



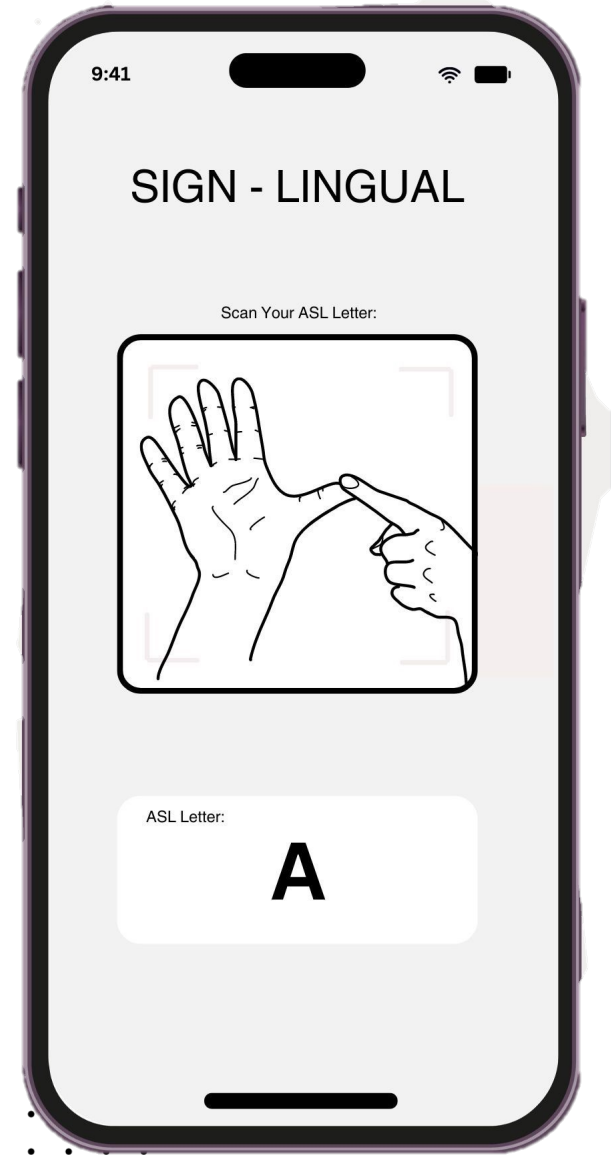
# CAPSTONE PROJECT

**SIGN-LINGUAL**

BY SIMREN BASRA

# THE PROBLEM

- **Scenario:** A deaf commuter uses public transport where there is a route diversion.
- **Challenge:** The commuter encounters difficulties in finding signers to translate announcements.



# METHOD

## STREAMLIT

Scan ASL Letter



ASL Letter:

**A**

**IN:** Image

Machine Learning  
Model



**OUT:** Predicted Letter

# DATA PREPARATION

- Reshape input images to different sizes



- Data augmentation

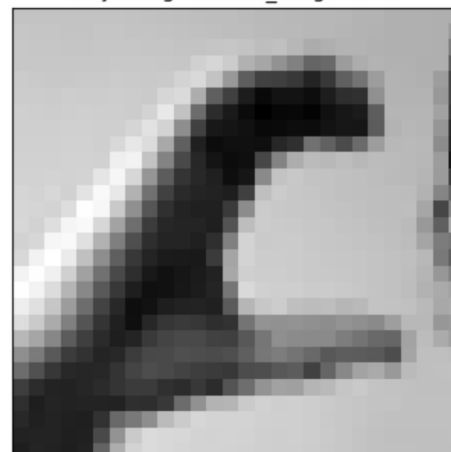
Original Input Image C



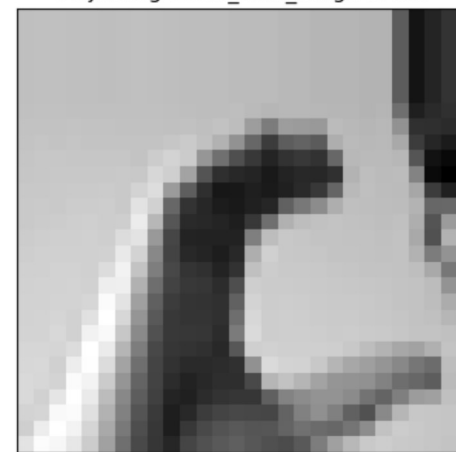
Adjusting horizontal\_flip to True



Adjusting rotation\_range to 20



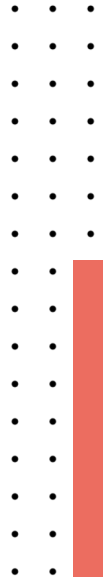
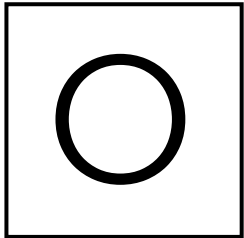
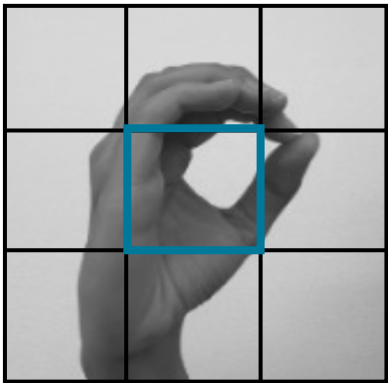
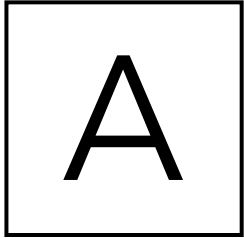
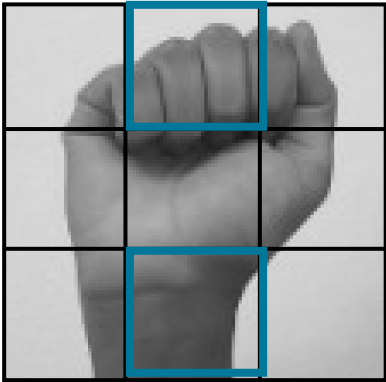
Adjusting width\_shift\_range to 0.2



# MODEL 1

SCORE

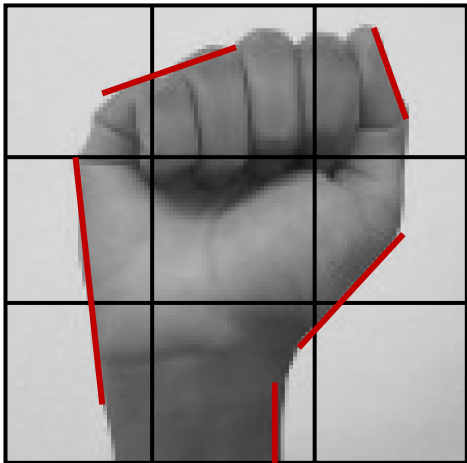
Train: 99.99  
Validation: 99.98



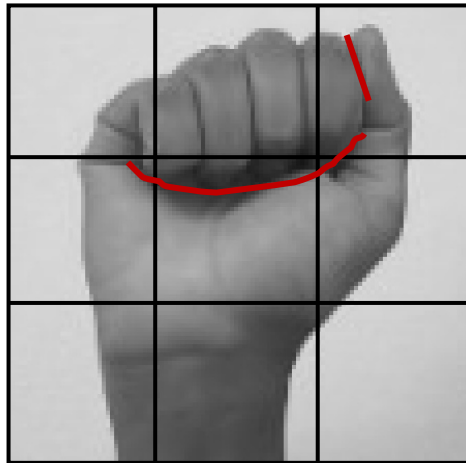
# MODEL 2

SCORE

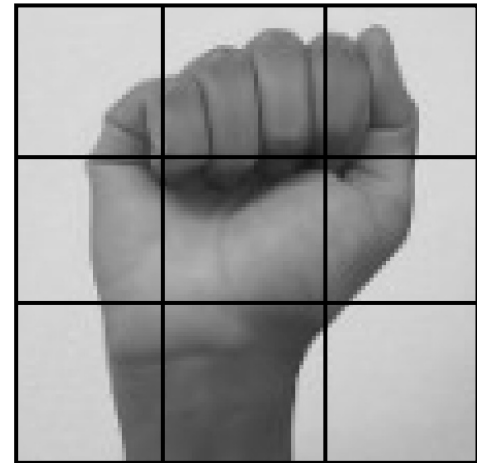
Train: 99.03  
Validation: 98.86



Edges



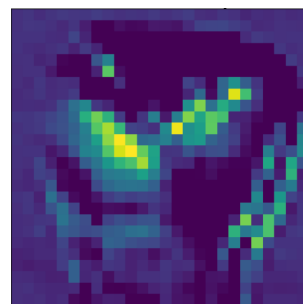
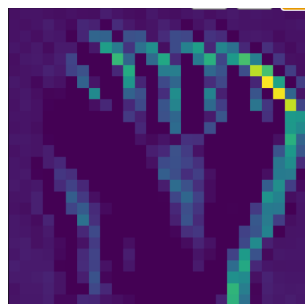
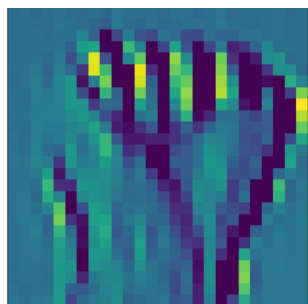
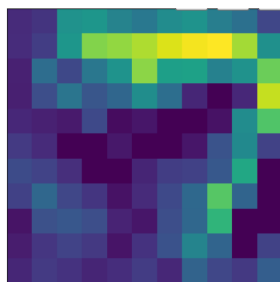
Patterns



Colour Variations

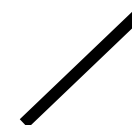
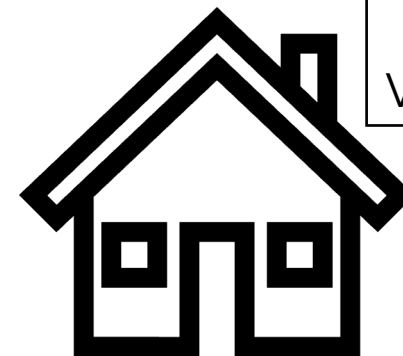


# MODEL 3



SCORE

Train: 99.95  
Validation: 99.93





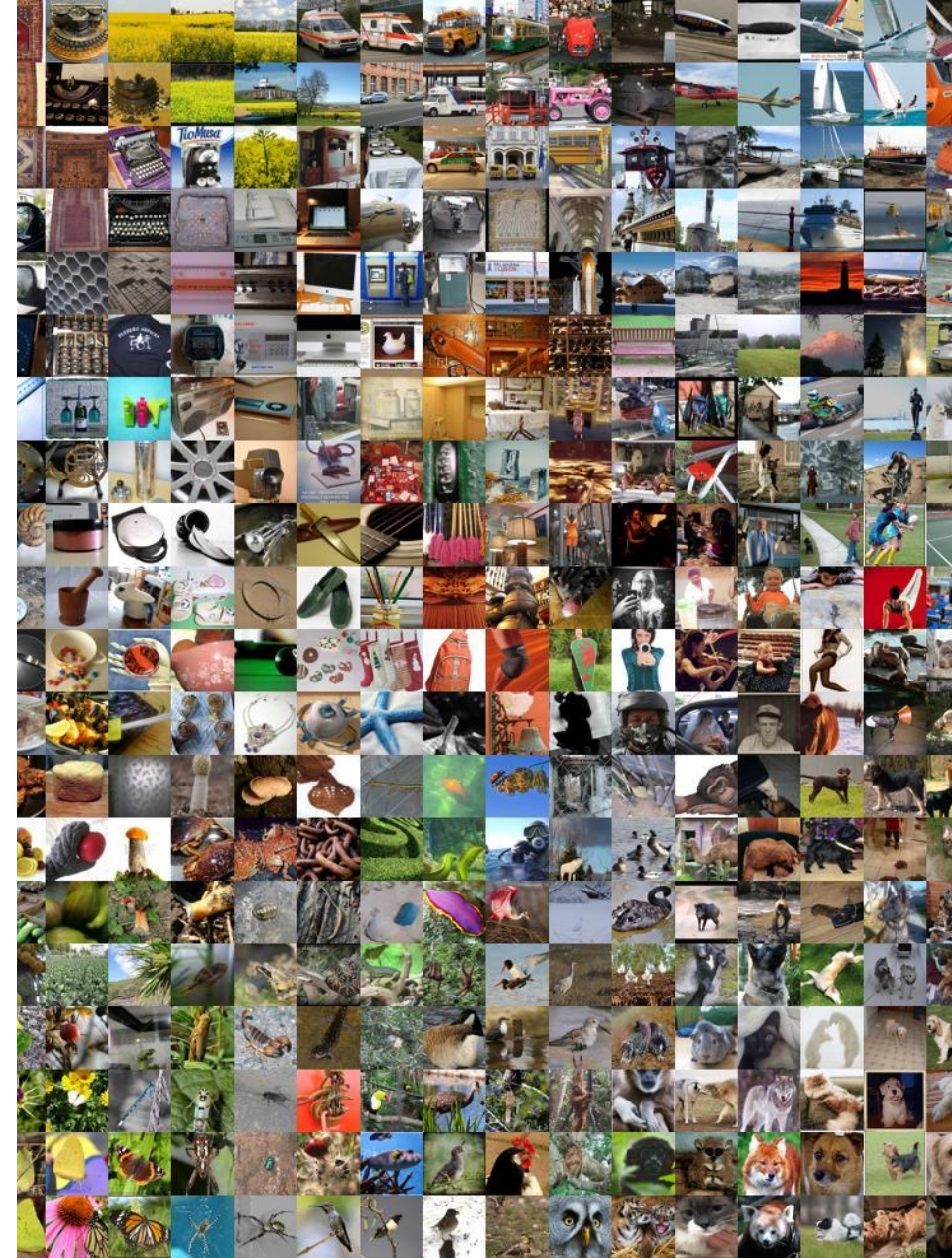
# MODEL 4

## Transfer Learning

- Pre-defined model
- Trained on data outside of our dataset
- Detects even more patterns
- Fine-tuned to our dataset for optimal performance

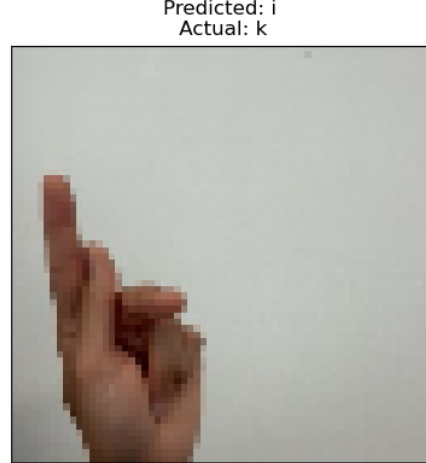
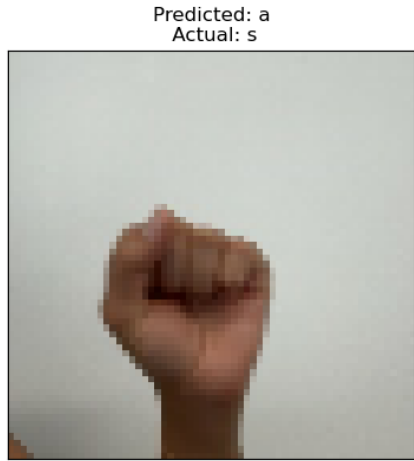
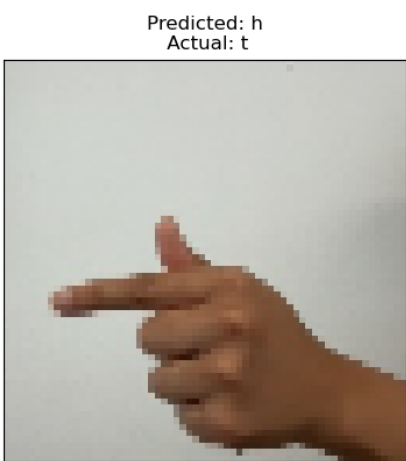
### SCORE

Train: 99.99  
Validation: 99.99

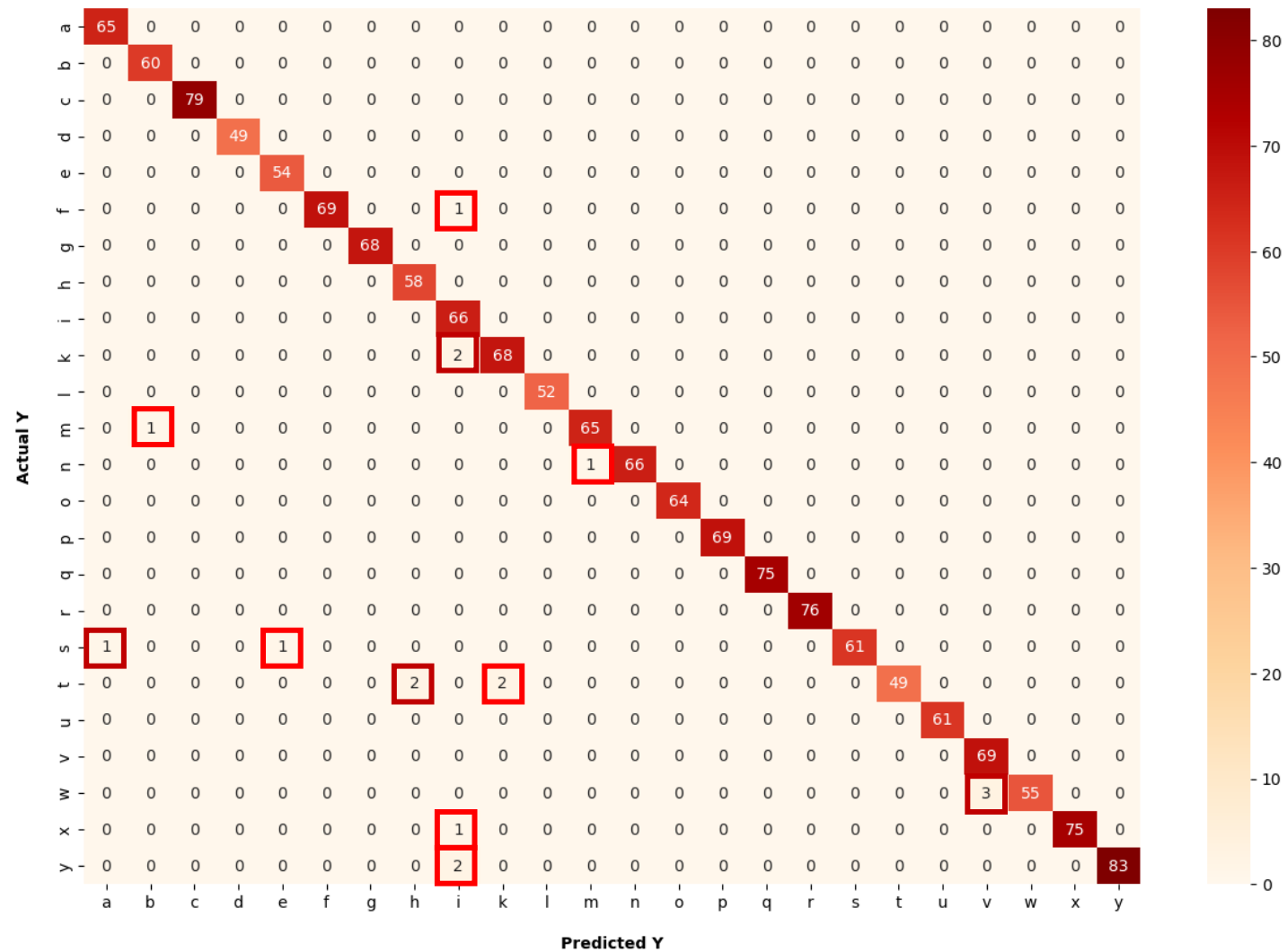




# EVALUATION



### Confusion Matrix for Test Data





## LESSONS LEARNT

- Timings
- Importance of Image Dimensionality
- Google and Documentation
- Computer Vision

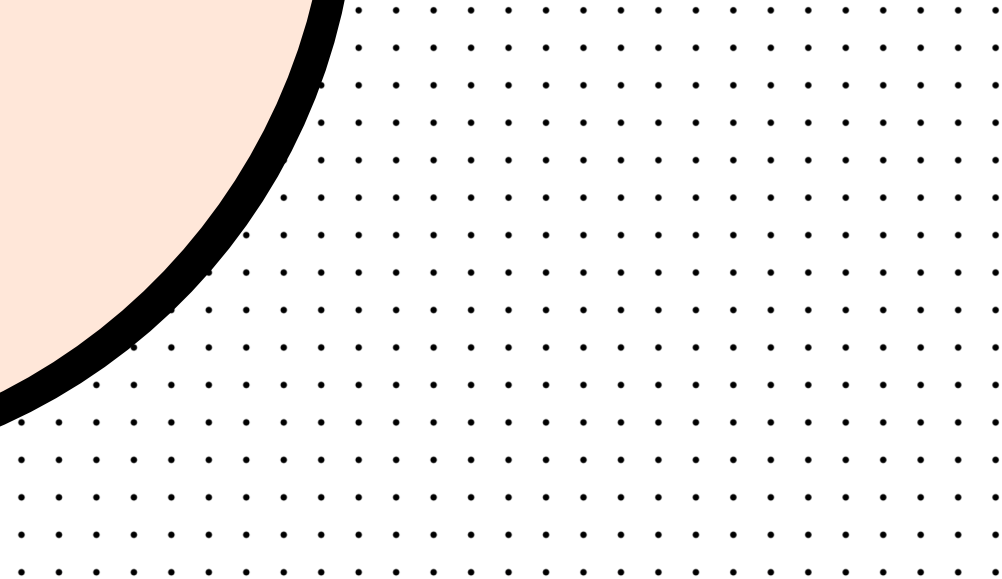


## NEXT STEPS

- Data Collection
- Testing
- Letter to Word



D E M O



ANY  
QUESTIONS?

