Assignment Brief – Agentic AI-Based System Development

Information Retrieval and Web Analytics (IT 3041)

Lecturer in Charge-
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Assignment Title:
Design and Implementation of an Agentic AI System Integrating LLMs, NLP, Security, and Information Retrieval

Assignment Overview

You are required to collaboratively **design and build a multi-agent AI-based system** that demonstrates **agentic behavior**, integrating:

- **Large Language Models (LLMs)**
- **Natural Language Processing (NLP)**
- **Information Retrieval (IR)**
- **Security Features**
- **Agent Communication Protocols (e.g., MCP, A2A, API-based, etc.)**

This project must also **embed Responsible AI practices** throughout its lifecycle. You will select a real-world application area (shared in Week 3) and provide not just a working system but also a clear plan for how it can be **commercialized**, including its **pricing model**.

Group Formation

- Each group must consist of **3–4 students**.
- Submit group details via [Insert Link / LMS].
- **Deadline for group registration: End of Week 1**

Timeline

Week	Activity
Week 1	Group registration
Week 2	Domain selection, Report template and domain list released
Week 3	Assignment officially begins
Week 6	Mid Evaluation
Week 10	Final Submissions (Video, Report, GitHub Repo)
Week 11	Viva

System Requirements

Your system must:

1. **Solve a problem** in a selected domain (shared in Week 2).
2. **Include at least two interacting intelligent agents.**
3. Use:
    - One or more **LLMs**
    - **NLP techniques** (Ex- NER, Summarization)
    - **Information Retrieval** module
    - **Security features** (Ex- authentication, input sanitization, encryption)
    - Defined **agent communication protocols** (Ex- MCP, HTTP, sockets)
4. Be developed **ethically and responsibly**:
    - Ensure fairness, explainability, transparency, and user data protection.
    - Reflect Responsible AI considerations in the report and viva.
5. Include a **commercialization strategy**:
    - Pricing model
    - Target users/market

- Deployment ideas

Deliverables

1. Mid Evaluation Presentation – Week 6 (20 Marks)

- System architecture
- Agent roles and communication flow
- Progress demo
- Responsible AI compliance check
- Commercialization concept pitch (brief)

2. Final Submissions – Week 10

Deliverable	**Description**
Gen AI-Based Video (25 Marks)	3–5 minute explanation using tools like Synthesia, Pika, HeyGen, etc.
Final Report (30 Marks)	Technical report using provided template (shared in Week 2). Must include: system design, methodology, Responsible AI implementation, **commercialization plan** (with pricing), evaluation results
GitHub Repository (5 Marks)	Well-organized codebase with a detailed README (setup, usage, contributors, etc.)

3. Viva – Week 11 (20 Marks)

- Technical depth
- Individual contribution
- Understanding of communication protocols
- Explanation of Responsible AI practices
- Commercialization and pricing discussion

Evaluation Breakdown

Component	Marks
Mid Evaluation (Week 6)	20
Gen AI Video Submission	25
Report + GitHub Repo	35
Viva	20
Total	**100**

Additional Guidelines

- Plagiarism or unauthorized code reuse will lead to disqualification.
- Each group member must contribute, viva will check for individual involvement.
- **Responsible AI** will be monitored at **all stages** (design, implementation, and presentation).
- The **report template** (with section instructions) will be provided in Week 2.
- Use of any open-source or commercial LLMs / APIs / frameworks is allowed.
- Creative and clear Gen AI video presentations will be highly rewarded.

For any doubts or assistance, contact during lab hours or via – **samadhi.r@sliit.lk**