TRIBHUVAN UNIVERSITY

Sagarmatha College of Science & Technology

Lab Report On: Neural Network

Lab Report No.: 04

Date: 2077-08-21

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Question 01:

Write a python program to implement MinMax, Mean, and Standard Scaler.

Height(x₁)	Weight(x₂)
5.8	78
4.9	45
4.6	35
5.7	65
5.4	58
4.7	38

Source Code:

i)   MinMax Scalar

```python
import pandas as pd

data = pd.DataFrame([[5.8, 78], [4.9, 45], [4.6, 35], [5.7, 65], [5.4, 58], [4.7, 38]],

columns = ["Height", "Weight"])

print(f"Original Data:\n{data}")

for col in data.columns:

  min = data[col].min()

  max = data[col].max()

  data[col] = (data[col] - min) / (max - min)

print(f"\nNormalized Data:\n{data}")
```

OUTPUT

Original Data:

   Height Weight

0   5.8   78

1   4.9   45

2	4.6	35
3	5.7	65
4	5.4	58
5	4.7	38

Normalized data:

	Height	Weight
0	1.000000	1.000000
1	0.250000	0.232558
2	0.000000	0.000000
3	0.916667	0.697674
4	0.666667	0.534884
5	0.083333	0.069767

ii)   Mean Scalar

```
import pandas as pd
data = pd.DataFrame([[5.8, 78], [4.9, 45], [4.6, 35], [5.7, 65], [5.4, 58], [4.7, 38]],
columns = ["Height", "Weight"])
print(f"Original Data:\n{data}")
for col in data.columns:
  m = data[col].mean()
  min = data[col].min()
  max = data[col].max()
  data[col] = (data[col] - m) / (max - min)
print(f"\nNormalized Data:\n{data}")
```

OUTPUT

Original Data:

	Height	Weight
0	5.8	78
1	4.9	45
2	4.6	35
3	5.7	65
4	5.4	58
5	4.7	38

Normalized Data:

	Height	Weight
0	0.513889	0.577519
1	-0.236111	-0.189922
2	-0.486111	-0.422481
3	0.430556	0.275194
4	0.180556	0.112403
5	-0.402778	-0.352713

iii) Standard Scalar

```
import pandas as pd
data = pd.DataFrame([[5.8, 78], [4.9, 45], [4.6, 35], [5.7, 65], [5.4, 58], [4.7, 38]],
columns = ["Height", "Weight"])
print(f"Original Data:\n{data}")
for col in data.columns:
  m = data[col].mean()
  sd = data[col].std()
  data[col] = (data[col] - m) / sd
```

```
print(f"\nNormalized Data:\n{data}")
```

OUTPUT

Original Data:

	Height	Weight
0	5.8	78
1	4.9	45
2	4.6	35
3	5.7	65
4	5.4	58
5	4.7	38

Normalized Data:

	Height	Weight
0	1.187509	1.480467
1	-0.545612	-0.486865
2	-1.123319	-1.083026
3	0.994940	0.705457
4	0.417233	0.288145
5	-0.930750	-0.904178

Question 02:

Create a class named MinmaxNorm, define method scale to normalize data using MinMax Scaler. Finally, create a object of the class and normalize the data.

Height(x₁)	Weight(x₂)
5.8	78
4.9	45
4.6	35
5.7	65
5.4	58
4.7	38

Source Code:

```
import pandas as pd
class MinMaxNorm:
  def __init__(self):
    pass

  def scale(self, data):
    for col in data.columns:
      min = data[col].min()
      max = data[col].max()
      data[col] = (data[col] - min) / (max - min)
    return data

data = pd.DataFrame([[5.8, 78], [4.9, 45], [4.6, 35], [5.7, 65], [5.4, 58], [4.7, 38]],
columns = ["Height", "Weight"])
print(f"Original Data:\n{data}")
minmax = MinMaxNorm()
```

```
norm_data = minmax.scale(data)
print(f"\nNormalized data:\n{norm_data}")
```

Output:

Original Data:

	Height	Weight
0	5.8	78
1	4.9	45
2	4.6	35
3	5.7	65
4	5.4	58
5	4.7	38

Normalized data:

	Height	Weight
0	1.000000	1.000000
1	0.250000	0.232558
2	0.000000	0.000000
3	0.916667	0.697674
4	0.666667	0.534884
5	0.083333	0.069767