

# CAPSTONE PROJECT

## AI-POWERED STUDENT GUIDE FOR RESEARCH ASSISTANCE

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# OUTLINE

- **Problem Statement** (Should not include solution)
- **Proposed System/Solution**
- **System Development Approach** (Technology Used)
- **Algorithm & Deployment**
- **Result (Output Image)**
- **Conclusion**
- **Future Scope**
- **References**

# PROBLEM STATEMENT

- In today's academic environment, students often struggle with conducting proper research due to limited understanding of complex topics, poor citation practices, and lack of access to personalized guidance. This challenge is especially severe for students from non-English backgrounds or those with limited exposure to academic writing. Manual tasks such as searching for relevant papers, summarizing content, organizing references, and drafting project sections are time-consuming and overwhelming. As a result, many students find research intimidating and lose motivation. There is a pressing need for a system that simplifies the research process, especially for beginners, while also providing continuous support in clear and easy-to-understand language.

# PROPOSED SOLUTION

We propose an AI-powered Research Agent that acts as a friendly guide for students.

This bot can:

- Search for academic papers
- Summarize documents in simple English
- Organize references automatically
- Assist in writing emails, resumes, and research sections
- Motivate students with jokes, quotes, and kind support

Features include:

- Step-by-step support
- Simple language instructions
- Personalized responses
- Interactive and friendly tone

# SYSTEM APPROACH

The project is developed using:

- IBM Cloud Lite services
- IBM Granite AI models
- Natural Language Processing (NLP) for understanding queries
- Custom APIs for PDF summarization and reference management

# ALGORITHM & DEPLOYMENT

## Algorithm Selection

- NLP-based summarization model
- Intent detection using pretrained transformers
- Rule-based flow for guiding conversation

## Data Input

- Student question or uploaded research paper
- Resume or email content for review

## Training/Process

- Fine-tuned prompts for IBM Granite
- Context-based response generation

## Deployment

- Hosted on IBM Cloud Lite environment
- Front-end connected to backend API services

# RESULT



You 04:45 PM

how can help you



Guide with SVK 04:45 PM

😊 I'm here to help you with various aspects of your college career and beyond. Here are some ways I can assist you:

1. **Study help:** If you're struggling with a particular subject or topic, I can try to explain it in simple terms or provide resources for further learning.
2. **Career advice:** I can help you explore different career options, provide tips on resume writing, and offer guidance on how to prepare for job interviews.
3. **Internship and job search:** I can assist you in searching for internships or job opportunities, and provide advice on how to apply and increase your chances of getting hired.
4. **Resume and email writing:** I can help you craft a strong resume and cover letter, and provide tips on how to write effective emails to potential employers or academic institutions.
5. **Project ideas:** If you're looking for ideas for a project or research paper, I can try to suggest some topics or provide guidance on how to get started.
6. **Life skills and motivation:** I can offer advice on time management, productivity, and goal setting, as well as provide motivational quotes and encouragement to help you stay focused and driven.
7. **Fun talk and jokes:** If you just need someone to chat with or want to hear a joke to brighten your day, I'm here for that too! 😊

# RESULT



You 04:49 PM

Study help for WEB DEVELOPMENT



Guide with SVK 04:49 PM



I'd be happy to help you with study help for Web Development. Here are some resources and topics to get you started:

1. **HTML/CSS:** Learn the basics of HTML (Hypertext Markup Language) and CSS (Cascading Style Sheets) to build a strong foundation in web development.
2. **JavaScript:** Understand the fundamentals of JavaScript, including variables, data types, functions, and object-oriented programming.
3. **Front-end frameworks:** Explore popular front-end frameworks like React, Angular, or Vue.js to build dynamic and interactive user interfaces.
4. **Back-end development:** Learn about server-side programming languages like Node.js, Ruby, or PHP, and frameworks like Express, Ruby on Rails, or Laravel.
5. **Databases:** Understand how to design and interact with databases using SQL (Structured Query Language) or NoSQL databases like MongoDB.



# RESULT



You 04:51 PM

Carreer Advice for me I am college Pre final year student



Guide with SVK 04:51 PM

📖 As a pre-final year college student, you're at a crucial stage in your academic and professional journey. Here are some career advice and suggestions to help you make the most of your final year and beyond:

1. **Internships:** Apply for internships in your field of interest to gain practical experience, build your network, and enhance your resume.
2. **Skill development:** Focus on developing in-demand skills in your industry, such as programming languages, data analysis, digital marketing, or cloud computing.
3. **Networking:** Attend career fairs, industry events, and networking sessions to connect with professionals in your field and learn about job opportunities.
4. **Resume building:** Update your resume to highlight your academic achievements, skills, and any relevant work experience or projects.
5. **Career counseling:** Seek guidance from your college's career counseling services or a professional career coach to help you explore career options and create a personalized career plan.

# CONCLUSION

- The Research Agent project demonstrates how AI can play a transformative role in guiding students through their academic and research journeys. By simplifying complex information, summarizing research papers, and supporting students with writing tasks, the system improves learning outcomes—especially for those with limited English proficiency. Leveraging IBM Cloud Lite and IBM Granite technologies, the AI assistant offers a friendly, personalized experience that saves time and reduces research barriers. This solution not only enhances academic efficiency but also encourages curiosity, independence, and innovation among students.

# FUTURE SCOPE

- Add voice input/output for accessibility
- Integrate with Google Scholar for real-time research fetching
- Provide subject-wise expert modes (Math, Science, etc.)
- Expand language support for regional students
- Add internship and scholarship discovery features

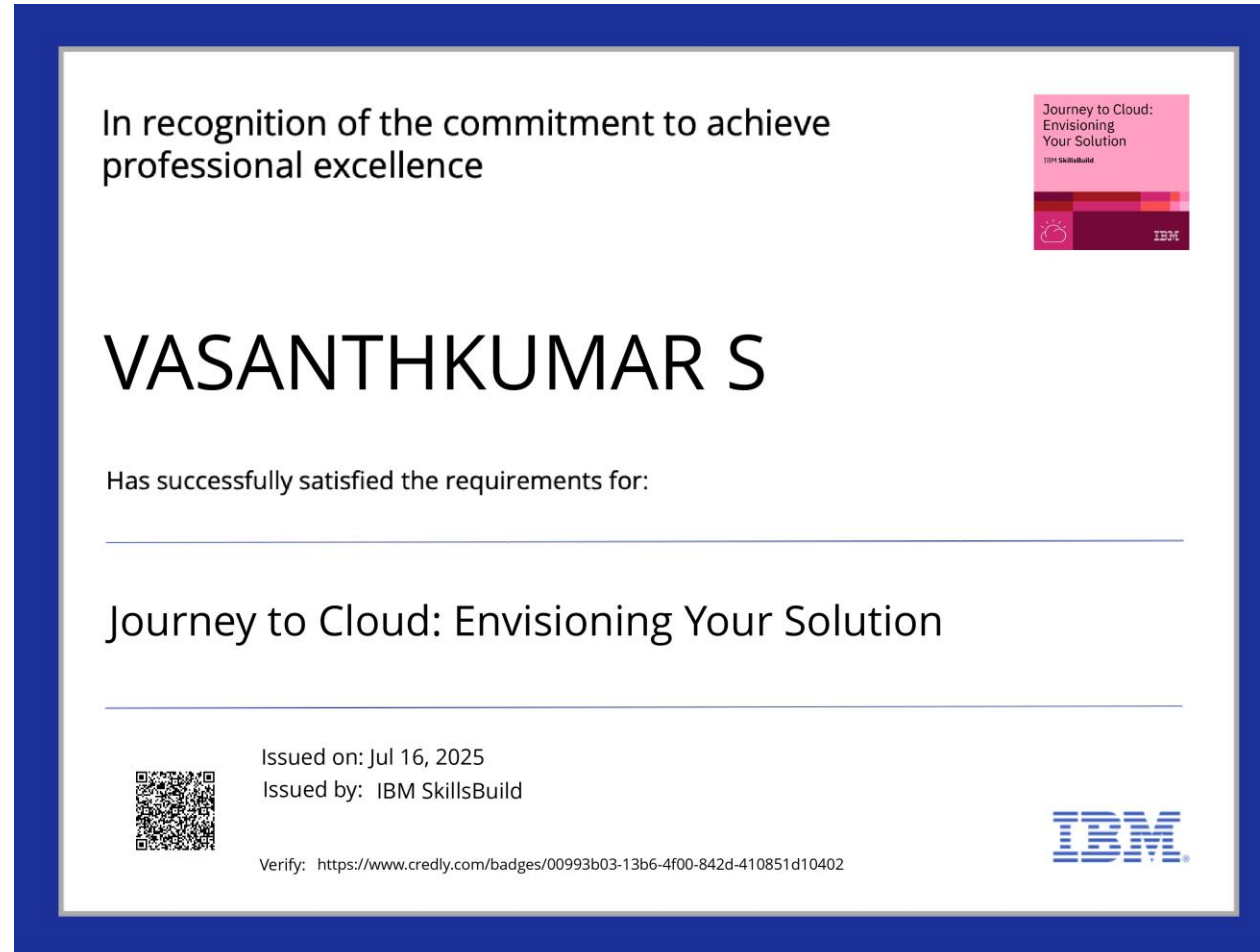
# REFERENCES

- IBM Granite Documentation
- NLP: Natural Language Toolkit (NLTK)
- Transformer Models (HuggingFace)
- AI Chatbot Design for Education – IEEE Paper
- [IBM Cloud](#)
- [IBM watsonx.ai](#)

# IBM CERTIFICATIONS



# IBM CERTIFICATIONS



# IBM CERTIFICATIONS

**IBM SkillsBuild**

Completion Certificate



This certificate is presented to

VASANTHKUMAR S

for the completion of

**Lab: Retrieval Augmented Generation with  
LangChain**

(ALM-COURSE\_3824998)

According to the Adobe Learning Manager system of record

**Completion date:** 16 Jul 2025 (GMT)

**Learning hours:** 20 mins



**THANK YOU**