

ASSIGNMENT BRIEF

HTU Course No:
10204250

HTU Course Name:
Artificial Intelligence & Intelligent Systems

BTEC UNIT No:
Unit 15 [K/618/5660]
Unit Level :4

BTEC UNIT Name:
Fundamentals of Artificial
Intelligence (AI) & Intelligent Systems

Assignment Brief Number: 1
Version: 1



Assignment Brief

Student Name/ID Number/Section	
HTU Course Number and Title	10204250 – Artificial Intelligence & Intelligent Systems
BTEC Unit Number and Title	Unit 15 [K/618/5660 – Fundamentals of Artificial Intelligence (AI) & Intelligent Systems]
Academic Year	Spring 2022-2023
Assignment Author	Dr. Rami Ibrahim
Course Tutor	Dr. Rami Ibrahim Dr. Murad Yaghi
Assignment Title	The foundations of AI and the development of an AI system
Assignment Ref No	1
Issue Date	15/05/2023
Formative Assessment dates	15/05/2023 to 1/06/2023
Submission Date	20/6/2023
IV Name & Date	Orwah Mohammed Aladaileh 14/5/2023

Submission Format

The assignment consists of 2 parts and the submission of the assignment should be through the university's eLearning system within the deadline specified above using the following link: <https://elearning.htu.edu.jo>. You must also submit the student declaration form filled out and signed properly. The declaration form should be named as: "FirstName LastName AI Declaration form Spring 22-23.docx". **DO NOT compress (zip) any files.**

Submission for part 1 of the assignment is expected to be as follows:

1. The submission of a report in the form of a **Docx** soft copy submitted to the university's eLearning system.
2. Written in a formal business style using single spacing and font size 12, of times roman.
3. You are required to make effective use of headings, bullet points, and subsections as appropriate, and your work must be supported with real-world examples and research papers/books.
4. Your research should be referenced using the Harvard referencing system.

Submission for part 2 of the assignment is expected to be as follows:

1. The submission of a report in the form of a **Docx** soft copy submitted to the university's eLearning system.

2. Written in a formal business style using single spacing and font size 12, of times roman.
3. You are required to make effective use of headings, bullet points, and subsections as appropriate, and your work must be supported with real-world examples and research papers/books.
4. Your research should be referenced using the Harvard referencing system.
5. A demonstration of the analysis you have performed in the form of a Python notebook with all intermediate results displayed within the notebook.

Submission checklist:

- No compressed files or folders (no.zip or .tar extensions)
- Report 1 file named as “FirstName LastName AI part 1.docx”.
- Report 2 file named as “FirstName LastName AI part 2.docx”.
- Report 2 notebook named as “FirstName LastName AI part 2 notebook.ipynb”
- Declaration form named as “FirstName LastName AI Declaration form Spring 22-23.docx”

Unit Learning Outcomes

LO1: Discuss the theoretical foundation of Artificial Intelligence and its impact on users and organisations.

LO2: Analyse the approaches, techniques, and tools to deploy Intelligent Systems in an organisation.

LO3: Modify an AI-based system to improve how it exhibits intelligence in response to a real-world problem.

LO4: Evaluate the technical and ethical challenges and opportunities of Intelligent Systems.

Assignment Brief and Guidance

The Jordanian Ministry of Digital Economy and Entrepreneurship announced the Jordanian strategy for artificial intelligence (AI) for the years 2023-2027. One of the main goals is to provide a clear roadmap on how to employ and use AI in Jordan and empower students and graduates with the necessary AI skills.

Please read the following two links for more information:

<https://www.jordannews.jo/Section-109/News/Cabinet-approves-Jordan-s-AI-strategy-for-2023-2027-23644>

<https://www.dataguidance.com/news/jordan-ministry-announces-draft-ai-strategy-and>

You have been hired as a new intern in a software company that plans to provide IT solutions to the public and private sectors. Your objective is to utilize your experience in AI and machine learning to build AI applications in various domains. After building the solution you need to

present your work and results to clients, gather their feedback, and improve your solution accordingly.

Part 1

1. Describe the following fundamental aspects of AI:
 - The difference between AI, deep learning, and machine learning
 - What is AI?
 - Important features of big data?
2. Describe the difference between weak AI and strong AI?
3. Describe some of the areas of applications of AI systems used to solve real-world problems?
4. Analyse the advantages and disadvantages of using AI in one of the areas of applications you mentioned in the previous question?
5. Investigate and analyse the security and ethical issues in your selected AI system?
6. Discuss and analyse the technical challenges in your selected AI system?
7. Review implications of ethical and technical issues to both users and the organization?

Make sure to include all references in your report.

Name your report as “FirstName LastName AI part 1.docx”.

Part 2

As part of the Jordanian strategy for artificial intelligence (AI), 66 AI projects were suggested, covering all sections of the Jordanian economy. The goal is to encourage the adaptation of AI in Jordan within the most vital sectors. As a new intern, you were tasked with implementing two AI algorithms, Artificial Neural Networks (ANN), and one of the following machine learning algorithms: logistic regression, decision trees, and random forest.

Tasks:

1. Select one project from the Jordanian strategy for artificial intelligence (AI).
2. Find online sources/papers/companies which might have implemented the project already or have collected relevant datasets for the project. This could be from inside or outside of Jordan. Some suggested sources:
 - Local Jordanian dataset/model.
 - Kaggle <https://www.kaggle.com/>
 - UCI Machine Learning Repository <https://archive.ics.uci.edu/ml/index.php>
 - Papers with Code <https://paperswithcode.com/>
3. If the project has been fully implemented in a previous paper, you should add a new contribution/novelty to your AI application.
4. After implementing your AI project, prepare a report as shown below.

Your report should include the following sections:

1. Introduction about the problem and assess its impact to users/organizations. This should include a clear written problem statement.
2. The deployment of your project (i.e., tools and techniques) should include:
 - A materials section that should have:
 - a. Source of data
 - b. How the data was collected
 - c. Description of the data
 - A methods section that should have:
 - a. Why you selected a specific model/technique for your implementation and how it compares to other models (i.e., advantages/challenges of each model).
 - b. Demonstrate the AI frameworks, investigate the model's technical implementation, and plot the pipeline used to implement your model.
 - c. Explain how your model can work together with other models/tools/approaches in the organization.
 - d. What measures of performance you used to evaluate your model and what is the rationale for using such metrics?
 - e. Evaluate how based on the performance measures you were able to enhance the model.
 - A results and discussion section where you discuss:
 - a. Assess the results you have found and assess the feasibility of implementing the system in Jordan.
 - b. Explore if the model you built can be enhanced and how it can be enhanced? Are there other tools/frameworks that could be used?
 - c. Evaluate your role in building and improving such an AI system?

Make sure to include all references in your report.

Name your report as "FirstName LastName AI part 2.docx".

Make sure to submit your Python notebook as well named as:

"FirstName LastName AI part 2 notebook.ipynb"

Learning Outcomes and Assessment Criteria			
Learning Outcome	Pass	Merit	Distinction
LO1 Discuss the theoretical foundation of Artificial Intelligence and its impact on users and organisations	P1 Describe the fundamental aspects of Artificial Intelligence.	M1 Analyse the advantages and disadvantages of using Artificial Intelligence to an area of application	D1 Critique the potential impact of deploying several types, approaches and tools of AI and Intelligent Systems on both users and organisations
	P2 Describe the types and areas of application to solve current real-world problems.		
LO2 Analyse the approaches, techniques and tools to deploy Intelligent Systems in an organisation	P3 Investigate options around the approaches, techniques and tools for the deployment of modern Intelligent Systems	M2 Demonstrate how different approaches and tools work together for the deployment of Intelligent System.	D1 Critique the potential impact of deploying several types, approaches and tools of AI and Intelligent Systems on both users and organisations
	P4 Compare the advantages and challenges of several tools and techniques for the development of Intelligent Systems.		

LO3 Modify an AI-based system to improve how it exhibits intelligence in response to a real-world problem.			D2 Evaluate your own role to improve the performance of an AI-based system
	<p>P5 Investigate the technical implementation of an AI-based system.</p> <p>P6 Explore the technical options to enhance the performance on an AI-based system.</p> <p>P7 Modify an AI-based system to enhance performance</p>	M3 Demonstrate a technical modification, to an existing deployment of an AI based system, using benchmarking to enhance its performance.	
LO4 Evaluate the technical and ethical challenges and opportunities of Intelligent Systems.			D3 Analyse the technical and ethical challenges while appreciating the opportunities of Intelligent Systems.
	<p>P8 Investigate the security and ethical issues with Intelligent Systems.</p> <p>P9 Discuss the technical challenges involved in managing and maintaining Intelligent Systems.</p>	M4 Review the legal implications and security risks to both users and organisations of using Intelligent Systems.	

STUDENT ASSESSMENT SUBMISSION AND DECLARATION

When submitting evidence for assessment, each student must sign a declaration confirming that the work is their own.

Student name:		Assessor name:
Issue date: 15/5/2023	Submission date: 20/6/2023	Submitted on:
Programme: Computing		
HTU Course Name: Artificial Intelligence & Intelligent Systems		
BTEC Course name: Fundamentals of Artificial Intelligence (AI) & Intelligent Systems		
HTU Course Code: 10204250		BTEC Unit: 15
Assignment number and title: No 1. The foundations of AI and the development of an AI system		

Plagiarism

Plagiarism is a particular form of cheating. Plagiarism must be avoided at all costs and students who break the rules, however innocently, may be penalized. It is your responsibility to ensure that you understand correct referencing practices. As a university level student, you are expected to use appropriate references throughout and keep carefully detailed notes of all your sources of materials for material you have used in your work, including any material downloaded from the Internet. Please consult the relevant unit lecturer or your course tutor if you need any further advice.

Student declaration

I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice.

Student signature:

Date: