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# Programme

# Bachelor of Software Engineering – 360 credits

# Course

# Artificial Intelligence (AI)

# CS204A

# (Level 06, 15 Credits)

# Summative

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| Project: Weight 75% | | |
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| Rationale This assignment requires the implementation of artificial intelligence concepts that will test the machine learning understanding.  It comprises of the following:   * Selecting a scenario and analysing the data * Building a model and analyzing the model's fairness * Analysing the performance for the final model using Jupyter  GuidelinesChoose a scenario requiring reducing the decision-making time, i.e. house price assessment, cancer cell detection, etc.Write about the manual evaluation process and how this process can be done without any machine learning algorithm.How this process can be improved using machine learning-based solutions.Analyse your data (CSV file) and generate model pipelines to predict the results.Write about how data transformation, algorithms and parameters are used to create these model pipelines.Track and measure the outcomes from the AI models to ensure it is fair and created with accuracy.In your dataset, populate the last column with 1 or 0 (if it’s already given then use it )to show the classification results for supervised learning. Now, look at the pattern of the classification results, i.e. false cancer cell detection, false prediction of house price etc. The performance can be analysed using spitting the data and building the model. Write about the observation of the model accuracy and confusion matrix. You can use Jupyter Notebooks for the code.Using the above result's observation, answer the following. Also, add examples/references where required.Write about the choice of dataset with meta-data information and how it contribute to the scenario that you have chosen. |  | Why splitting of data into two subsets (train and test) are important and how you have achieved it with the classifier that is used?Write about handling missing values, outlier management, feature engineering and hyper parameters optimization. If any is required in your data how you would have managed?Write explanation why is precision and recall scores? How you can make this score better for your data.Write about feature importance and highlight some of the attributes from your data that has the high impact on the outcome.Write about visualization, how confusion matrix play an important role in machine learning task. **Report**  The components of this submission must contain the followings:   * Scenario overview with experimental evaluation detail. * Result section with screenshots/plots * Discussion about the results and how these can improve overall. * Conclusion section with the overview of the current limitation and future work. * The report is written formally and technically with formal writing, correct spelling, grammar, terminology, headings, formatting, citation etc.  Copyright Authenticity Notice Academic dishonesty and plagiarism are considered serious offences at Yoobee Colleges. By completing and submitting this assessment you are authenticating that the work is original and does not violate copyright law. Due Date/Timeframe Assessment is **due on** **25th Nov 2022**. Submission Instructions Submissions are accepted only via LMS containing the following,  **TASKS**   * Full technical report in ***\*.pdf*** format containing your whole development process and research findings. * A video (3 to 5 minutes) and screenshots that demonstrate of your project. * Please submit code and all other required working to show as evidence of work.  Learning outcomes On successful completion of this course, students are able to:   1. Demonstrate an understanding of the algorithmic foundations of AI and it’s interrelation with   probability.   1. Demonstrate and understanding of the core concepts of knowledge, reasoning and planning in artificial intelligence and how automated agents learn. 2. Apply AI techniques to deal with common practical problems |

# Performance Criteria

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| Criteria &  Weighting | | **D Range** D-      D      D+ | **C Range** C-      C      C+ | **B Range** B-      B      B+ | **A Range** A-      A      A+ |
| **Selection and pre-processing of the dataset**  **(LO1, LO2)** | 10% | The choice of the dataset is not right and if any pre-processing is required not done. | Selection of dataset is done but few samples are used. Pre-processing are not done completely if required. | Selection of dataset is appropriate and related to the scenario. Pre-processing is done but having some missing information | Good choice of scenario and dataset is shown with  reasonable number of samples. |
| **Implementation**  **(LO1, LO2, LO3)** | 30% | The implementation does not include any tasks outlined in the guideline. | The tasks consists of some key milestones outlined in the guideline.  Many bugs are present and tasks are poorly done. | The tasks includes most milestones outlined in the guideline. However, a few bugs are present. | The tasks includes all milestone outlined in the guideline. There are no bugs. |
| **Screenshots**  **(LO2, LO3)** | 10% | Screenshots for the required tasks are not shown as evidence. | Some of the screenshots for the required tasks are shown as evidence. Screenshots are not clear enough. | Most of the screenshots are shown. A few important screenshots are missing. | All the screenshots (results, execution using the required software, plots etc) are shown clearly that can show the tasks completion in detail. |
| **Coding Practices**  **(LO1, LO2, LO3)** | 15% | Code is not clear or completed to perform the required tasks. Comments are not given.  Little to no screenshots of program code and corresponding output are present. | A code with a minimal understanding can show the execution of some of the tasks. Minimal comments are shown.  Some of the screenshots of the code execution is given. | A code with a good understanding of program flow can show the completion of most of the tasks. In addition, a good number of comments have been showcased.  The description of key functionality is documented to a reasonable level via the use of output screenshots and screenshots of corresponding code. | A code with an excellent understanding of program flow is given that can show the completion of all the tasks.  A good number of comments have been showcased.  The description of key functionality is documented to an outstanding level via output screenshots and screenshots of corresponding code. |
| **Individual Production Report**  **LO1)** | 25 | Not submitted or contains very few required sections.. | Only a few of the required sections in the report are present. The explanation is lacking detail and clarity. | Most of the required sections in the report are present Explanation is lacking detail and clarity. | All required sections in the report are present and explained with full detail and clarity. Good discussion on tasks overview, results and conclusion section is given. |
| **Presentation**  **LO1, LO3)** | 10% | All the required elements in the presentation/video demonstration have been included/described with ambiguity or are not included/described.  The student/team has showcased poor video recording, presentation and communication techniques. | All the required elements in the presentation/video demonstration have been included/described with missing details.  The student/team has minimally contributed to the video. However, the student/team has showcased satisfactory video recording, presentation and communication techniques. | All the required elements in the presentation/video demonstration have been included/described with less clarity.  Student/team has sufficiently contributed to video the presentation. In addition, the students/teams have showcased a level of video recording, presentation and communication techniques. | All the required elements in the presentation/video demonstration have been included/described with clarity.  The student/team’s contribution to the video presentation is excellent and evident. In addition, the student/team has showcased an outstanding level of video recording, presentation and communication techniques. |
| **Total** | 100% |  |  |  |  |
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