# Team Members

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# Overview

This project focuses on recognizing ASL hand signs using deep learning.
The dataset is Sign Language MNIST (A—Z except J & Z, grayscale images).
We built and trained a CNN model through preprocessing, transformations, and image data generation.
Implementation used Python, TensorFlow/Keras, Scikit-learn, Matplotlib, Seaborn, Pandas, NumPy, and PIL.
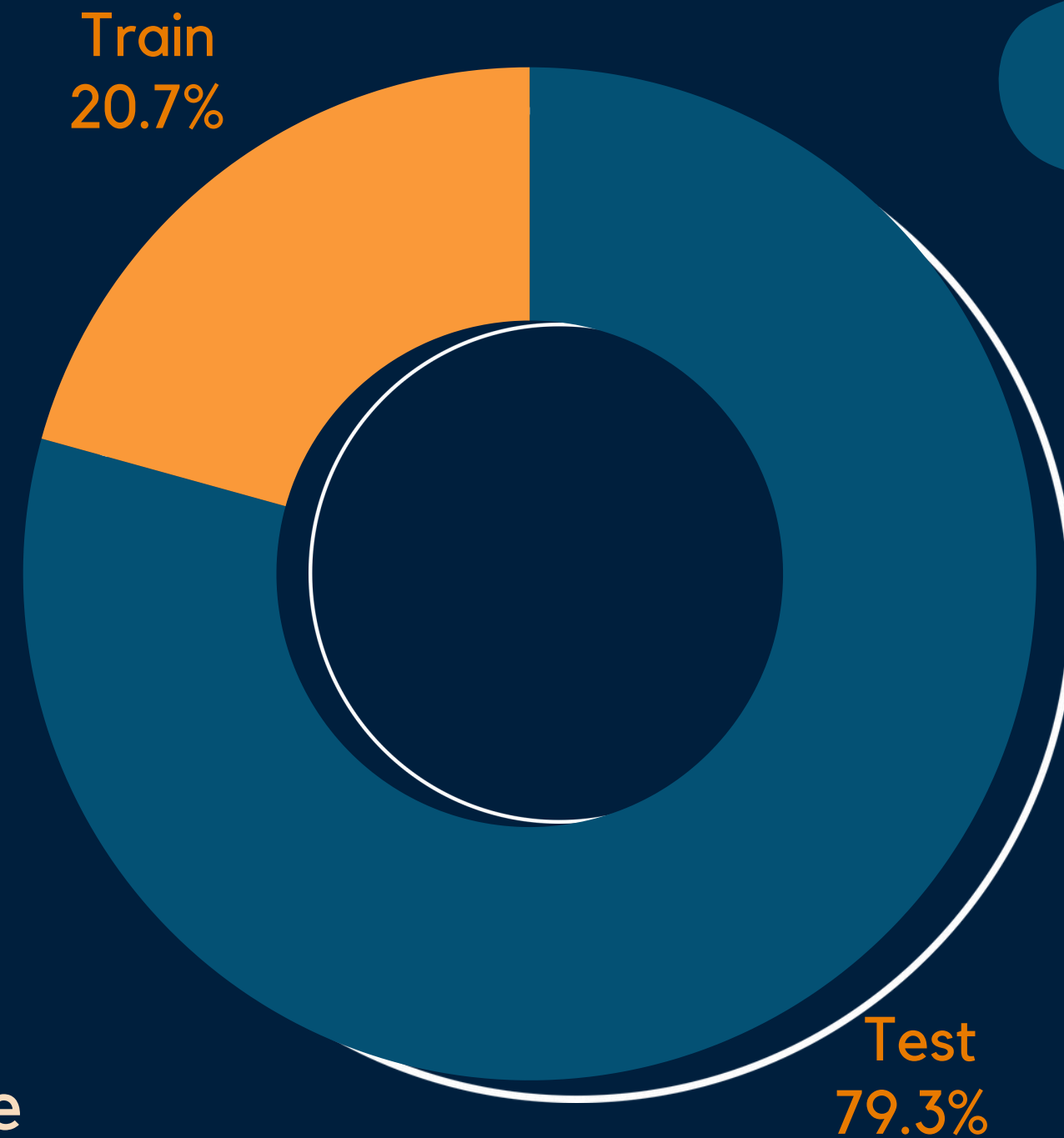
# Dataset

**27,455**
- **Train** Images

**7,172**
- **Test** Images

- **Images**
28×28 pixels, grayscale

- **Classes**
24 letters (A–Y, without J & Z)
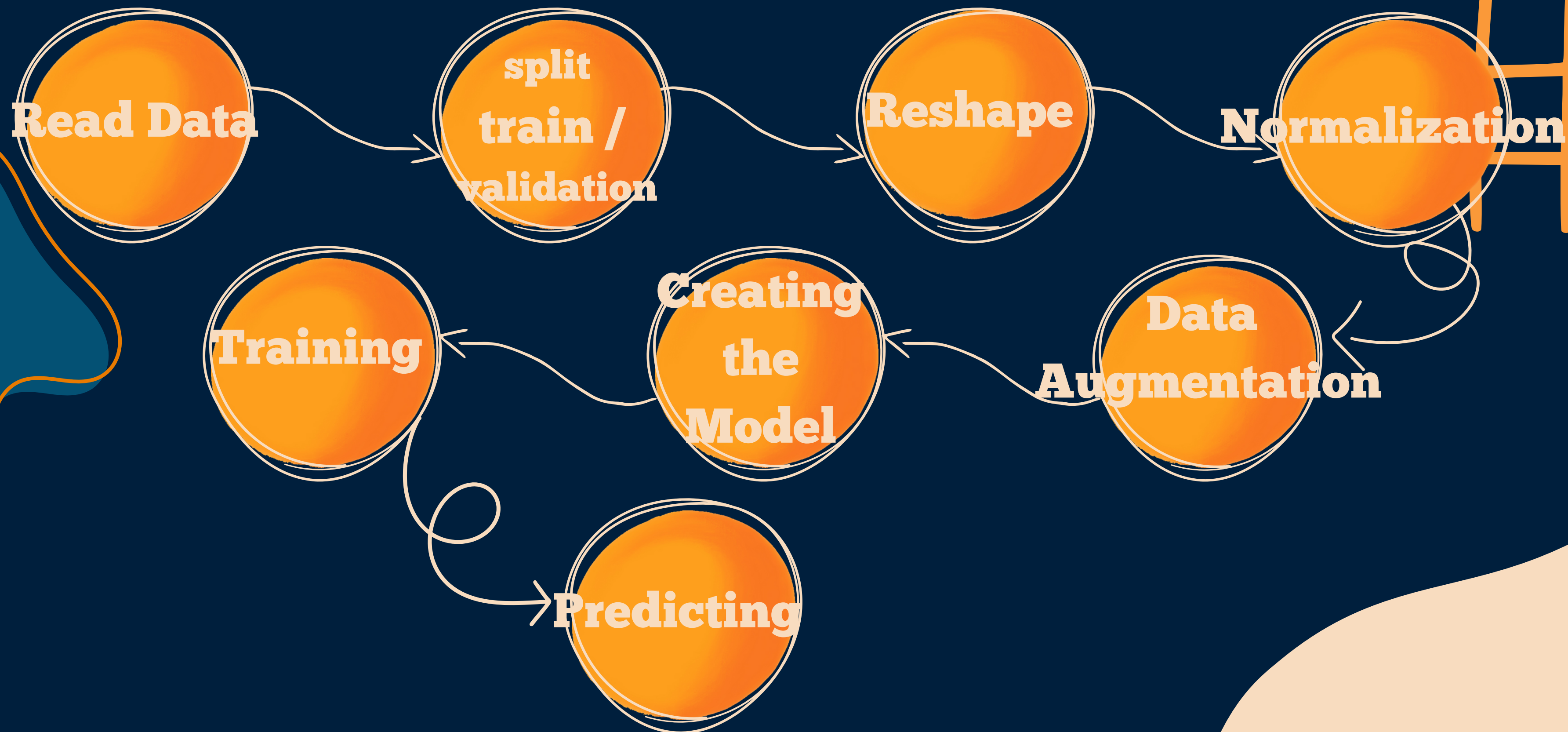
Train
20.7%

Test
79.3%

# Samples & Transformations
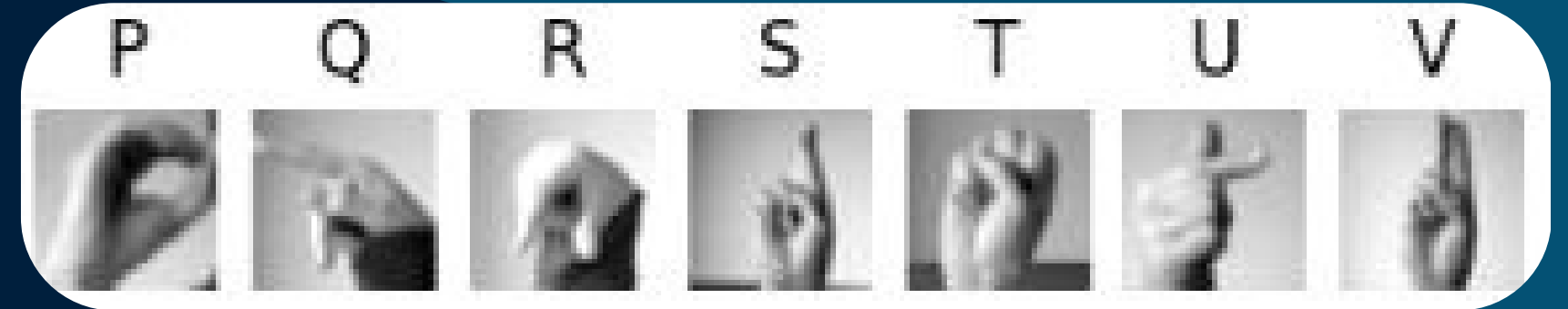


- **Reshaping to 28×28**

- **Normalization (0–1)**

- **Data augmentation (rotation, shift, zoom if applied)**

# Pipeline

# classification report

```
classification report:
              precision    recall  f1-score   support

           0       1.00      1.00      1.00       331
           1       1.00      1.00      1.00       432
           2       1.00      1.00      1.00       310
           3       1.00      1.00      1.00       245
           4       1.00      1.00      1.00       498
           5       1.00      1.00      1.00       247
           6       1.00      0.97      0.99       348
           7       0.98      1.00      0.99       436
           8       1.00      1.00      1.00       288
          10       1.00      1.00      1.00       331
          11       1.00      1.00      1.00       209
          12       1.00      1.00      1.00       394
          13       1.00      1.00      1.00       291
          14       1.00      1.00      1.00       246
          15       1.00      1.00      1.00       347
          16       1.00      1.00      1.00       164
          17       1.00      1.00      1.00       144
          18       1.00      1.00      1.00       246
          19       1.00      0.96      0.98       248
          20       1.00      1.00      1.00       266
          21       1.00      1.00      1.00       346
...
    accuracy                           1.00      7172
   macro avg       1.00      1.00      1.00      7172
weighted avg       1.00      1.00      1.00      7172
```