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| ASSIGNEMNT BRIEF | | | |
| HTU Course No:  10204250  BTEC UNIT No: ﻿ Unit 15 [K/618/5660] | | | HTU Course Name:  Artificial Intelligence & Intelligent Systems  BTEC UNIT Name:  ﻿Fundamentals of Artificial  Intelligence (AI) & Intelligent Systems | | |
| **Assignment Brief Number: 1**  **Version: 1** | | | |
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# **Assignment Brief**

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| 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 | Fall 2022-2023 |
| Assignment Author | Dr. Rami Al-Ouran |
| Course Tutor | Dr. Rami Al-Ouran |
| Assignment Title | The foundations of AI and the development of an AI system |
| Assignment Ref No | 1 |
| Issue Date | **05/12/2022** |
| Formative Assessment dates | **12/12/2022 to 01/02/2023** |
| Submission Date | **04/02/2023** |
| IV Name & Date | Dr. Mariam Biltawi |

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| **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 submit the student declaration form filled out and signed properly as well. The declaration form should be named as:  “FirstName LastName AI Declaration form Fall 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 **both** .docx and .pdf formats 2. 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. 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 **both** .docx and .pdf formats 2. 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. Your research should be referenced using the Harvard referencing system. 3. A demonstration of the analysis you have performed in the form of a Python Jupyter notebook with all intermediate and 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” and in pdf format. * Report 2 file named as “FirstName LastName AI part 2.docx” and in pdf format * Report 2 notebook named as “FirstName LastName AI part 2 notebook.ipynb” * Declaration form named as “FirstName LastName AI Declaration form Fall 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** | | | | | | |
| This year 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>  **Part 1**  ﻿You have been hired as a new intern at a local Jordanian bank which plans to establish a new AI department as part of the Jordanian strategy for artificial intelligence. You have been tasked with preparing a two-page report to help other members of the bank understand the fundamentals of AI, and highlight to your manger the importance, and any possible risks of establishing such a department.  Your report should include the following sections:   1. Explain and describe what is AI? and a provide brief history of AI? 2. Explain how can AI be used in the bank? how can it improve the bank tasks? 3. What are some disadvantages which could result from establishing an AI department at the bank? 4. How would you; as an AI engineer, convince your manager to spend more money to establish the AI department? How can you convince the manager on the importance/impact of such a department? Provide justification. 5. Investigate any security, legal, ethical issues associated with the AI department and its roles, and assess its implications to both users and the bank business? 6. Discuss and evaluate the technical challenges you will face as an AI engineer when establishing the AI department?   Make sure to include all references in your report.  Name your report as “FirstName LastName AI part 1.docx” and in pdf format as well.  **Part 2**  As part of the Jordanian strategy for artificial intelligence (AI), 66 AI projects were suggested, covering all sections within the Jordanian economy. The goal is to encourage the adaptation of AI in Jordan within the most vital sectors. As a new AI engineer; and as part of the bank’s committeemen to the Jordanian economy and society, you were tasked with selecting one of the AI cards and implementing it using your technical AI skills and knowledge.  Tasks:   1. Select one project/card from the Jordanian strategy for artificial intelligence (AI). 2. Find online sources/papers/companies which might have implemented the card already or has collected relevant datasets to the project/card. This could be from inside or outside of Jordan. 3. Implement the project/card using the knowledge and skills you have acquired as an AI engineer. If the project has been fully implemented in a previous paper, you should add a new contribution using 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 asses its importance/impact to Jordan. This should include a clear written problem statement. 2. A materials section which should include:    1. Source of data    2. How the data was collected    3. Description of the data 3. A methods section which should include:    1. Why you selected a specific model for your implementation and how it compares to other models.    2. Demonstrate the AI frameworks and tools used to implement the model and plot the pipeline used to implement your model.    3. Explain how the model was implemented and asses what your role was to improve the performance of the system or model.    4. What measures of performance you used to evaluate your model and the rationale of using such metrics? Evaluate how based on the performance measures you were able to enhance the model. 4. A results and discussion section Where you discuss:    1. Asses the results you have found and the asses the feasibility of implementing the system in Jordan.    2. Explore if the model you built can be enhanced and how it can be enhanced? Are there other tools/frameworks that could be used?    3. Evaluate what was 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” and in pdf format as well.  Make sure to submit your Jupyter 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 | | | | ﻿**D1** ﻿Critique the potential  impact of deploying several  types, approaches and tools  of AI and Intelligent Systems  on both users and  organisations | |
| ﻿ | | **P1** ﻿Describe the fundamental  aspects of Artificial  Intelligence.  **P2** ﻿Describe the types and  areas of application to solve  current real-world problems. | **M1** ﻿Analyse the advantages  and disadvantages of using  Artificial Intelligence to an  area of application |
| **LO2** ﻿ ﻿Analyse the approaches, techniques and tools to deploy Intelligent Systems in an organisation | | | | ﻿  **D1** ﻿Critique the potential  impact of deploying several  types, approaches and tools  of AI and Intelligent Systems  on both users and  organisations | |
| **﻿** | | **P3** ﻿Investigate options around  the approaches, techniques  and tools for the deployment  of modern Intelligent  Systems  ﻿**P4** Compare the advantages  and challenges of several  tools and techniques for the  development of Intelligent  Systems. | ﻿**M2** ﻿Demonstrate how  different approaches and  tools work together for the  deployment of Intelligent  System. |
| **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 |
|  | | ﻿**P5** Investigate the technical  implementation of an AI-based system.  **P6** Explore the technical  options to enhance the  performance on an AI-based  system.  **P7** Modify an AI-based  system to enhance  performance | ﻿**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. |
|  | ﻿**P8** Investigate the security  and ethical issues with  Intelligent Systems.  **P9** Discuss the technical  challenges involved in  managing and maintaining  Intelligent Systems. | ﻿**M4** Review the legal  implications and security  risks to both users and  organisations of using  Intelligent Systems. |