113 (Dense)	(None, 20)	180
dense_114 (Dense)	(None, 1)	21

```
Total params: 605 (2.37 KB)
Trainable params: 201 (804.00 B)
Non-trainable params: 0 (0.00 B)
Optimizer params: 404 (1.58 KB)
None
6/6 ──────────────── 0s 3ms/step - acc: 0.6557 - loss: 0.6935
[0.6563747525215149, 0.671875]
```

With More Dense Layers

```
Epoch 98/100
18/18 ──────────────── 0s 2ms/step - acc: 0.7587 - loss: 0.4827
Epoch 99/100
18/18 ──────────────── 0s 3ms/step - acc: 0.7620 - loss: 0.4609
Epoch 100/100
18/18 ──────────────── 0s 3ms/step - acc: 0.8116 - loss: 0.4471
Model: "sequential_13"
```

Layer (type)	Output Shape	Param #
dense_59 (Dense)	(None, 20)	180
dense_60 (Dense)	(None, 30)	630
dense_61 (Dense)	(None, 40)	1,240
dense_62 (Dense)	(None, 1)	41

```
Total params: 6,275 (24.52 KB)
Trainable params: 2,091 (8.17 KB)
Non-trainable params: 0 (0.00 B)
Optimizer params: 4,184 (16.35 KB)
None
6/6 ──────────────── 0s 2ms/step - acc: 0.7286 - loss: 0.5969
[0.6139330267906189, 0.703125]
```

With Normalization Without More Dense Layers

```
18/18 ──────────────── 0s 2ms/step - acc: 0.8221 - loss: 0.4002
Epoch 96/100
18/18 ──────────────── 0s 2ms/step - acc: 0.8185 - loss: 0.4307
Epoch 97/100
18/18 ──────────────── 0s 2ms/step - acc: 0.8176 - loss: 0.4109
Epoch 98/100
18/18 ──────────────── 0s 2ms/step - acc: 0.8251 - loss: 0.3984
Epoch 99/100
18/18 ──────────────── 0s 2ms/step - acc: 0.8096 - loss: 0.4237
Epoch 100/100
18/18 ──────────────── 0s 2ms/step - acc: 0.8145 - loss: 0.3925
Model: "sequential_27"
```

Layer (type)	Output Shape	Param #
dense_115 (Dense)	(None, 20)	180
dense_116 (Dense)	(None, 1)	21

```
 Total params: 605 (2.37 KB)
 Trainable params: 201 (804.00 B)
 Non-trainable params: 0 (0.00 B)
 Optimizer params: 404 (1.58 KB)
None
6/6 ──────────────── 0s 2ms/step - acc: 0.7670 - loss: 0.4977
[0.4843122065067291, 0.7760416865348816]
```

With Normalization And More Dense Layers

```
Epoch 96/100
14/14 ──────────────── 0s 3ms/step - acc: 1.0000 - loss: 7.6330e-07
Epoch 97/100
14/14 ──────────────── 0s 4ms/step - acc: 1.0000 - loss: 7.2137e-07
Epoch 98/100
14/14 ──────────────── 0s 4ms/step - acc: 1.0000 - loss: 1.5277e-06
Epoch 99/100
14/14 ──────────────── 0s 4ms/step - acc: 1.0000 - loss: 8.4577e-07
Epoch 100/100
14/14 ──────────────── 0s 5ms/step - acc: 1.0000 - loss: 7.1511e-07
Model: "sequential_33"
```

Layer (type)	Output Shape	Param #
dense_134 (Dense)	(None, 20)	620
dense_135 (Dense)	(None, 30)	630
dense_136 (Dense)	(None, 40)	1,240
dense_137 (Dense)	(None, 50)	2,050
dense_138 (Dense)	(None, 1)	51

```
 Total params: 13,775 (53.81 KB)
 Trainable params: 4,591 (17.93 KB)
 Non-trainable params: 0 (0.00 B)
 Optimizer params: 9,184 (35.88 KB)
None
5/5 ──────────────── 0s 4ms/step - acc: 1.0000 - loss: 4.8264e-07
[4.109105873340013e-07, 1.0]
```

2. Breast Cancer

```
14/14 ─────────────── 0s 2ms/step - acc: 1.0000 - loss: 0.5454e-13
Epoch 98/100
14/14 ─────────────── 0s 2ms/step - acc: 1.0000 - loss: 2.5429e-13
Epoch 99/100
14/14 ─────────────── 0s 2ms/step - acc: 1.0000 - loss: 1.0239e-13
Epoch 100/100
14/14 ─────────────── 0s 2ms/step - acc: 1.0000 - loss: 3.3471e-13
Model: "sequential_31"
```

Layer (type)	Output Shape	Param #
dense_129 (Dense)	(None, 20)	620
dense_130 (Dense)	(None, 1)	21

```
Total params: 1,925 (7.52 KB)
Trainable params: 641 (2.50 KB)
Non-trainable params: 0 (0.00 B)
Optimizer params: 1,284 (5.02 KB)
None
5/5 ─────────────── 0s 4ms/step - acc: 1.0000 - loss: 1.9091e-11
[3.6640732115067465e-11, 1.0]
```

With More Dense Layers

```
Epoch 98/100
14/14 ─────────────── 0s 3ms/step - acc: 1.0000 - loss: 1.7124e-12
Epoch 99/100
14/14 ─────────────── 0s 2ms/step - acc: 1.0000 - loss: 7.6315e-13
Epoch 100/100
14/14 ─────────────── 0s 3ms/step - acc: 1.0000 - loss: 3.7908e-13
Model: "sequential_23"
```

Layer (type)	Output Shape	Param #
dense_99 (Dense)	(None, 20)	620
dense_100 (Dense)	(None, 30)	630
dense_101 (Dense)	(None, 40)	1,240
dense_102 (Dense)	(None, 50)	2,050
dense_103 (Dense)	(None, 60)	3,060
dense_104 (Dense)	(None, 1)	61

```
Total params: 22,985 (89.79 KB)
Trainable params: 7,661 (29.93 KB)
Non-trainable params: 0 (0.00 B)
Optimizer params: 15,324 (59.86 KB)
None
5/5 ─────────────── 0s 3ms/step - acc: 1.0000 - loss: 8.0301e-11
[1.550637812597344e-10, 1.0]
```

With Normalization And Without More Dense Layers

```
Epoch 94/100
14/14 ─────────────────── 0s 2ms/step - acc: 1.0000 - loss: 6.6728e-04
Epoch 95/100
14/14 ─────────────────── 0s 2ms/step - acc: 1.0000 - loss: 7.2989e-04
Epoch 96/100
14/14 ─────────────────── 0s 2ms/step - acc: 1.0000 - loss: 7.3481e-04
Epoch 97/100
14/14 ─────────────────── 0s 2ms/step - acc: 1.0000 - loss: 6.7530e-04
Epoch 98/100
14/14 ─────────────────── 0s 2ms/step - acc: 1.0000 - loss: 7.4455e-04
Epoch 99/100
14/14 ─────────────────── 0s 2ms/step - acc: 1.0000 - loss: 6.4365e-04
Epoch 100/100
14/14 ─────────────────── 0s 2ms/step - acc: 1.0000 - loss: 7.4146e-04
Model: "sequential_25"
```

Layer (type)	Output Shape	Param #
dense_111 (Dense)	(None, 20)	620
dense_112 (Dense)	(None, 1)	21

```
 Total params: 1,925 (7.52 KB)
 Trainable params: 641 (2.50 KB)
 Non-trainable params: 0 (0.00 B)
 Optimizer params: 1,284 (5.02 KB)
None
5/5 ─────────────────── 0s 3ms/step - acc: 1.0000 - loss: 0.0014
[0.001164792338386178, 1.0]
```

With Normalization And More Dense Layers

```
14/14 ─────────────────── 0s 3ms/step - acc: 1.0000 - loss: 7.6330e-07
Epoch 97/100
14/14 ─────────────────── 0s 4ms/step - acc: 1.0000 - loss: 7.2137e-07
Epoch 98/100
14/14 ─────────────────── 0s 4ms/step - acc: 1.0000 - loss: 1.5277e-06
Epoch 99/100
14/14 ─────────────────── 0s 4ms/step - acc: 1.0000 - loss: 8.4577e-07
Epoch 100/100
14/14 ─────────────────── 0s 5ms/step - acc: 1.0000 - loss: 7.1511e-07
Model: "sequential_33"
```

Layer (type)	Output Shape	Param #
dense_134 (Dense)	(None, 20)	620
dense_135 (Dense)	(None, 30)	630
dense_136 (Dense)	(None, 40)	1,240
dense_137 (Dense)	(None, 50)	2,050
dense_138 (Dense)	(None, 1)	51

```
 Total params: 13,775 (53.81 KB)
 Trainable params: 4,591 (17.93 KB)
 Non-trainable params: 0 (0.00 B)
 Optimizer params: 9,184 (35.88 KB)
None
5/5 ─────────────────── 0s 4ms/step - acc: 1.0000 - loss: 4.8264e-07
[4.109105873340013e-07, 1.0]
```

3. *Bonus Points* Data Visualization for Breast Cancer csv file

```python
import matplotlib.pyplot as plt
import pandas as pd

datacsv = pd.read_csv(path_to_csv1)

# Grouping data by Diagnosis
diagnosis_counts = datacsv.groupby('diagnosis')['diagnosis'].count()

# Plotting the pie chart
plt.figure(figsize=(4, 4))
plt.pie(diagnosis_counts, labels=diagnosis_counts.index, autopct='%1.1f%%', startangle=90, colors=['#ff9999','#66b3ff'])

# Adding title
plt.title('Distribution of Patients by Diagnosis', fontsize=16)

# Display the plot
plt.axis('equal')  # Equal aspect ratio ensures that pie is drawn as a circle
plt.show()
```
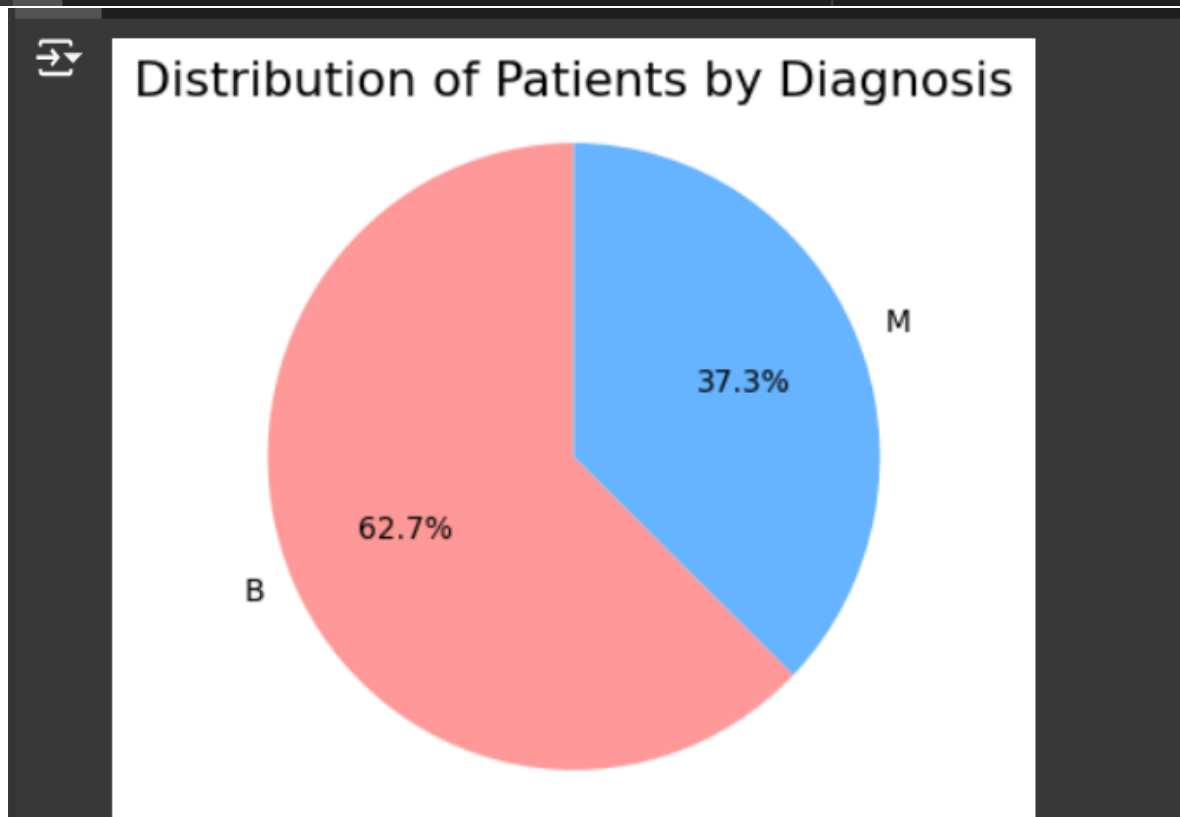

Github link:- https://github.com/Ksahitha/BDA.git