SIT788

Engineering AI Solutions

Learning Summary Report

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SELF-ASSESSMENT DETAILS

The following checklists provide an overview of my self-assessment for this unit.

	Pass (D)	Credit (C)	Distinction (B)	High Distinction (A)
Self-Assessment			✓	

SELF-ASSESSMENT STATEMENT

DECLARATION

I declare that this portfolio is my individual work. I have not copied from any other student's work or from any other source except where due acknowledgment is made explicitly in the text, nor has any part of this submission been written for me by another person.

Signature: **Prateek Singh**

PORTFOLIO OVERVIEW

This portfolio contains all the work that demonstrates that I have achieved all the Unit Learning Outcomes for, SIT788 – Engineering AI Solutions, to minimum Pass level and aiming for a Distinction Level.

I started this unit while having an AI Engineer background with experience in computer vision solutions. This unit taught theories that are directly applicable to the software I write. I learned about the issues which affect the deployment of a Machine Learning model in the real world. The skills learned during this unit have not only enabled me to know more about state-of-the-art solutions related to Engineering AI solutions but also taught me scalable and quick AI software development. The Distinction tasks allowed me to freely explore the cutting-edge work being done in this domain. The learnings have allowed me to employ the skills in the coursework as well as in my workplace.

The starting tasks (*3.1P – 3.3C)* were fundamental in understanding the building blocks required in developing an AI pipeline. The tasks also introduced us to standard ML techniques like classification and the metrics used to evaluate such algorithms like precision, recall and accuracy etc.

In *Task 4.1 ML deployment on Azure,* I was introduced to the Azure framework, this taught me the benefits of cloud-based ML development. Azure SDK also showed how such frameworks give abstraction capabilities by providing APIs for complex and abstract machine learning tasks.

Task 5.1 Computer Vision and *Task 5.2 Computer vision and custom vision* allowed me to use Azure SDK to develop Azure application to process image and video data to generate meaningful insights in form of classification and object detection. Developing applications such as face detection taught me how frameworks like Azure can streamline development efforts and reduce technical debt by using standard API calls using Azure SDK.

Task 6.1 *LUIS and QnA Maker* and Task 7.1 *Natural language processing (LUIS)* focused on developing NLP solutions using Azure framework. *Task 8.1 create a bot using Azure* showed how Azure language services can be used with an interactive bot and published as a live bot across various channels like Facebook, Slack, Webchat etc.

Task 7.2 *Azure AI fundamental* allowed us to test Azure SDK knowledge by taking AI – 900 certification. This also strengthened my skillset for machine learning engineer role.

In *Task 9.1P Advanced intelligent system* allowed me to explore the working of an Intelligent System in form of Alexa. I explored the system design and various module involved in designing an intelligent personal assistant (IPA).

During these tasks, I have displayed hands-on capability as well as capability to learn frameworks by understanding their documentation (Alexa/AWS and Azure SDK). I have demonstrated the hands-on capacity by developing Azure applications for computer vision and natural language understanding. I believe this makes me a suitable candidate to achieve Distinction.

REFLECTIONS

Advent of AI has changed software development approaches, novel AI based approaches are forming the new benchmark for software development life cycle. The expectation from this unit was awareness about these new age AI development strategies, and real-world applications of frameworks like Azure SDK. This unit has provided me a comprehensive understanding of skills required to develop end to end AI solutions. The *Ontrack* tasks were fundamental in providing opportunity to work on real world use cases.

After completing the *OnTrack* tasks I have confidence in my hands-on ability to quickly prototype and develop a baseline solution for computer vision, speech and NLP tasks using Azure SDK like frameworks. I am also confident in my ability to comprehend state of the art frameworks like but not limited to Azure SDK.

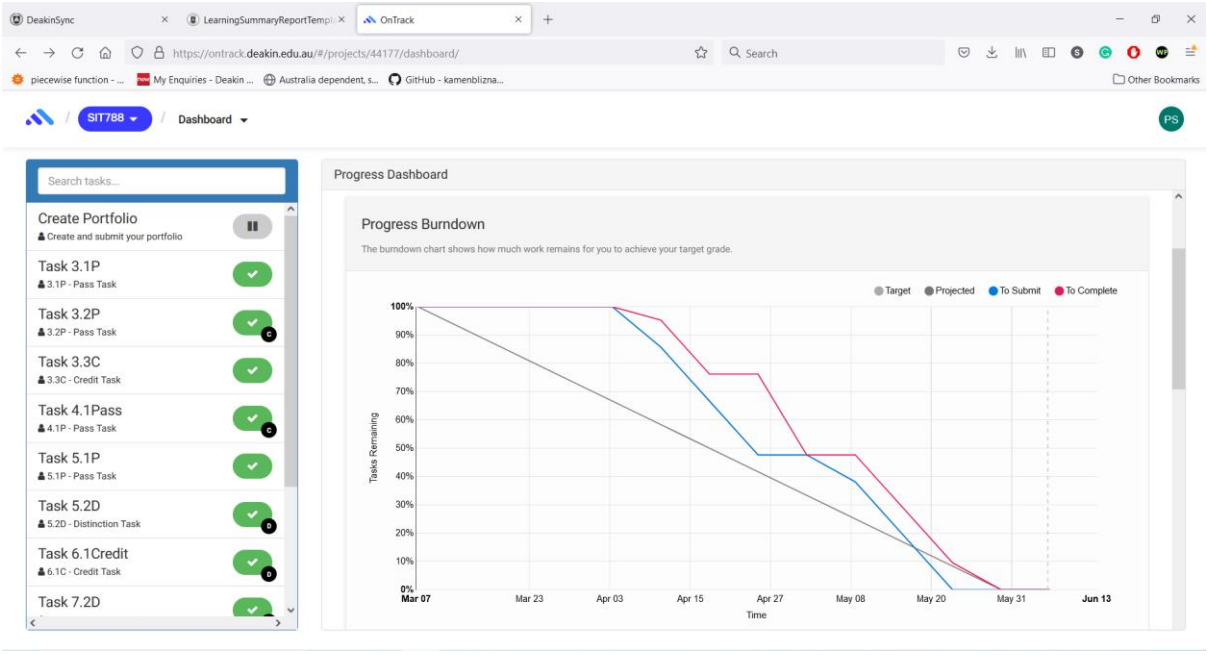
The most challenging task for me was remembering Azure specific terminologies for AI -102 certification which refer to out of the box solutions for Form Recognizer, Custom Vision, and Language Vision etc. use case. This required additional efforts and understanding the use cases that can be best solved by using specific Azure solutions. Learning these taught me patience and the relevance of reading up documentation of such frameworks. While I could not complete the HD task for AI – 102 certification, I feel confident on completing the certification in future.

Task 9.1: Advanced intelligent system was the most interesting topic of this unit for me. I learned how different AI services coalesce to form an intelligent system. This taught me how various models are deployed in real-world setting.

Along with the technical skill, effective time management was one of the key skills that I picked up during these 11 weeks. This taught me the importance of estimating the time required to come up with solutions for a problem statement. This is also a skill which I would like to improve in the future.

The material provided on the Cloud Deakin portal and the weekly lecture helped a lot in perfecting Azure SDK development skills and AI solutioning in general. These were complemented by the weekly workshop sessions which helped me to put these skills into practice. A major highlight was the *Ontrack* tasks, especially Distinction tasks, they allowed me to develop end to end solutions using Azure SDK which will be immensely helpful in designing solutions for business use cases.

The *OnTrack* screenshot denotes that I have taken up all distinction level tasks with best of my ability. It also shows that I could have finished some of the tasks sooner which would have allowed me time to revisit them.



I have pursued this unit with satisfactory effort but if I did this unit again then I would aim for High Distinction grade. While I have completed all the distinction level tasks, I could not complete the last two HD tasks which included AI-102 certification. This is something that I would focus on in the future, adding AI-102 certification to the skills acquired in this unit will further strengthen my credibility as an AI engineer and Microsoft Azure practitioner. I would also aim to improve my time management skills.

As an AI professional, this unit has made me aware of the need for scalable and quick AI development by using frameworks like Azure SDK. This will enable me to lead efforts in my workplace into writing scalable solutions and migrating existing solutions towards state-of-the-art frameworks (Azure, AWS etc.) and accelerating development time.