

CAPSTONE PROJECT

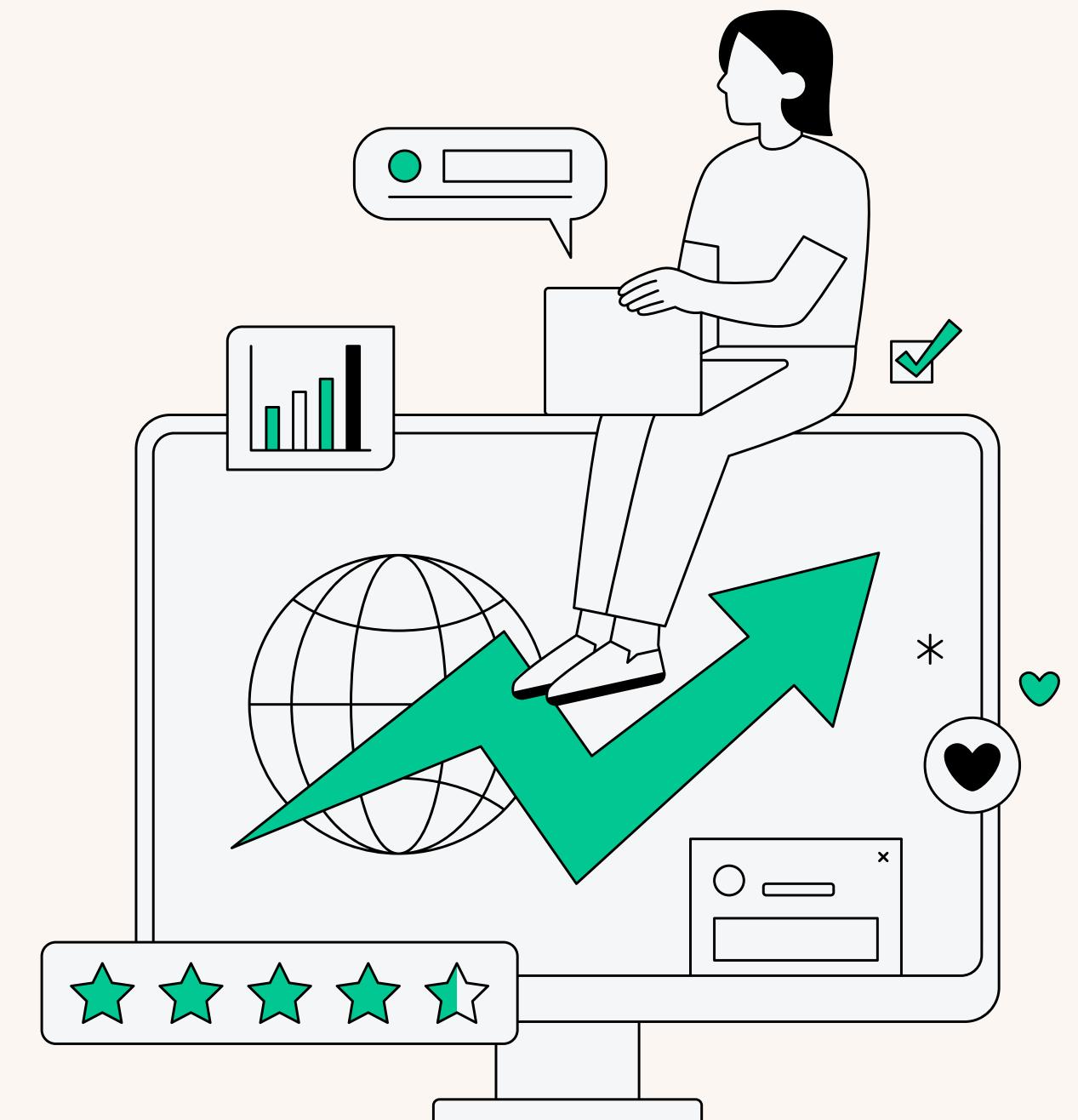
Agentic Career Counseling Companion

Presented By : Shreyasi Datta

Student name : Shreyasi Datta

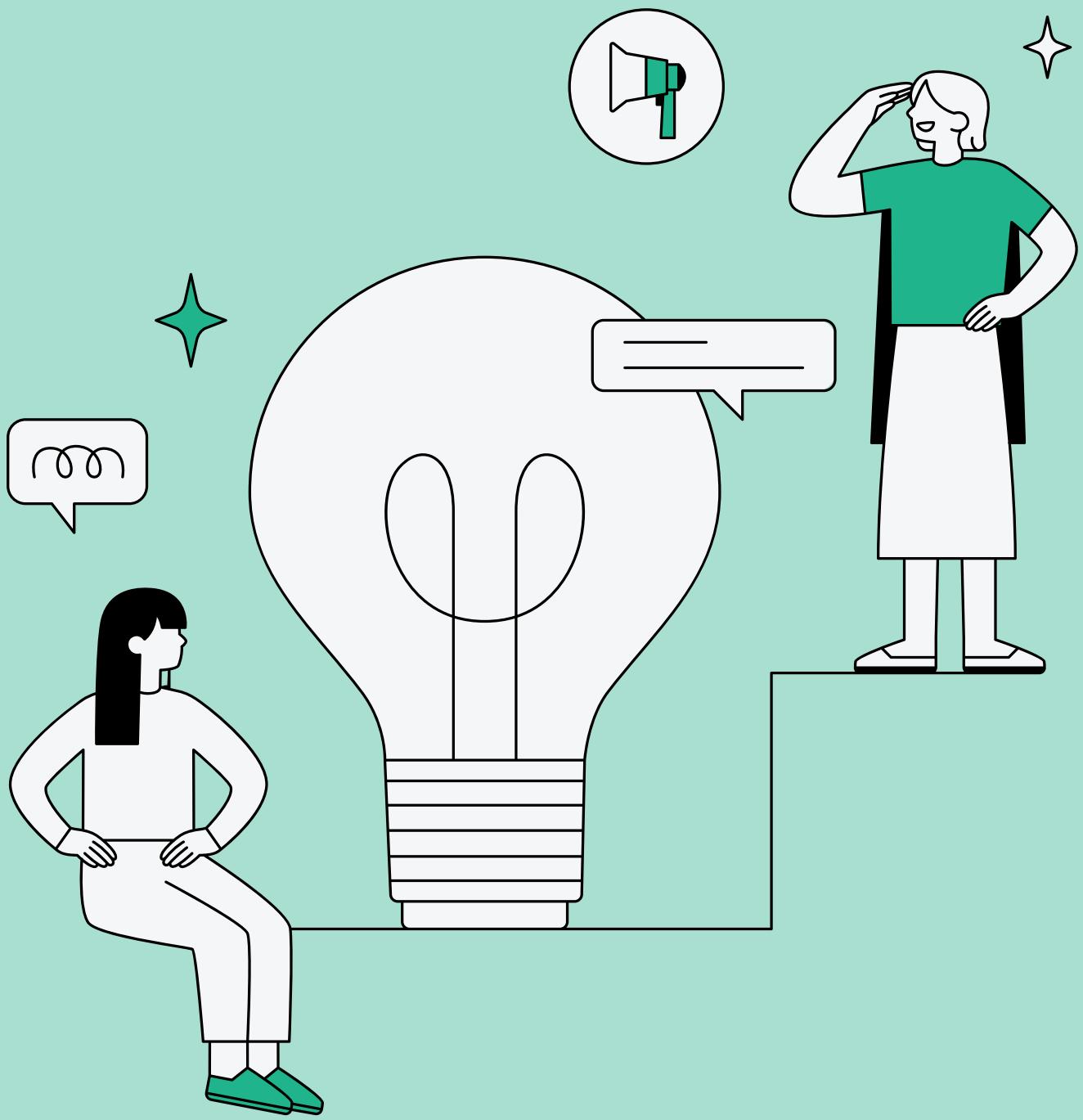
College Name : Institute of Engineering & Management

Department : Computer Science Engineering



OUTLINE

- Problem Statement
- Technology used
- Wow factor
- End users
- Result
- Conclusion
- Git-hub Link
- Future scope
- IBM Certifications



PROBLEM STATEMENT

Students often struggle to make informed career decisions due to fragmented access to guidance, limited self-awareness of academic strengths, and rapidly evolving industry landscapes. Traditional counseling methods lack personalization and scalability, leading to missed opportunities and career mismatches.

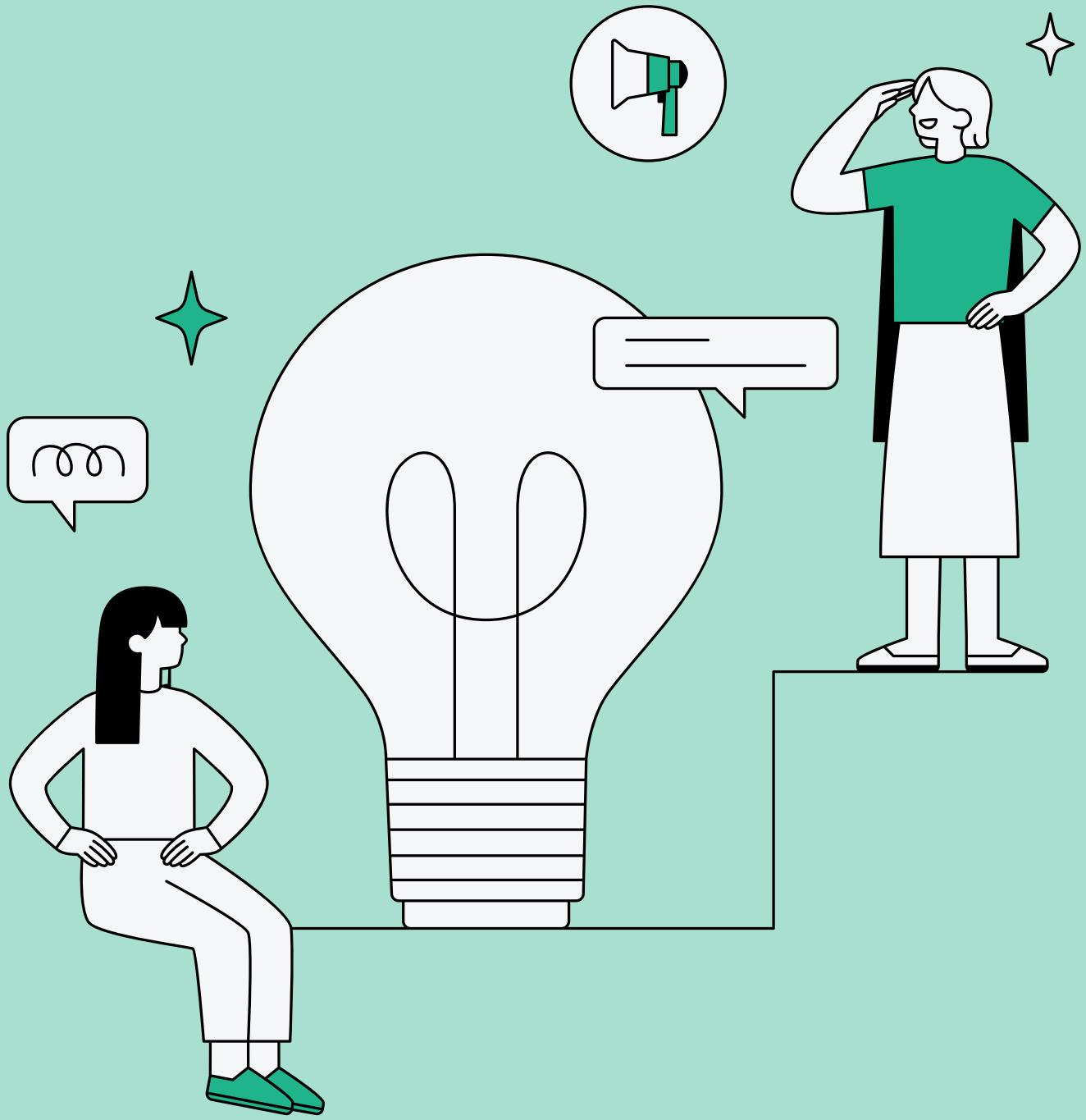
Proposed Solution

An intelligent, autonomous AI Career Counseling Agent that continuously monitors student performance, evolving interests, and real-time labor market trends to deliver tailored career pathway suggestions. This empowers students to make confident, future-ready decisions with minimal dependency on manual intervention.



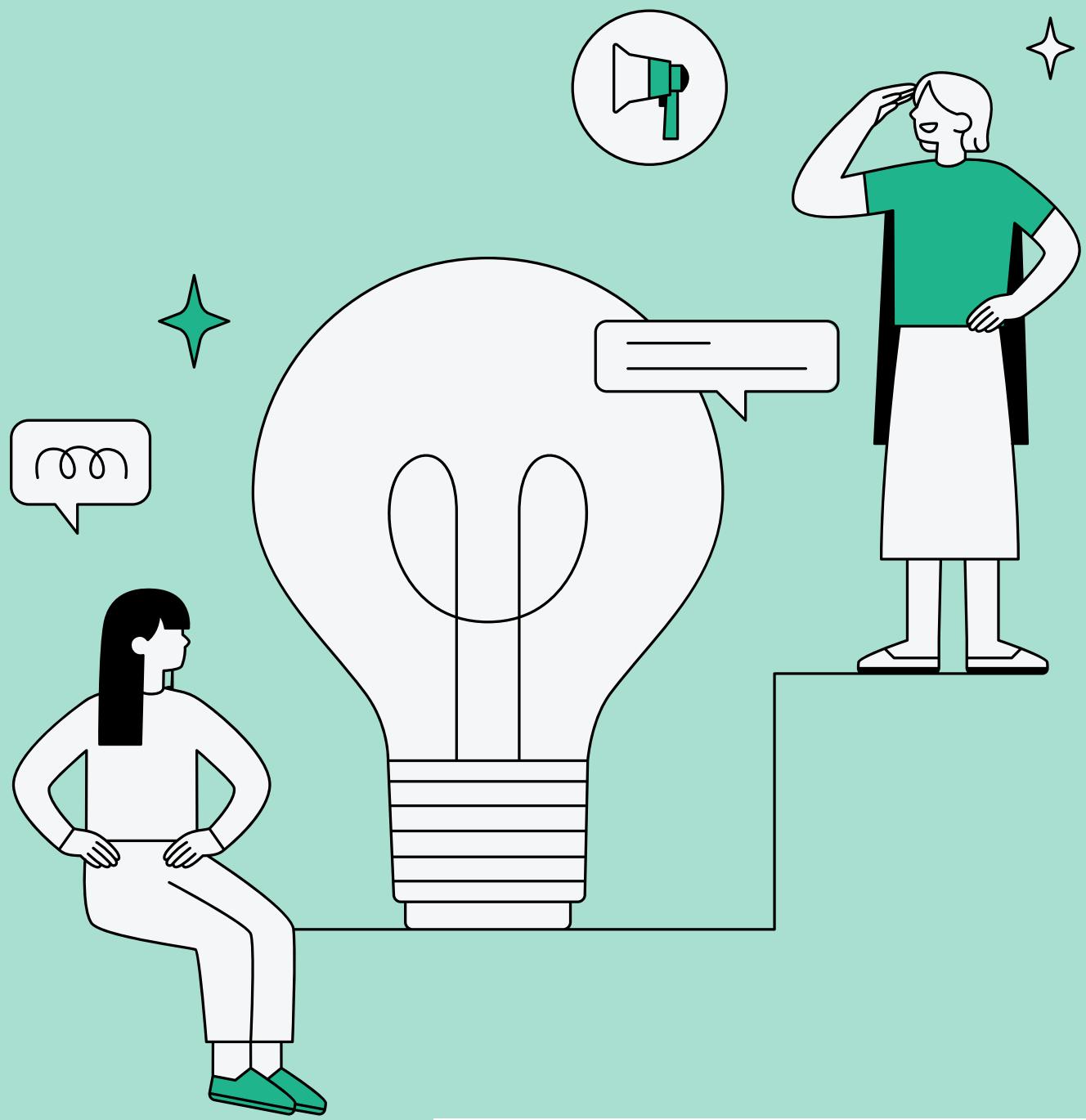
TECHNOLOGY USED

- IBM Cloud Lite Services
- Natural Language Processing (NLP)
- Retrieval Augmented Generation (RAG)
- IBM Granite Foundation Model
- Machine Learning Algorithms
- Real-time Data Analytics
- Conversational AI



IBM CLOUD SERVICES USED

- IBM Cloud Watsonx AI Studio - For building and training the AI agent
- IBM Cloud Watsonx AI Runtime - For deploying and running the agent
- IBM Cloud Agent Lab - For agent development and testing
- IBM Granite Foundation Model - Core AI capabilities for conversation and reasoning
- IBM Watson Natural Language Understanding - For analyzing student responses and interests
- IBM Cloud Databases - For storing student profiles and career data



WOW FACTORS

This agent will revolutionize career counseling by providing personalized, data-driven guidance that adapts to each student's unique profile and market conditions in real-time.

Unique Features:

- Intelligent Student Profiling: Dynamic assessment of academic performance, interests, and personality traits
- Real-time Market Analysis: Continuous monitoring of job market trends, salary data, and skill demands
- Personalized Career Pathways: Custom-tailored career recommendations based on individual strengths and market opportunities
- Skills Gap Analysis: Identifies missing skills and suggests learning resources to bridge gaps
- Interactive Career Exploration: Conversational interface for exploring different career options
- Progress Tracking: Monitors student development and adjusts recommendations accordingly
- Industry Mentor Matching: Connects students with relevant industry professionals
- Predictive Career Modeling: Uses AI to forecast career success probability in different fields

END USERS

- High School Students - Making initial career decisions and college major selections
- College Students - Exploring specializations and internship opportunities
- Career Changers - Professionals seeking new career directions
- Educational Institutions - Schools and colleges implementing systematic career guidance
- Parents and Guardians - Supporting their children's career decision-making process
- Career Counselors - Enhancing their counseling capabilities with AI insights

RESULTS

Share feedback β | Unsaved | New agent + | Deploy

You: 08:10 PM
my gpa is 3 , but iam interested in taking science what should i do?

watsonx Agent 08:10 PM
Given your current GPA and interest in science, there are still several career paths you can consider. Here are some options based on the research I've conducted:

1. Healthcare Support Roles: With a low GPA, you might want to consider roles that require less stringent academic credentials but still allow you to work in the healthcare field. Some options include:

- Emergency Medical Technician (EMT) or Paramedic
- Medical Sonographer
- Phlebotomist
- Medical Assistant

2. Research or Laboratory Support: If you're interested in a scientific career, you could look into roles that support research or work in laboratories. These might include:

- Laboratory Technician
- Research Assistant
- Clinical Research Coordinator

3. Data Analysis or Science Writing: If you have a knack for numbers or writing, you

Type something... ⟳ ▶

Share feedback β | Unsaved | New agent + | Deploy

Agent preview

- Research Assistant
- Clinical Research Coordinator

3. Data Analysis or Science Writing: If you have a knack for numbers or writing, you might consider:

- Data Analyst
- Science Writer or Editor
- Technical Writer

4. Alternative Science Careers: There are careers in science-related fields that may not require a high GPA:

- Environmental Consultant
- Patent Agent (with a background in a science field)
- Science or Health Educator

5. Further Education: Improving your GPA through additional coursework or earning a higher degree could open more doors. Consider:

- Post-baccalaureate programs
- Online or part-time degree programs

6. Networking and Soft Skills: Building a strong network and developing soft skills such as communication, teamwork, and problem-solving can be crucial in securing a job, regardless of GPA.

Share feedback β | Unsaved | New agent + | Deploy

Agent preview

higher degree could open more doors. Consider:

- Post-baccalaureate programs
- Online or part-time degree programs

6. Networking and Soft Skills: Building a strong network and developing soft skills such as communication, teamwork, and problem-solving can be crucial in securing a job, regardless of GPA.

Remember, while a low GPA can present challenges, it doesn't necessarily dictate your career path. Many successful professionals have overcome similar hurdles by focusing on relevant skills, experiences, and networking. It's essential to highlight transferable skills and any relevant work experience or projects, especially those demonstrating your passion for science.

To further personalize these recommendations, I would need more information about your specific interests within science, any relevant work experience, and soft skills. Additionally, considering additional education or certifications could help bolster your profile for more competitive roles.

It's also worth noting that some careers, particularly in healthcare, may have minimum GPA requirements. Always check the specific prerequisites for any career path you're considering.

▶ How did I get this answer?

Type something... ⟳ ▶

ENG 20:12

RESULTS

You: 08:19 PM
I'm a junior studying Environmental Science with a 3.4 GPA. I'm passionate about climate change but unsure if I should pursue research, policy work, or private sector sustainability roles. I have research experience but limited work experience. I need to decide on summer plans and post-graduation direction. Can you analyze my situation, research current market opportunities, and provide specific next steps?

watsonx Agent 08:19 PM
Current Assessment:

- Academic Performance:** You are a junior with a 3.4 GPA in Environmental Science.
- Passion & Experience:** You have a strong passion for climate change and relevant research experience.
- Work Experience:** Limited practical work experience.
- Decision Point:** Need to decide on summer plans and post-graduation direction.

Market Context:

- Growing Demand for Climate-Related Roles:** The World Economic Forum's "Future of Jobs Report 2025" highlights climate change mitigation as a significant transformative trend, expected to drive labor market changes through 2030.
- Versatile Career Opportunities:**

- Research:** Environmental scientists and specialists are projected to see an 8% growth (as fast as average) through 2030 (BLS).

Type something... Show desktop

Agent preview

2. Versatile Career Opportunities:

- Research:** Environmental scientists and specialists are projected to see an 8% growth (as fast as average) through 2030 (BLS).
- Policy:** Master's programs in Environmental Policy or related fields at institutions like Columbia SIPA offer concentrations in Climate, Energy, and Environment.
- Private Sector Sustainability:** Companies are increasingly focusing on 'greening' their operations and reducing their carbon footprint, creating roles in environmental engineering and sustainability.

3. Skills in Demand: There is a growing need for professionals who can analyze environmental issues, develop sustainable solutions, and implement climate change mitigation strategies.

Recommended Pathways:

- Research Pathway:**
 - Rationale:** Leverage your existing research experience and passion for climate change.
 - Action Steps:**
 - Apply for summer research internships at universities or research institutions focusing on climate change.
 - Consider pursuing a Master's in Environmental Science or a related field with a focus on climate change.

Agent preview

Success Metrics & KPIs:

- Student Engagement:** Regular interaction with mentors, attending webinars, and networking events.
- Recommendation Accuracy:** Track alignment of chosen pathway with long-term career satisfaction and success.
- Skill Gap Closure:** Measure acquisition of in-demand skills through coursework, projects, and internships.
- Early Intervention Success:** Identify and address any mismatches early through feedback loops and adjustments in the chosen pathway.

Next Steps:

- Self-Reflection:** Reflect on which pathway resonates most with your long-term goals and immediate interests.
- Research Opportunities:** Look into specific universities, research labs, and companies offering summer programs.
- Networking:** Connect with professionals in each field through LinkedIn, alumni networks, or industry events.
- Skill Development:** Begin acquiring or enhancing skills relevant to your chosen pathway, such as data analysis, policy writing, or engineering design.

Agent preview

- Success Metrics:** Publications, research grants, invitations to present at conferences.

2. Policy Pathway:

- Rationale:** Align with your interest in influencing environmental policy.
- Action Steps:**
 - Seek internships with government agencies, NGOs, or think tanks focused on climate policy.
 - Enroll in a Master's in Public Administration (MPA) or Environmental Policy with a concentration in climate change.
- Success Metrics:** Policy briefs authored, contributions to policy discussions, roles in advocacy campaigns.

3. Private Sector Sustainability Pathway:

- Rationale:** Utilize your scientific background in a practical, industry-driven setting.
- Action Steps:**
 - Apply for summer internships in environmental consulting, corporate sustainability departments, or green technology firms.
 - Consider a Master's in Environmental Engineering or a related field with a focus on sustainability.

RESULTS:- Deployed AI Agent

The screenshot displays the IBM WatsonX AI Agent interface. At the top, there's a navigation bar with 'IBM watsonx' on the left, followed by 'Upgrade', a help icon, a notification bell, 'Shreyasi Datta's Account', 'Dallas', and a user profile icon. Below the navigation bar, the URL 'Deployment spaces / agent / watsonx Agent /' is visible, along with various icons for file operations.

The main area shows a conversation between a user ('You') and the 'watsonx Agent'. The user asks about becoming a Product Manager as a Computer Science student. The AI agent responds with a structured plan:

- Current Assessment:**
 - Strengths:** Strong technical foundation in Computer Science.
 - Areas for Development:** Business acumen, strategic thinking, leadership, and soft skills like communication and stakeholder management.
- Market Context:** Product Management is a cross-functional role requiring technical knowledge and business strategy. According to PMI, demand is expected to grow by 14% by 2030.
- 4. Build a Portfolio:**
 - Document projects showcasing strategic thinking, leadership, and cross-functional management.
- Timeline Planning:**
 - Short-term (1-2 semesters):** Focus on business courses, leadership roles, and communication skills.
 - Mid-term (2-3 semesters):** Pursue certifications, engage in agile methodologies, and build a project portfolio.
 - Long-term (1-2 years post-graduation):** Aim for Product Management internships or entry-level roles, continuously refine skills based on feedback and market trends.

The AI agent concludes by encouraging regular reassessment and good luck on the journey to becoming a Product Manager.

On the right side of the interface, there's a sidebar titled 'Recommended Pathways' with three sections: 1. Business Acumen, 2. Strategic Thinking, and 3. Leadership & Team Management. Each section lists 'Action Steps' and 'Success Metrics'.

At the bottom of the interface, there's a footer with the 'edunet foundation' logo.

RESULTS:- Deployed AI Agent

IBM watsonx

Deployment spaces / agent / watsonx Agent /

Watsonx Agent Deployed Online

API reference Test Preview

Enter input data

Text JSON

Text input and .csv files are not supported for this deployment because it does not have an input schema defined.

Manually enter or upload a file containing input data in JSON format. Max file size is 50 MB.

Browse local files ↗ Search in space ↗

```
{ "messages": [ { "role": "user", "content": "Hi, I'm a sophomore struggling with my major choice. Can you help me think through my options?" } ] }
```

The screenshot shows the IBM Watsonx Test interface. On the left, there's a sidebar with navigation links like 'Deployment spaces', 'agent', and 'watsonx Agent'. Below that is the 'Watsonx Agent' card, which is 'Deployed' and 'Online'. Underneath the card are tabs for 'API reference', 'Test' (which is selected), and 'Preview'. The main area is titled 'Enter input data' and has a 'Text' tab (disabled) and a 'JSON' tab (selected). It says 'Text input and .csv files are not supported for this deployment because it does not have an input schema defined.' Below that, it says 'Manually enter or upload a file containing input data in JSON format. Max file size is 50 MB.' There are buttons for 'Browse local files' and 'Search in space'. At the bottom, there's a JSON code block: { "messages": [{ "role": "user", "content": "Hi, I'm a sophomore struggling with my major choice. Can you help me think through my options?" }] }. The right side of the interface is a large, empty white space.

```
[ "choices": [ { "index": 0, "message": { "content": "Of course, I'd be happy to assist you. To provide the best guidance, I need to understand your current academic performance, interests, skills, and any other relevant information. Could you share your recent grades, subjects you enjoy the most, subjects you find challenging, and any extracurricular activities you're involved in?\n\nMeanwhile, I'll gather some general labor market insights to give you a sense of current trends.\n\n[\"arguments\": {\"q\": \"current college major trends\"}, \"name\": \"GoogleSearch\"]"}, "role": "assistant" } ] }
```

RESULTS - Deployed AI Agent

The screenshot shows the IBM WatsonX Agent interface. At the top, there's a navigation bar with 'IBM watsonx' (with a dropdown arrow), 'Upgrade', a help icon, a notifications icon, and 'Shreyasi Datta's'. Below this is a sub-navigation bar with 'Deployment spaces / agent / watsonx Agent /' and tabs for 'API reference', 'Test' (which is selected), and 'Preview'. A large text area titled 'Enter input data' contains a JSON message from the user: { "messages": [{ "role": "user", "content": "I'm a sophomore studying Computer Science. My GPA is 3.6, I'm strong in programming (Python, Java) but struggle with theoretical math courses. I love building apps and recently won a hackathon. I'm interested in both software development and entrepreneurship. What insights can you provide about my profile?" }] }. To the right of this, a large JSON response is displayed:

```
{ "choices": [ { "index": 0, "message": { "content": "Based on your profile, you have a solid foundation in Computer Science with a focus on programming skills in Python and Java. Your strong performance in practical, hands-on projects, such as building apps and winning a hackathon, indicates a knack for software development. However, you've mentioned struggling with theoretical math courses, which could be a consideration in more research-oriented or mathematically intensive subfields of Computer Science.\n\nYour interest in both software development and entrepreneurship suggests a dual career path could be suitable. Here are some insights and recommendations:\n\n1. **Software Development**: Given your proficiency in programming, you could pursue a career as a software developer or engineer. Roles in this field include:\n    - **Software Developer**: Focuses on coding and developing software applications.\n    - **Full-stack Developer**: Handles both front-end and back-end development.\n    - **Mobile Application Developer**: Specializes in developing apps for iOS or Android platforms.\n    - **Game Developer**: Designs and develops video games.\n\n2. **Entrepreneurship**: Your interest in entrepreneurship combined with your technical skills positions you well for starting your own tech venture. You could consider roles like:\n    - **Tech Entrepreneur**: Starting your own tech company or product.\n    - **Product Manager**: Oversees the development and sometimes the launch of a product.\n\n3. **Startup Founder**: Leading a new company, often in a tech-related space.\n\nAction Steps:\n1. **Skill Enhancement**: Consider taking additional courses or workshops to bolster your theoretical math skills, which could open doors to more specialized roles or research opportunities.\n2. **Learn Additional Technologies**: Explore frameworks, databases, or cloud platforms relevant to your interests (e.g., AWS, Google Cloud, React, Node.js).\n3. **Networking and Experience**: Engage with peers and mentors in your university's tech clubs or societies.\n4. **Internships**: Seek internships at tech companies to gain real-world experience and industry exposure.\n5. **Open Source Contributions**: Contribute to open-source projects to build your portfolio and collaborate with experienced developers.\n6. **Entrepreneurial Ventures**: Start brainstorming business ideas that leverage your technical skills.\n7. **Business Plan**: Develop a business plan for your ideas, focusing on market needs, competition, and revenue models.\n8. **Incubators/Accelerators**: Look into university or external incubators/accelerators that support student startups.\n\nSuccess Metrics:\n- **GPA Improvement**: Aim to improve your GPA, particularly in math courses, to broaden your academic profile.\n- **Internship Secured**: Successfully securing an internship at a reputable tech company.\n- **Project Portfolio**: Building a robust portfolio of personal or open-source projects.\n- **Business Plan Validation**: Developing a validated business plan for your entrepreneurial idea.\n\nReassessment Points:\n- Reassess your career path annually, especially after significant academic achievements, internship experiences, or changes in market trends.\n- Consider seeking mentorship from professors, industry professionals, or entrepreneurs to gain insights and guidance.\n\nRemember, your career path is not set in stone, and you can always pivot based on your experiences, interests, and the evolving tech landscape.", "role": "assistant" } } ] }
```

At the bottom, there's a toolbar with icons for file operations, a search bar, and system status indicators (language: ENG IN, date: 06-08-2025, time: 21:02).



CONCLUSION

- Personalized Guidance: The agent provides tailored career advice based on individual student profiles and real-time market data
- Scalable Solution: Can serve unlimited students simultaneously, breaking traditional counseling limitations
- Data-Driven Decisions: Uses comprehensive analytics to ensure career recommendations are backed by market realities
- Continuous Learning: The agent improves its recommendations through ongoing interaction and feedback
- Accessibility: Available 24/7, making career guidance accessible to all students regardless of location or time constraints
- Future-Ready: Prepares students for evolving job markets by identifying emerging career opportunities

FUTURE SCOPE

- Advanced Psychometric Testing: Integration of comprehensive personality assessments
- Virtual Reality Career Exploration: Immersive experiences of different professional environments
- Blockchain Credentials: Secure verification of skills and achievements
- Global Mobility Guidance: International career opportunities and visa guidance
- Entrepreneurship Pathway: Specialized guidance for students interested in starting businesses
- Alumni Network Integration: Connecting students with successful alumni in their fields of interest
- Parent Dashboard: Comprehensive view for parents to track their child's career development
- Corporate Partnership Portal: Direct connections with companies for internships and job placements



IBM Certifications

In recognition of the commitment to achieve professional excellence



Shreyasi Datta
Getting Started with Artificial Intelligence

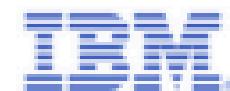
Has successfully satisfied the requirements for:



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professional excellence



Shreyasi Datta

Journey to Cloud: Envisioning Your Solution

Has successfully satisfied the requirements for:



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foundation

IBM Certifications :- RAG LAB certificate

IBM SkillsBuild

Completion Certificate



This certificate is presented to
Shreyasi Datta

for the completion of

**Lab: Retrieval Augmented Generation with
LangChain**

(ALM- COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 24 Jul 2025 (GMT)

Learning hours: 20 mins



github link : <https://github.com/ShreyasiDatta/Agentic-Career-Counseling-Companion>

Thank you very much!

