# Final Project Report for AI-Assisted Tax Preparation Tool

## Project Title:

AI-Assisted Tax Preparation Tool

## Team:

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## Overview

The AI-Assisted Tax Preparation Tool is a web-based platform designed to help Canadian taxpayers calculate estimated taxes, receive tailored deductions and credit advice, and engage in conversation with an AI tax assistant. It combines rule-based logic, optimization algorithms, and GPT-based AI for practical personal finance assistance.

## Key Features

* ✅ Rule-based suggestions for deductions: tuition, dependents, childcare, GST/HST.
* 🧑‍🔬 AI chatbot assistant for tax questions using GPT-3.5.
* 📊 RRSP optimization algorithm based on income and RRSP limit.
* 📅 Historical record storage via Firebase Firestore.
* ✏️ Form-based input UI with chatbot integration.

## Tech Stack

* Frontend: React + TypeScript
* Backend: NestJS (TypeScript)
* AI: OpenAI (gpt-3.5-turbo)
* Database: Firebase Firestore
* Testing: Jest with mocked dependencies
* Deployment: Localhost, planned for Firebase Hosting

## How It Works

1. User Input: Taxpayer fills out form fields (income, rrsp, tuition, dependents, childcare).
2. Backend Calculation:  
   - `calculateTax.ts` computes tax owed, deductions, and credits.  
   - GPT-based tips are generated using the user input context.
3. Suggestions Service:  
   - Combines rule-based and AI-generated tips.  
   - Stores the results to Firebase.
4. Chatbot:  
   - User can ask follow-up questions.  
   - Responses are generated via GPT with full context retained in the frontend.

## Screenshots

* [ ] Form input page
* [ ] Suggestions response page
* [ ] Chatbot interaction demo
* [ ] Firebase Firestore document view

## Challenges

* Handling null input data in chatbot and tax logic.
* Designing accurate and simple rule-based deductions.
* Integrating GPT responses into suggestions pipeline.
* Testing with mocked AI and database services.

## Future Improvements

* Integrate real authentication and user management.
* Deploy to Firebase Hosting.
* Add export-to-PDF functionality for tax reports.
* Enhance chatbot with retrieval-augmented generation (RAG) using CRA guidelines.

## Final Checklist

* [x] Rule-based engine and GPT tips integration
* [x] Working chatbot (tested via Postman + frontend)
* [x] Firebase integration (save + retrieve + clear history)
* [x] Frontend form + chatbot UI
* [x] Final README and code organization

## Project Link

GitHub Repo: https://github.com/ChloeLeeFullStackDeveloper/ai\_tax\_preparation\_tool