

# AI for Bharat Hackathon

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**Team Name :** Viper\_Coders

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**Problem Statement :** AI for Learning & Developer Productivity.

## CodeBuddy:

**The AI Logic Tutor & Lab Assistant** CodeBuddy is an AI-powered educational tool designed to help Computer Science students move beyond "copy-pasting" fixes. Unlike standard coding assistants that just correct syntax, CodeBuddy uses **Amazon Bedrock** to explain the *logic* behind an error and prepares students for their lab exams by generating instant "Viva Voce" questions based on their specific code.

- **How is it different?**

Standard tools (like ChatGPT) give the *answer*. CodeBuddy gives the *explanation* and forces the student to learn the concept (e.g., "You forgot to dereference the pointer").

- **How it solves the problem:**

It bridges the gap between writing code and understanding logic, reducing the anxiety students feel during lab exams.

## **USP ( Unique Selling Point) :**

**Viva Prep Mode:** The only tool that turns a bug fix into an interview preparation session .

**Amazon Bedrock Integration:** Uses the Claude 3 Sonnet model for high-precision logic analysis.

## 1. Smart Logic Debugger:

- Identifies logical errors (not just syntax) and explains them in simple, non-technical English.

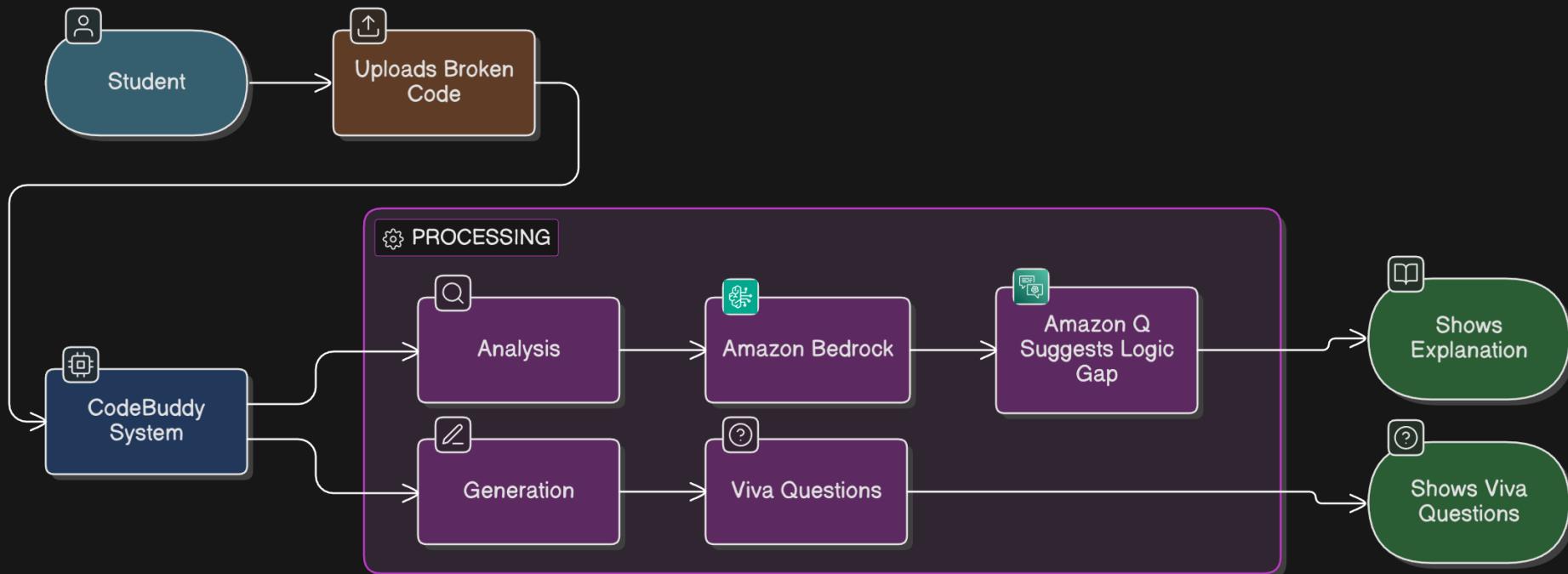
## 2. Viva Voce Generator:

- Automatically creates 3 potential "Viva" questions related to the code the student just wrote (e.g., "Why did you use a while loop here instead of for?").

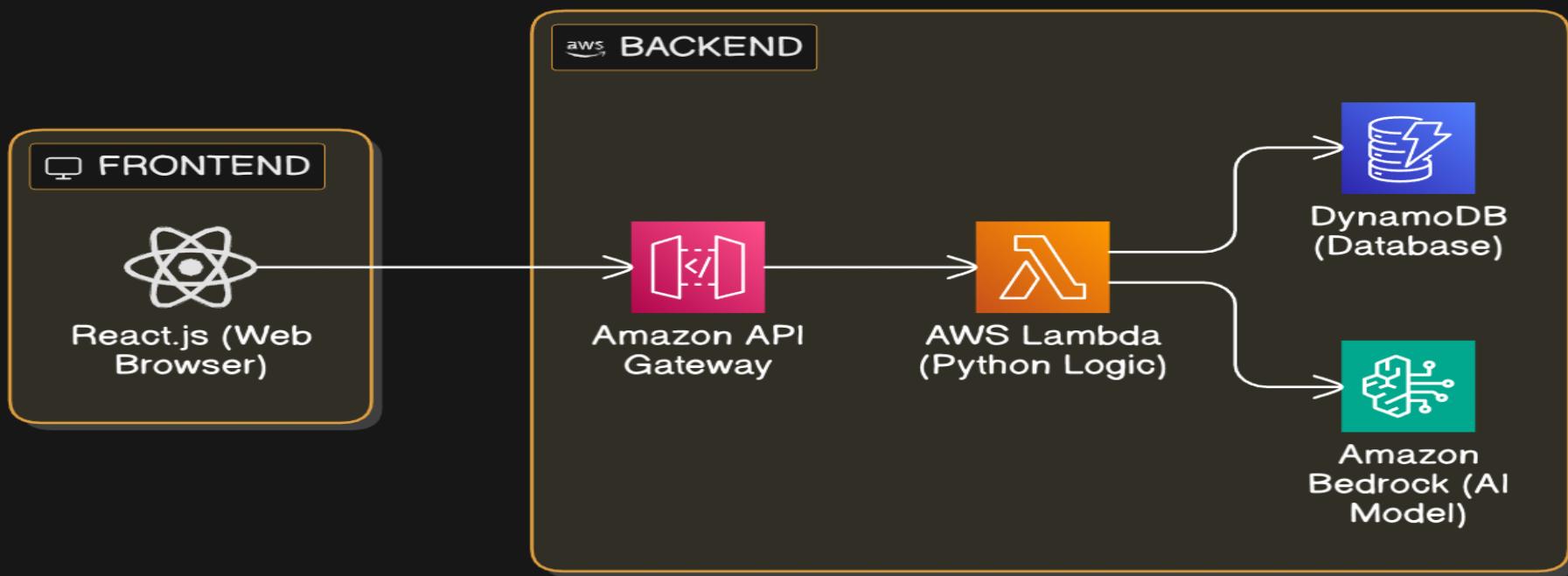
## 3. Resource Mapper:

- Recommends specific documentation or video timestamps for the concepts the student is struggling with.

# How CodeBuddy Works (User Flow)



# AWS Serverless Architecture



- **GenAI Service:** Amazon Bedrock (Claude 3 Sonnet)
- **Coding Assistant:** Amazon Q
- **Compute:** AWS Lambda & API Gateway
- **Database:** Amazon DynamoDB
- **Language:** Python (Backend), React.js (Frontend)

## Estimated implementation cost (optional):

Service	Usage Type	Estimated Monthly Cost
Amazon Bedrock	AI Model Inference (Claude 3 Sonnet)	₹0 (Free Tier) / ₹800 (at scale)
AWS Lambda	Serverless Compute (Backend logic)	₹0 (First 400k GB-seconds free)
Amazon DynamoDB	Database (Student History)	₹0 (25 GB Storage free)
Amazon Q	Coding Assistance	Free Preview (for developers)
Frontend Hosting	AWS Amplify / S3 Static Hosting	₹0 (First 12 months free)
<b>TOTAL</b>	<b>MVP / Prototype Phase</b>	<b>₹0 / Month</b>

*"The solution is designed to be **Serverless**, meaning we only pay when a student actually uses the tool. This keeps the maintenance cost near zero during the initial launch."*

# Future Roadmap & Impact

## Future Scalability:

- Expand support from C/Python to **Java & JavaScript**.
- Integrate with college LMS (Learning Management Systems) for teachers to track class performance.

- Add a "**Voice Viva**" feature where the AI speaks the questions and listens to the student's answers.

## Potential Impact:

- **Reduce Failure Rates:** Helps students clear lab exams by understanding logic.
- **Teacher Productivity:** Reduces the burden on professors to explain basic syntax errors to 60+ students individually.

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