

## Determine The Requirements (Data Flow Diagram)

Process Number	Process Name	Input	Output
1	Load Video Data	Video file path	Preprocessed video frames
2	Load Alignments	Alignment file path	Aligned text representations
3	Extract Frames	Video frames	Individual frames from the video
4	Preprocess Frames	Individual frames	Grayscale, cropped frames ready for lip reading
5	Load Video Sequences	Preprocessed frames	Video sequences for model input
6	Load Aligned Text	Aligned text file	Text corresponding to each frame in the video
7	Tokenize Text	Aligned text	Tokenized representation of the aligned text
8	Create Data Batches	Video sequences, Tokenized text	Batched and padded data for training the model
9	Train Lip Reading Model	Batched and padded data	Trained lip reading model
10	Make Prediction	Preprocessed video frames	Lip reading model predictions

11	Convert Predictions to Text	Model predictions	Decoded text from lip reading model predictions
12	Store Trained Model	Trained lip reading model	Stored model for future use

## Data Stores:

Data Store Number	Data Store Name	Description
1	Video Data Store	Repository for video files.
2	Alignment Data Store	Repository for alignment files.
3	Trained Model Store	Repository for storing trained lip reading models.

## Data Flows:

Flow Number	Flow Name	From Process	To Process
1	Video Data Flow	Users	Load Video Data (Process 1)
2	Alignment Data Flow	Users	Load Alignments (Process 2)
3	Extracted Frames Flow	Load Video Data (Process 1)	Extract Frames (Process 3)
4	Preprocessed Frames Flow	Extract Frames (Process 3)	Preprocess Frames (Process 4)
5	Video Sequences Flow	Preprocess Frames (Process 4)	Load Video Sequences (Process 5)

6	Aligned Text Flow	Load Alignments (Process 2)	Tokenize Text (Process 7)
7	Tokenized Text Flow	Tokenize Text (Process 7)	Create Data Batches (Process 8)
8	Training Data Flow	Create Data Batches (Process 8)	Train Lip Reading Model (Process 9)
9	Prediction Data Flow	Users	Make Prediction (Process 10)
10	Decoded Text Flow	Make Prediction (Process 10)	Convert Predictions to Text (Process 11)
11	Model Storage Flow	Train Lip Reading Model (Process 9)	Store Trained Model (Process 12)

- Data stores represent repositories for specific data types.
- Data flows highlight the movement of data between processes, providing a more granular view.

