

API DRIVEN CLOUD NATIVE SOLUTIONS

ASSIGNMENT 2



GROUP DETAILS

Group No: 12

Group Member Names with Contribution:

Sl. No	BITS ID	Name	Contribution of team member (Qualitative)	Percentage Contribution (Out of 100) Quantitative
1	2023MT03552	Amuthavarsni R	Fluency Feedback, Question Generation and Fine tuning and Integration	25%
2	2023MT03517	Shah Pratik Kiran	Voice to Text and Text to Voice Integration	25%
3	2023MT03577	Pradhan Vaishnavi Mangesh	Application UI, DB Connection and Integration	25%
4	2023MT03586	P Rahul Kumar	Model Fine Tuning Base Design and Report	25%

OVERVIEW

DOMAIN - EDUCATION – AI-BASED INTERVIEW PRACTICE TOOL

This project is focused on the Education domain, with a specific objective of enhancing interview preparation for students and job seekers. The system acts as an intelligent mock interview assistant, offering an automated and interactive environment that mimics real-life interview scenarios. It allows candidates to respond using voice or text, receive dynamic questions, and get instant evaluation and feedback powered by AI.

The solution aims to:

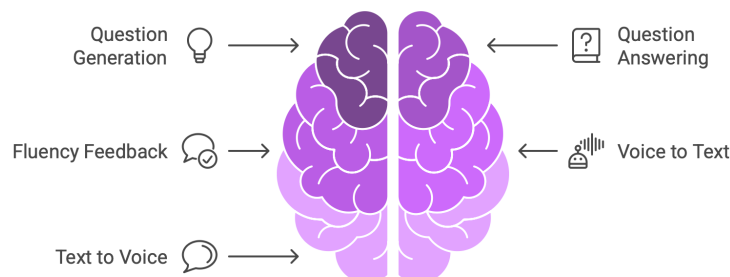
- Improve candidate readiness through repeated practice.
- Provide personalized and constructive feedback.
- Make interview preparation accessible, scalable, and engaging.

To implement this solution, the project combines two AI categories:

- Natural Language Processing (NLP):
 - For tasks like generating questions, evaluating answers, and providing fluency feedback.
- Speech Recognition:
 - For enabling voice-based interaction, converting speech to text and vice versa.

These AI capabilities work together to form a cohesive system that supports the candidate throughout their interview journey—from question delivery to performance evaluation.

AI Functionalities Overview



SELECTED SUB-TASKS

Categories	Sub-Task	Description
NLP	Question Generation	Generate interview questions using OpenAI GPT
NLP	Question Answering	Use fine-tuned DistilBERT to understand and score candidate answers
NLP	Fluency Feedback	GPT model gives natural language feedback on grammar, tone, and completeness
Speech Recognition	Voice to Text	OpenAI Whisper converts candidate's spoken answers to text
Speech Recognition	Text to Voice	gTTS converts generated questions into spoken form for the user

MODELS USED

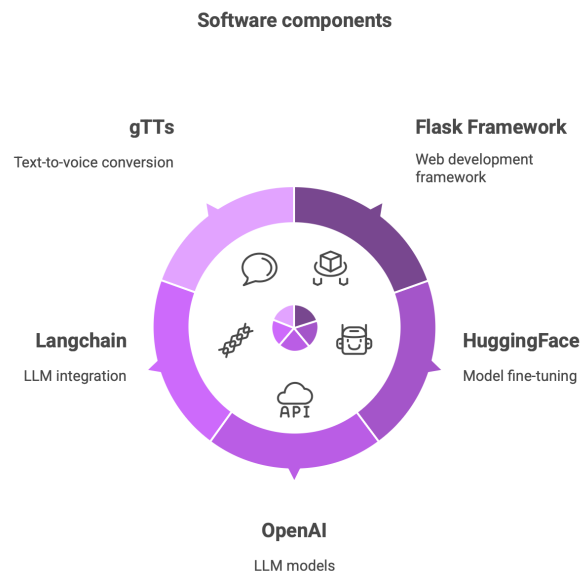
Sub-Task	Model	Provider
Question Generation	GPT-3.5 (LLM)	OpenAI
Question Answering	DistilBERT (fine-tuned on QA)	Hugging Face

Fluency Feedback	GPT-3.5	OpenAI
Voice to Text	Whisper	OpenAI
Text to Voice	gTTS (Google Text-to-Speech)	Google

API INTEGRATION AND APPLICATION DESIGN

TECHNOLOGIES USED

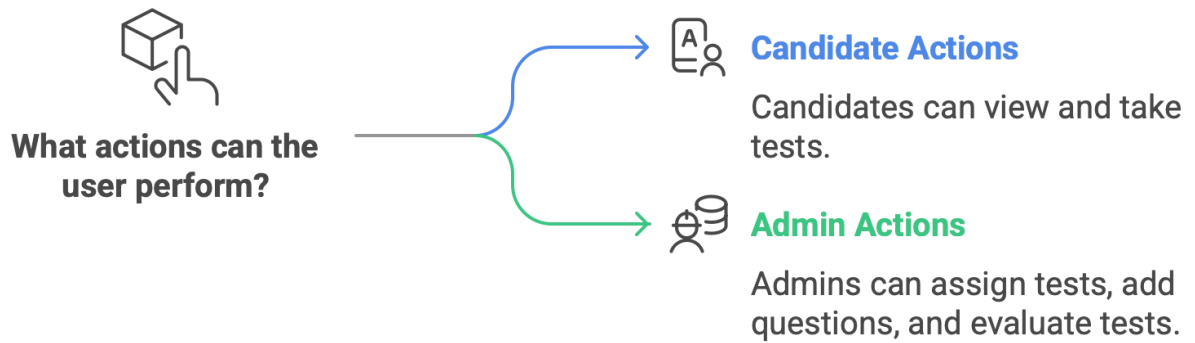
- The Following are the technologies used in the application implementation:
 - Flask – Web Application Framework
 - HuggingFace - Model hosting and fine-tuning platform
 - OpenAI API - LLM integration (GPT, Whisper)
 - Langchain – Model Orchestration and Integration
 - gTTS – Text to Speech conversion



MODEL FINE-TUNING

- Dataset Used:
 - SQuAD (Stanford Question Answering Dataset) – a widely used benchmark dataset for reading comprehension and QA tasks.
- Model Fine-Tuned:
 - **distilbert-base-uncased**
 - Task: Question Answering
 - Platform: HuggingFace, Collab
 - Training Details: Fine-tuned on SQuAD v1.1 format where the model learns to predict answer spans from a given context paragraph in response to a question.
- Purpose:
 - To accurately assess candidate responses by extracting and comparing expected answers from context, improving the feedback and scoring quality during interviews.

SCREENSHOTS AND OUTPUTS



CANDIDATE DASHBOARD

CANDIDATE HOME

Welcome, ammu!

Logout

Your Tests

Sample Interview Test
This is a sample test to get you started.

Completed

Created: 2025-04-28

Completed

LLM Generated Test - 1
LLM Generated questions with answers in their context. This can be passed to the fine tuned QA model during evaluation.

In Progress

Created: 2025-04-28

Continue Test

CANDIDATE TEST

LLM Generated Test - 1

Question 1 of 3

[Back to Test](#)[Logout](#)

Current Question

What programming languages are you most proficient in and how have you used them in a practical setting?

▶ 0:02 / 0:07 🔊 ⋮

Record Answer

[Previous Question](#)[Next Question](#)

Answer Transcript

I am proficient with Python and I am also proficient with other languages like JavaScript. And I have also used shell scripts to write a bunch of scripts. I have used Python and JavaScript to write lambdas in AWS. And I have also been using them in other back-end and front-end applications.

Feedback Summary

Score: 8/10

Grammar: The grammar is mostly correct, with a few minor errors.

Fluency: The fluency is good, with some pauses and hesitations.

Suggestions for improvement:

1. Use "I have been proficient" instead of "I am proficient" to indicate ongoing proficiency.

ADMIN DASHBOARD

ADMIN HOME

Admin Dashboard

[View Tests](#)[Create Test](#)

Welcome, admin

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Candidates

Name	Position	Score	Feedback Status	Actions
candidate	Software Engineer	0.0	Pending	View Details
ammu	Software Engineer	0.0	Pending	View Details

ADMIN TESTS

Test Management

[Back to Dashboard](#)

[Create New Test](#)

[Logout](#)

All Tests					
Title	Description	Candidate	Status	Created	Actions
Sample Interview Test	This is a sample test to get you started.	ammu	Completed	2025-04-28	View Details Evaluate
LLM Generated Test - 1	LLM Generated questions with answers in their context. This can be passed to the fine tuned QA model during evaluation.	ammu	In Progress	2025-04-28	View Details

ADMIN EVALUATE

Interview System

[Dashboard](#) [Tests](#) [Logout](#)

Evaluate Test: Sample Interview Test

Test Description

This is a sample test to get you started.

Question 1

Tell me about a challenge you overcame?

Context:

I overcome my challenges by planning and precision

Candidate's Answer:

Hello, I'm trying to see if this microphone is working.

Model's Answer:

Click "Evaluate with AI" to get the model's answer

Evaluation:

Score (0-10):

Feedback:

[Submit Evaluation](#)

Question 2