IBM AI Internship Project

IBM SkillsBuild

CSRBOX® Doing Good in a Better Way

Title : Development of a Web-Based Learning Application with Subject-Wise Quizzes and Performance Tracking

Subtitle : Featuring Quiz Modules, Backend Integration, and Real-Time Feedback with Relay

Presented by : The Matrix

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INTRODUCTION

- **Learning Platform Overview**
  - A web-based platform designed to help students learn core subjects like English, Math, Science, and Computers.
  - Combines videos, resources, and interactive quizzes to personalize the learning experience.
- **Current Challenges**
  - Students often rely on scattered resources, leading to inefficient learning.
  - Most platforms offer little real-time feedback or personalized support based on performance.
- **Potential Solution**
  - Integrating **Agentic AI** to automate quiz result collection, backend processing, and feedback delivery.
  - Machine-driven insights can identify weak topics and generate focused study material, improving efficiency and learning outcomes.

PROBLEM STATEMENT

Objective

- To develop an AI-powered educational agent capable of analyzing learner performance data and generating personalized learning paths.**Specific Goals**

Specific Goals:

- Data Collection and Preprocessing
- Workflow Automation with Relay
- PDF & Feedback Generation
- Integration with Frontend
- Testing and Validation
- Ethical and Practical Considerations

SUSTAINABLE DEVELOPMENT GOAL

Goal Chosen: Quality Education (SDG 4) & Industry, Innovation, and Infrastructure (SDG 9)

Problem Statement:
Traditional education systems often lack personalization, real-time feedback, and scalable infrastructure. Students face fragmented learning experiences, and educators are limited by manual data handling and outdated feedback methods. These challenges make it harder to deliver inclusive, engaging, and effective learning at scale.

Rationale:
We chose **SDG 4** because our platform focuses on improving learning outcomes through real-time feedback, adaptive content, and accessible educational tools. We selected **SDG 9** as well because our use of **an AI Agent** builds efficient digital infrastructure and brings innovation to the education space by automating backend processes and data handling.

TOOLS AND RESOURCES

- **Frontend:**
  - **HTML, CSS, JavaScript**
    Used to build a responsive and interactive user interface for selecting subjects, taking quizzes, and viewing feedback.
- **Data Handling:**
  - **JSON Files (Per Subject & Level)**
    Quiz questions are organized in structured JSON files for Basic, Intermediate, and Advanced levels across subjects like English, Math, and Science.
- **Backend Automation:**
  - **Relay.app (No-Code Automation Tool)**
    Handles quiz submission, weak topic detection, feedback generation, and email delivery — all through visual workflows.
- **Design:**
  - **Responsive UI**
    Works smoothly across desktops, tablets, and mobile devices. Designed with simplicity to reduce distractions and support student focus.

RELAY WORKFLOW DEVELOPMENT

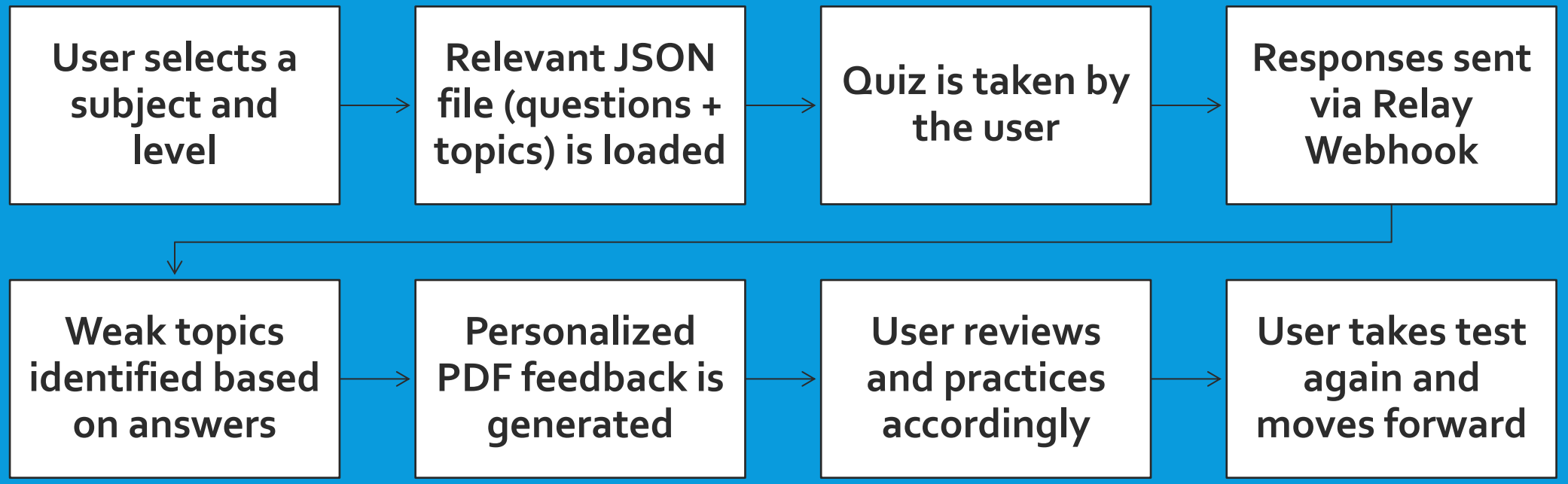
Core Functions of the Relay Workflow:

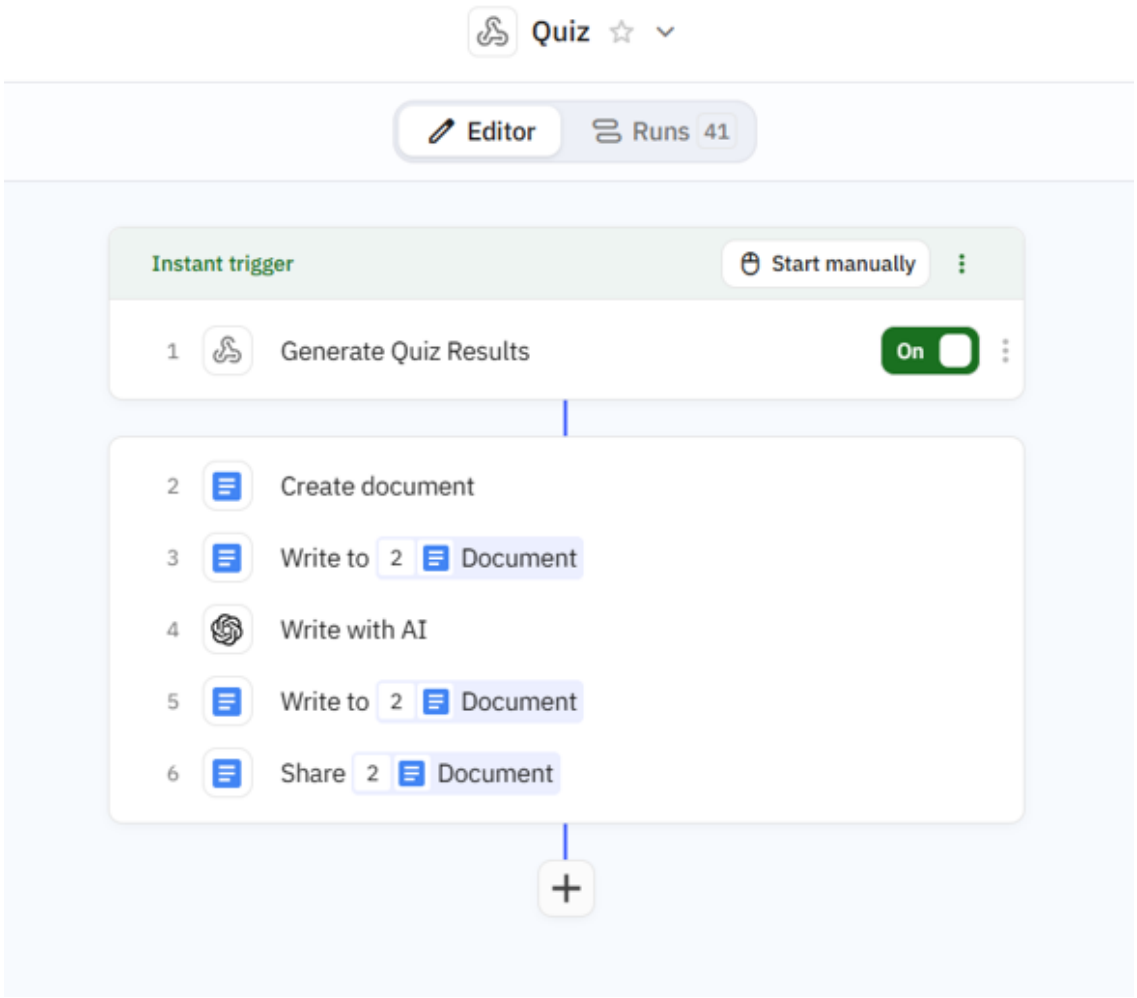
- **Quiz Data Collection**
  Relay webhooks receive student answers, level, and topic info immediately after quiz submission.
- **Weak Topic Detection**
  Logic conditions identify which topics the student struggled with based on score thresholds.
- **PDF Feedback Generation**
  Personalized feedback is auto-generated and converted into a downloadable PDF report.
- **AI-Powered Question Generation**
  New questions are generated based on the student's weak topics to support targeted practice.
- **Email Delivery**
  Generated reports are automatically emailed to students (and optionally teachers) in real-time.

Future Expansion:

- **Multi-Language Support**
  Auto-translate feedback into regional languages to make learning more inclusive and accessible.

ARCHITECTURE DIAGRAM / SYSTEM FLOW





RELAY WORKFLOW

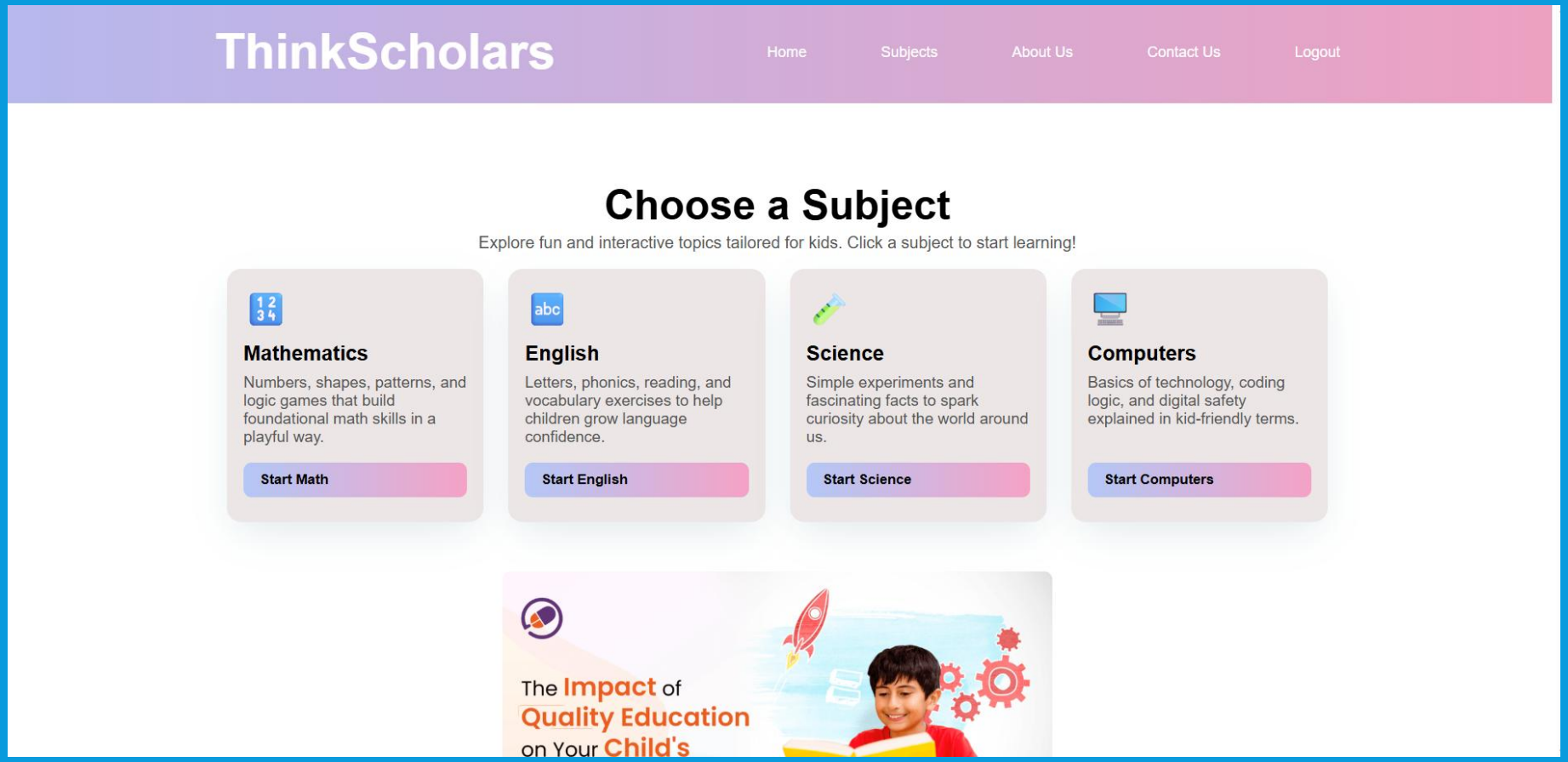
WHY IT WILL WORK AND EXPECTED OUTCOMES

- Reduces Teacher Workload’
- Modular and Easy to Update
- Designed for Speed & Simplicity
- Future-Ready Architecture
- Builds self drive learners
- Personalized Learning
- Bridges the Gap Between Learning and Feedback

DEMO

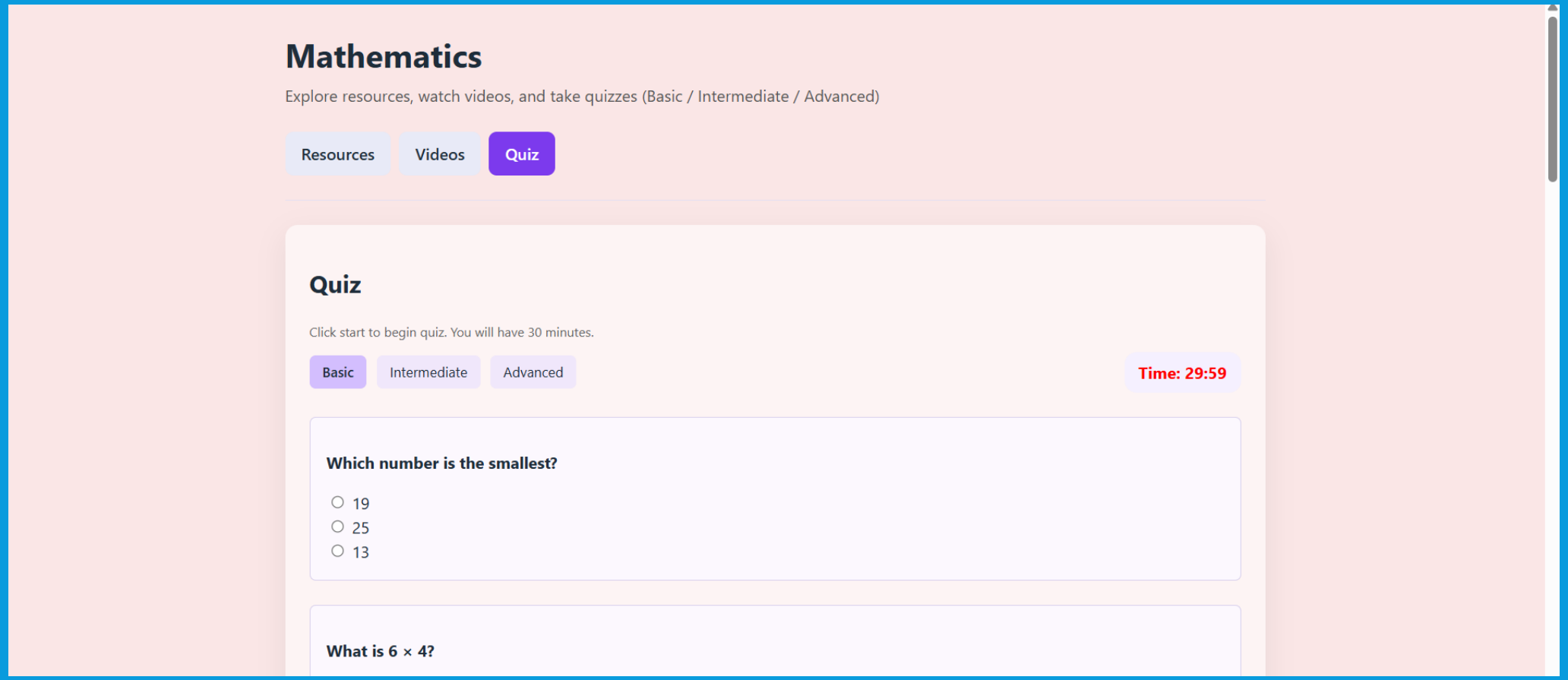
HOME PAGE(SUBJECT SELECTION)

PART 1



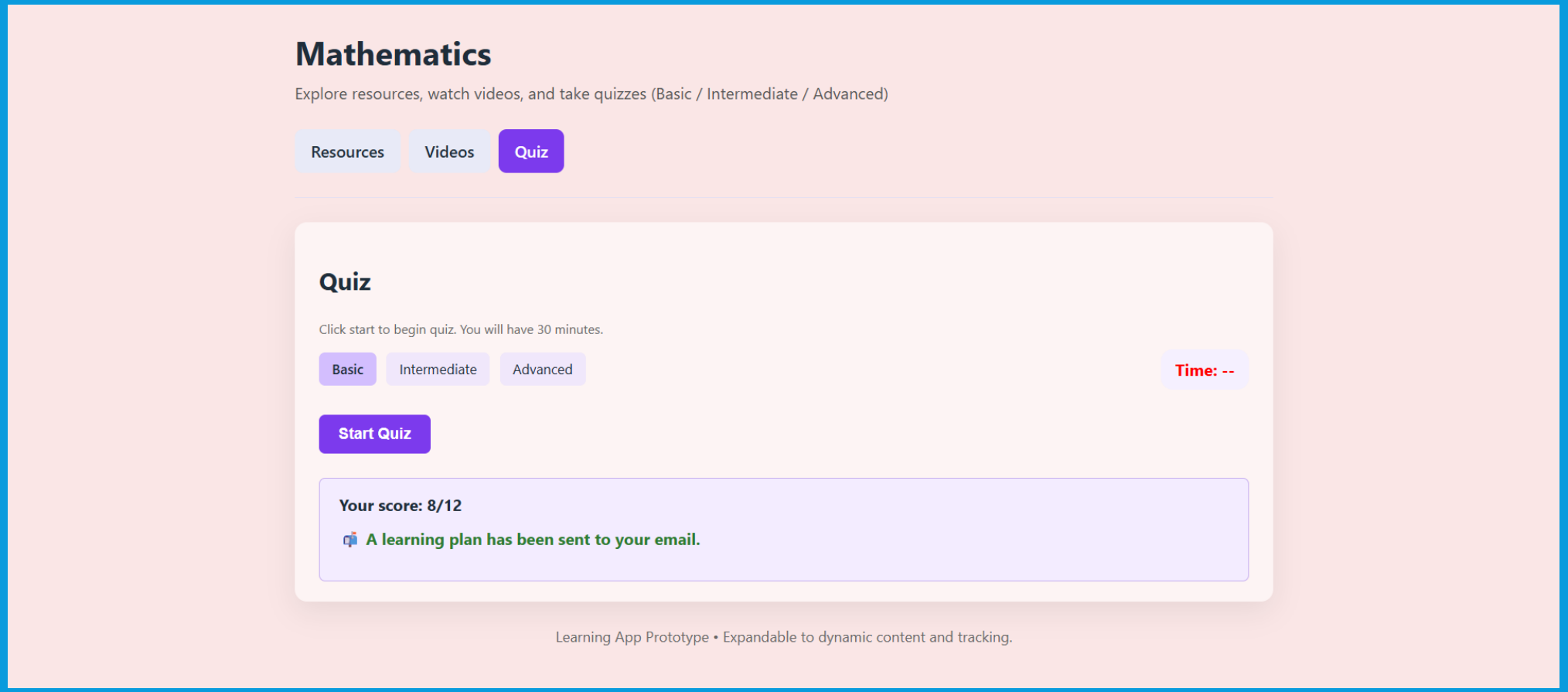
QUIZ INTERFACE

PART 2



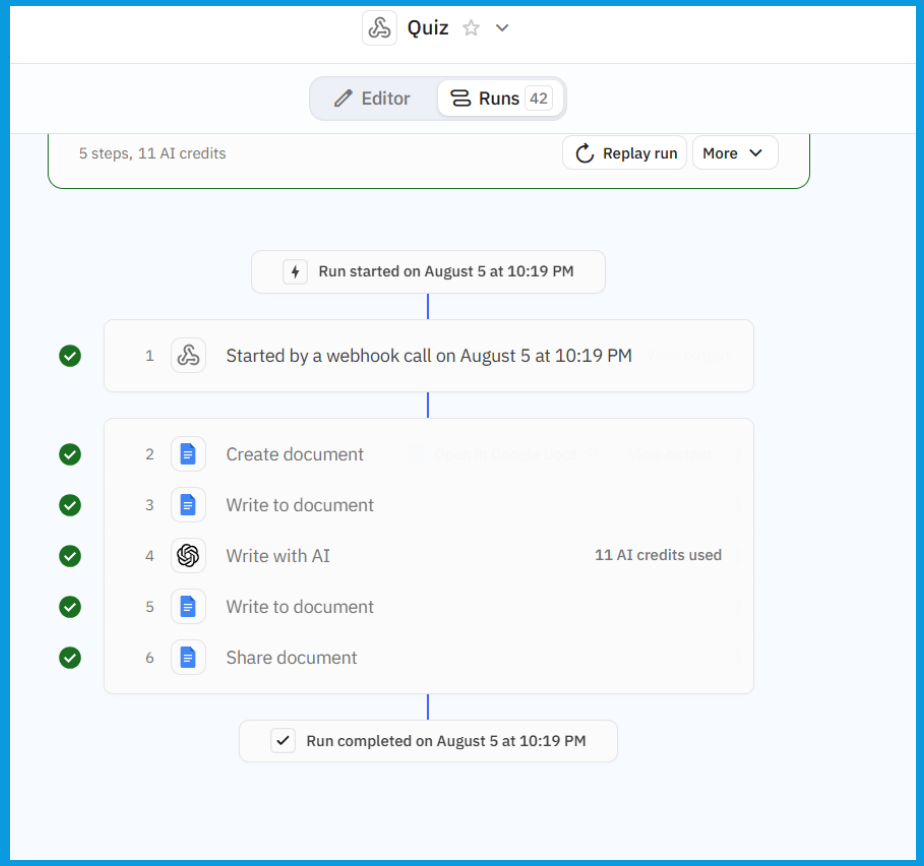
QUIZ SUBMISSION AND RELAY TRANSFER

PART 3



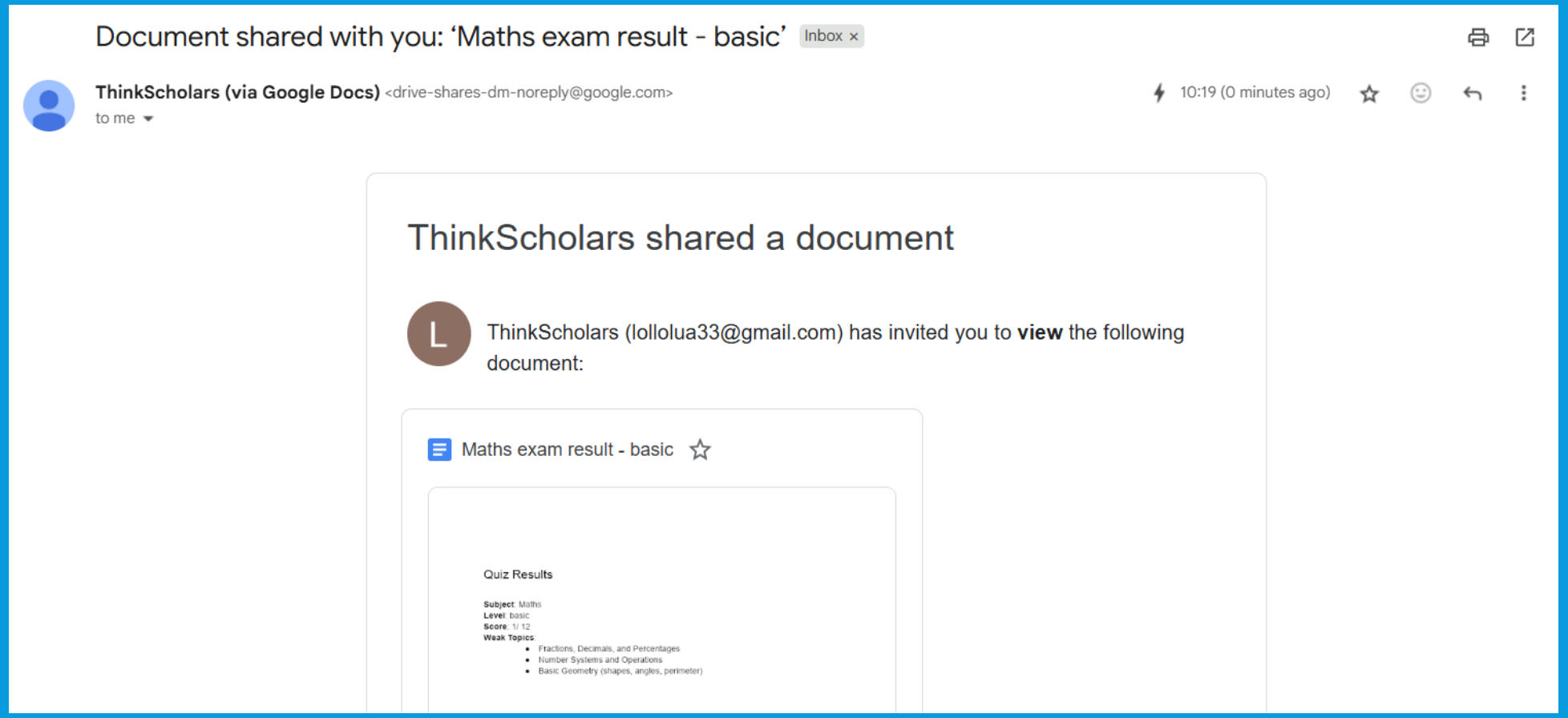
RELAY PROCESSING AND DOCUMENT GENERATION

PART 4



DOCUMENT SENT TO EMAIL

PART 5



RESPECTIVE LEARNING GUIDE FOR STUDENT

PART 6

Quiz Results

Subject: Maths
Level: basic
Score: 7/ 12
Weak Topics:

- Basic Geometry (shapes, angles, perimeter)
- Fractions, Decimals, and Percentages
- Number Systems and Operations

Personalized Learning Plan

Learning Plan Based on Your Quiz Results

Great job completing your quiz! Here's a focused learning plan to help you strengthen the areas where you can improve. Let's work step by step on each topic—you're on your way to mastering these concepts!

1. Basic Geometry (Shapes, Angles, Perimeter)

Goal: Recognize shapes, understand types of angles, and calculate perimeter.

Practice Questions:

1. Name three shapes with four sides.
2. What is the perimeter of a rectangle with sides 5 cm and 8 cm?
3. Draw and label an acute, right, and obtuse angle.
4. If a triangle has sides of 3 cm, 4 cm, and 5 cm, what is its perimeter?
5. Which shape has only one pair of parallel sides: square, rectangle, or trapezoid?

Helpful Links:

- Khan Academy: Geometry Basics
- BBC Bitesize: 2D Shapes
- Math is Fun: Angles

2. Fractions

Goal: Understand and manipulate fractions—compare, add, subtract.

Practice Questions:

1. Write 3/4 as a decimal.
2. Which is bigger: 2/3 or 3/5?
3. Add: 2/5 + 1/5
4. Subtract: 4/7 - 2/7
5. Simplify: 6/8

Helpful Links:

- Khan Academy: Intro to Fractions
- Math is Fun: Fractions
- SplashLearn: Fractions Games and Practice

3. Decimals and Percentages

Goal: Convert between decimals and percentages, and use them in calculations.

Practice Questions:

1. Write 0.75 as a percentage.
2. What is 25% as a decimal?
3. Is 0.5 equal to 50%?
4. What is 20% of 50?
5. Convert 3/10 to a decimal.

Helpful Links:

- Khan Academy: Decimals and Percents
- BBC Bitesize: Decimals and Percentages
- IXL: Decimals and Percents Practice

4. Number Systems and Operations

Goal: Identify types of numbers, and practice addition, subtraction, multiplication, and division.

Practice Questions:

1. Write if 7, 0, and −3 are natural, whole, or integer numbers.
2. What is 12 + 8 − 5?
3. Multiply: 6 × 7
4. Divide: 21 ÷ 3
5. Which number is an even number: 13, 14, 15?

Helpful Links:

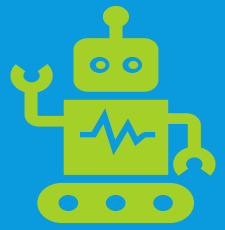
- Khan Academy: Place Value & Number Systems
- Math is Fun: Numbers
- BBC Bitesize: Number Skills

Keep practicing, and remember—every expert started as a beginner. You're getting better every day!

VISIT OUR WEB APP

- **Website Link:** https://github.com/AkshayS80/IBM-project
- **Try It Yourself!**
  - Explore quizzes, submit answers, and receive real-time feedback
  - Experience how fast and personalized learning can be.

CONCLUSION



Summary:

Built a modular quiz-feedback system using JSON, Relay, and automated PDF generation.

Integrated AI to auto-generate questions and deliver smart, personalized feedback.

Designed to reduce teacher workload and adapt to individual learning needs.

Future Work:

Add gamification and student dashboards for engagement and self-tracking.

Expand analytics for teachers: view class trends, weak areas, and improvement metrics.

THANK YOU