This module's Github repository:
https://github.com/LisaDuschek/Essex_MScAI_IntelligentAgents_eportfolio-

Module Reflection – Lisa Duschek

The Intelligent Agents module consisted of two project parts:

1. **Assignment 1:** A group project report, where the team came together as a group of software consultants, required to develop an agent that can perform tasks for an organisation with domain-specific requirements.
   Our group chose to focus on the following specifications:

   Digital Forensics: Finding specific filetypes on a file system, archiving them and sending the results somewhere for analysis.

2. **Assignment 2:** An individual 20-minute project presentation of the development of the agent designed for assignment 1. It included a demonstration of the developed agent, including testing and documentation, as well as all code files and dependencies.

Throughout this module, I developed and deepened my understanding of intelligent agents and their applications, particularly how they can autonomously perform tasks and adapt to their environments. Before starting the module, my knowledge of intelligent agents was very rudimental, only consisting of some basic concepts and ideas. My existing knowledge of machine learning concepts provided a solid learning foundation, enabling me to grasp and understand the topic rather quickly. However, the in-depth learning about intelligent agents presented new challenges, especially concerning their decision-making processes and learning paradigms.

The module's lectures and additional reading materials were instrumental in exploring various intelligent agent concepts such as First Order Logic, agent architecture and agent communication languages (ACLs). I found the case studies and examples provided and covered particularly interesting, as they demonstrated real-world applications of intelligent agents in fields such as healthcare, finance, and autonomous vehicles.

During Assignment 1, our group developed a multi-agent digital forensics system designed to identify file types, verify MIME types, summarize text, and report type

counts. My primary focus was on quality assurance and the structural integrity of the system. I ensured that each agent operated smoothly within the overall architecture, verifying that data was accurately passed between agents. This involved creating clear specifications for each agent's tasks and conducting testing to identify and rectify any issues.

Through this process, I learned the importance of modular design and how a well-structured system can enhance functionality and facilitate debugging. I also gained insight into quality assurance practices, understanding how systematic testing and validation contribute to a reliable final product. Overall, this experience deepened my understanding of digital forensics and the critical role that quality assurance plays in software or artifact development.

For Assignment 2, I developed the AI-based Summarizer Agent, based on the design and planning we did as a group for assignment 1. I experienced both challenges and learning opportunities during this part. One of the main challenges was ensuring that the agent could handle various file formats effectively. Integrating libraries like PyPDF2, python-docx, and openpyxl required some research and meticulous attention to detail, especially during the validation process to ensure only compatible files were processed.

Another significant challenge was implementing error handling throughout the workflow. I learned the importance of providing users with clear feedback on issues such as invalid file types or exceeding size limits, something which often falls by the wayside during the development process. This experience highlighted once again the need for well-planned and executed user interfaces that improve usability and minimize frustration.

Focusing on quality assurance and structure, I developed a systematic approach to coding, which facilitated easier debugging and maintenance. Additionally, my experience with the Groq API and previous NLP projects I have worked on in the past, helped me implement the AI-based summarization of document contents, which I was particularly proud of in this project.

Another valuable take-away from this module was the iterative nature of developing intelligent agents. As we progressed through both assignments, it became clear that experimentation and refinement are crucial in achieving optimal performance. I appreciated how our team adopted an agile approach, allowing us to adapt our strategies based on feedback and results. This experience reinforced my belief in the importance of continuous learning and iteration in any project.

Throughout the module, I also greatly improved my existing technical skills by exploring various programming frameworks and libraries related to intelligent agents, which I was not yet familiar with. This self-directed learning not only enhanced my technical expertise but also enabled me to contribute more effectively to our group discussions and project work.

In hindsight, the Intelligent Agents module not only expanded my technical knowledge but also fostered personal growth in areas such as teamwork, communication, and ethical considerations. I learned that effective collaboration is essential for success, particularly in a remote setting where clear communication, planning and coordination is key to ensuring everyone is aligned on project goals.

Looking ahead, I feel well equipped and ready to apply the knowledge and skills gained from this module in my current role. I am currently working as an AI lead and machine learning engineer for a humanitarian NGO, developing models for groundwater level mapping in Africa. Over recent months, the need to develop multiple models and combining their results has arisen, so having the knowledge and skills to implement different agents backed up with machine learning techniques will improve the project outcomes greatly.

In conclusion, the Intelligent Agents module has been a valuable experience for me, which has deepened my understanding of agent-based systems, their applications, advantages and disadvantages and of course ethical and legal implications to be considered. I am excited to continue exploring this field and applying my learning in my current professional role, contributing to the development of intelligent systems that are not only effective but also ethical and responsible. By engaging with the complexities of intelligent agents, I have developed a more comprehensive perspective that will guide my future work in AI and related fields.