**Course Work Project Description and Rubric**

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| --- | --- | --- | --- | --- | --- |
| **Semester** | **202420** | | **Division** | | CIS |
| **Assessment title in Syllabus** | **Project** | | **Program** | | **IT and IS** |
| **1** |  | |  | |  |
| **Course Code** | **CIS 2423** | | | | |
| **Course Title** | **Programming for Data Analytics** | | | | |
| **CLOs** | **All CLOs** | | **Accreditation Body** | | **CAA & CIPS** |
| **Course Instructor** |  | | **CRN** | |  |
| **Assessment Weight** | **40%** | | **Submission Date** | | **Week 14** |
| **For Group Work submissions an additional individual assessment will be conducted.**  **Grades for the students in one group will vary based on the individual performance in the additional assessment.** | | | | | |
|  | | | | | |
| **Student Declaration**:  **Academic Integrity Statement**  In accordance with the HCT Academic Integrity Policy  • Students are required to refrain from all forms of academic integrity breaches as defined and explained by HCT.  • A student found guilty of having committed acts of academic integrity breach(es) will be subject to the relevant sanctions as outlined by HCT.  إفادة النزاهة الأكاديمية  **وفقًا لسياسة كليات التقنية العليا للنزاهة الأكاديمية**  **• على الطلبة الإلتزام بلوائح وقواعد النزاهة الأكاديمية، كما هو مبيّن وموضح في السياسات والإجراءات الخاصة بكليات التقنية العليا.**  **• في حالة ارتكاب الطالب أي شكل من أشكال الإخلال بالنزاهة الأكاديمية، سيتعرض الى العقوبات الموضحة في السياسات ذات الصلة.**  This assignment is entirely my own work except where I have duly acknowledged other sources in the text and listed those sources at the end of the assignment.  I have not previously submitted this work to the HCT, or any other entity. I understand that I may be orally examined on my submission.  **Student (s) Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | | | | | |
|  | | | | | |
| **Student Name(s):** | **Salha Abdulla Alremeithi** | **Rawdha Naser Alkindi** | | **Raweya Salem Almahri** | |
| **Student HCT ID(s):** | **H00492001** | **H00492180** | | **H00467842** | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Group (50%)** | | | | | **Individual (50%)** |  |  |
| **C**LO | **1** | **2** | **3** | **4** | **Report Formatting** | **Oral Defense** | **Total** | **%** |
| **Marks Allocated** | 10 | 10 | 42 | 26 | 12 | **50** | **100** | **4**0 |
| **Marks Obtained** |  |  |  |  |  |  |  |  |

# Introduction purpose of data analysis

In this study, a dataset of health activities is studied. We used python to clean the data, explore it, find patterns, predict calories burned, and group users based on their activities. The main purpose is to predict calories burned based on steps, distance, heart rate and active minutes. We also want to find patterns to help people improve their fitness.

# Type of programming used for data analysis

Programming type: python

Python is used in data science due to its readability and simplicity. Libraries that provide extensive tools for data cleansing, visualization, statistical analysis, and predictive modelling include pandas, numpy, matplotlib, and seaborn.

# Type and purpose of the machine learning algorithm

In this project we used supervised and unsupervised learning:

* Regression is a supervised type used to predict continuous values, like how many calories and burned based on steps, distance, heart rate.
* Classification is a supervised type used to categorize users into groups, such as high calorie burners or low-calorie burners.
* Clustering is an unsupervised type used to group similar users without predefined lables, such as active user or moderately active user.

# Identify and Justify the independent and dependent variables

Independent variables are variables that are controlled or used as inputs in the study. In this project, the independent variables are steps, Hours\_of\_Sleep, heart\_rate. These variables are predictors that influence the number of Calories\_Intake.

Dependent variables are observed or measured in the study. In this project Calories it measures energy output based on independent variables.

# Python Scripts for Analysis

### Exploratory Data Analysis and Descriptive Statistics

We performed descriptive analysis on the chosen dataset to gain a clear understanding of the data before applying any machine learning algorithms. It helped us summarize key features such as average steps, distance, heart rate, and calories burned. This analysis allowed us to detect missing values, identify outliers, and observe patterns or trends in user activity. Descriptive statistics and visualizations like histograms and box plots provided insights into the distribution and relationships between variables, which is essential for making informed decisions during model development.

### a Python function for descriptive statistics.

A screen shot of a computer code

Description automatically generated

The descriptive statistics (health, column) function computes and returns a dictionary of key statistical measures for a specified column in a dataset, including the mean, median, standard deviation, variance, minimum, maximum, and percentiles (25%, 50%, and 75%). This versatile tool provides a comprehensive summary of a column's distribution and variability, supporting a quick and efficient data analysis.

### Program for Random Sampling and Apply the Function

A screenshot of a computer code

Description automatically generated



This Python script takes a random sample of 150 rows from the dataset and calculates basic statistics for the **Calories\_Intake** column. The average (mean) is **2272.83**, and the median is **2198**, indicating the values are slightly skewed toward higher numbers. The standard deviation is **658.8**, showing moderate variability, and the variance is **434,023.98**. The values range from **1728.75 to 2748.75**. These statistics provide a good overview of the distribution and spread of **Calories\_Intake** in the sample.

### Program for Systematic Sampling and Apply the Function

A screenshot of a computer code

Description automatically generatedA close-up of a website

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This Python script uses systematic sampling to analyze the **Calories\_Intake** column. It selects every 5th row from the dataset using the iloc function and calculates descriptive statistics for the sample. The average (mean) value is missing in the text, but the **median is 2337.68**. The **standard deviation is 677.09**, and the **variance is 458,447.48**, showing that the values don’t vary much. The **minimum value is 1240** and the **maximum is 3496**. The 25th, 50th, and 75th percentiles are **1713**, **2391**, and **2934.5**, respectively. These results suggest that the **Calories\_Intake** values in the systematic sample are fairly consistent.

### Create a detailed descriptive statistics report about the dependent variable of the chosen dataset.

A screenshot of a computer

Description automatically generated

This Python script generates a detailed report on the **Calories\_Intake** column in the **health** dataset using a custom function. The average (mean) is **2327.12**, the **median** is **2328.5**, and the **mode** is **0**, suggesting the data is slightly skewed toward higher values. The **standard deviation** is **657.87**, and the **variance** is **432,763.91**, indicating moderate variability. Values range from **1201 to 3498**, giving a total range of **2297**. The **interquartile range (IQR)** is **1134.25**, reflecting the spread of the middle 50% of the data. The **25th, 50th, and 75th percentiles** are **1745.75**, **2328.5**, and **2880**, showing that more values fall in the upper range. The data shows a slight **right skew (0.052)** and a **kurtosis of -1.172**, indicating a moderately flat distribution. Overall, the report provides a clear summary of the central tendency, variability, and shape of the **Calories\_Intake** distribution.

### Visualize the Dependent Variable

##### Scatter plot:

A screenshot of a computer

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The scatter plot generated by the Python script visually shows the distribution of **Calories\_Intake** values in the dataset. Each light blue dot represents a data point, with the **x-axis** showing the row index and the **y-axis** displaying the corresponding **Calories\_Intake** value. The plot reveals how the data points are spread across the datasetA diagram of calories in a graph

Description automatically generated

##### Box Plot:

A white background with red text

Description automatically generated

A diagram of a box plot

Description automatically generatedThe box plot shows the spread of calorie intake among people. Most people eat between **1600 and 2200 calories**, which is shown by the box in the middle. The line inside the box shows the **average intake is around 1900 calories**. There are some people who eat much more or much less than average, shown as **dots outside the box (outliers)**. This helps us see the common range and any unusual values in the data.

##### Histogram:

A close up of words

Description automatically generated

A graph of calories intake

Description automatically generatedThe histogram shows how many people fall into different calorie intake ranges. Most people eat between **1400 and 2200 calories** per day. The highest number of people eat around **1800 to 2000 calories**. Very few people eat more than **2500 calories**. This means most people in the data have a normal or average calorie intake.

##### Heat Map:

A screenshot of a computer code

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The heatmap shows how the numerical values in the dataset are related to each other. **Dark red means a strong positive relationship**, and **dark blue means a strong negative relationship**. For example, **weight and BMI** have a strong positive correlation, meaning when weight increases, BMI also increases. On the other hand, **steps and calories intake** may show a weak or noA graph with red and blue squares

Description automatically generated strong connection. This heatmap helps us quickly understand which features affect each other the most.

### Perform Hypothesis Tests for Correlations

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Description automatically generated

The Pearson correlation test result shows whether there is a significant relationship between Calories Intake and Daily Steps. If the p-value is less than 0.05, it indicates a statistically significant correlation, meaning as Daily Steps increase or decrease, Calories Intake tends to follow a pattern. However, if the p-value is greater than 0.05, it suggests there is no significant correlation between the two variables, and changes in Daily Steps do not reliably affect Calories Intake.

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Description automatically generated

The Spearman correlation test checks if there is a relationship between "Calories Intake" and "Daily Steps." If the pvalue is greater than or equal to 0.05, it means there is no significant correlation. If the pvalue is less than 0.05, it means there is a significant correlation. The rvalue shows how strong the relationship is, with values closer to 1 or -1 showing a stronger relationship.

### Perform One-Sample T-TestA screen shot of a computer Description automatically generated

Since the one-sample t-test result shows a t-statistic of 0.0 and a p-value of 1.0, this means there is no difference at all between the sample mean and the population mean of "Calories Intake." The high p-value (1.0) clearly indicates that the sample is perfectly representative of the population, and there is no evidence to suggest otherwise.

# Machine Learning Modeling

### Simple Regression

A screenshot of a computer program

Description automatically generated

In the simple linear regression analysis, "Daily Steps" is used to predict "Calories Intake." After training the model, the output shows the **coefficient** (regressor.coef\_) and **intercept** (regressor.intercept\_), which define the linear relationship between the two variables. The coefficient indicates how much "Calories Intake" is expected to change for each additional step taken, while the intercept represents the estimated "Calories Intake" when daily steps are zero. These values help form the regression equation used for predictions.

A screen shot of a graph

Description automatically generated

In this result, the model is used to predict the calorie intake for the data point with the value 95, and it returns a prediction of approximately 2358.87 calories. This means that, based on the model's understanding of the data, a person or scenario represented by the input 95 is estimated to require around 2359 calories. This predicted value is slightly higher than the one shown in the earlier example, which suggests that a different model or input format might have been used here.

The graph shows a comparison between the actual calorie values (y\_test, shown in the solid blue line) and the predicted values from the model (y\_pred, shown in the dashed orange line). The actual values vary a lot and fluctuate widely, while the predicted values remain almost flat, close to a constant line around 2300 calories. This means the model is not accurately capturing the changes in the data — it's predicting nearly the same value for all inputs, which suggests that the model might be too simple or not well-fitted to the test data.

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This code is using PolynomialFeatures to transform the original data X into a new set of features that includes not only the original values but also their squares and combinations. Specifically, it's creating polynomial features up to degree 2 (which means it adds squared terms and interactions between features). This helps in fitting a curved (non-linear) model instead of just a straight line, allowing for more flexibility in capturing complex patterns in the data.

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This result shows that the model predicted the calorie intake for the 96th data point (since indexing starts at 0) to be about 2318.65 calories. This prediction was made using a polynomial regression model, which fits a curved line to the data for more accurate results. In simple words, based on the input features from that data point, the model thinks the person likely consumed around 2319 calories.

This code builds a polynomial regression model to predict calorie intake based on the input data. After fitting the model with the transformed (polynomial) data, it prints the coefficients and intercept of the curve it learned. The model found a curve with coefficients around -0.009 and 0.00000051, and an intercept (starting value) of about 2349.22. These numbers describe the shape of the curve used to make predictions.

A computer screen shot of a computer code

Description automatically generated

A screenshot of a computer code

Description automatically generated

This code creates a graph showing how well the polynomial regression model fits the data. The pink dots represent the actual calorie intake for each number of daily steps, while the blue curve shows the model’s predicted calorie intake. The curve is smooth and follows the pattern of the pink dots, which means the model is doing a good job of matching the real data. In simple words, this graph shows that the model can accurately guess how many calories someone burns based on how many steps they take.

A graph with a line in the center

Description automatically generated

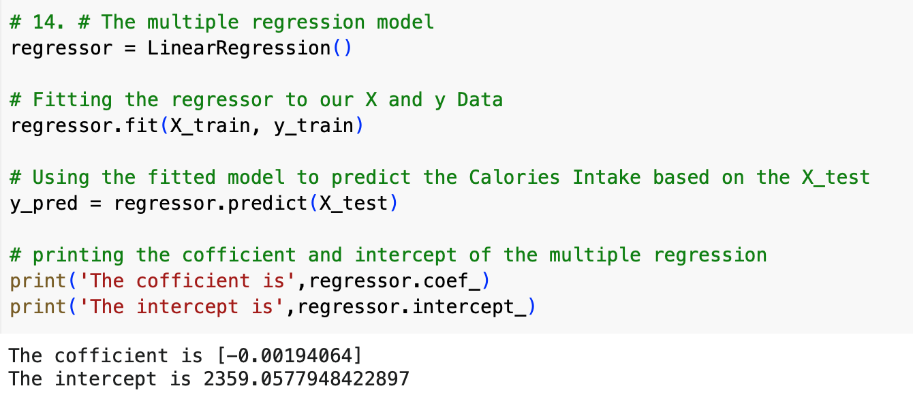
This result shows a prediction made by the model based on three input values: 5134, 102, and 8.6 (likely representing steps, activity duration, and maybe distance or speed). The model predicts that the calorie intake (or calories burned) would be about 2348.3 calories. In simple words, using these three inputs, the model estimates that the person burned around 2348 calories.

This graph shows how the model tries to predict calorie intake based on daily steps. The pink dots are the real data points, showing actual calories burned by people with different step counts. The blue line is the model’s prediction, and it stays mostly flat, meaning it doesn't change much even as the number of steps increases.

A screenshot of a computer

Description automatically generated

### Multiple Linear Regression



This code builds a multiple linear regression model to predict calorie intake. After training the model with the given data, it found a coefficient of -0.00194 and an intercept of 2359.06. This means that for each unit increase in the input variable (like steps or time), the predicted calorie intake goes down slightly. The intercept tells us that if the input is zero, the model predicts about 2359 calories.

A screen shot of a graph

Description automatically generated

This graph shows how well the multiple linear regression model predicted the calorie intake. The blue line represents the actual calorie values (y\_test), while the orange dashed line shows the model’s predicted values (y\_pred). We can see that the orange line doesn’t closely follow the blue line—it jumps around a lot and doesn't match the real values very well. In simple words, the model's predictions are not very accurate, and it struggles to capture the real pattern in the data.

### Evaluate Each Model (Confusion Matrix & Accuracy)

### Logistic Regression

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Description automatically generatedThe logistic regression model was used to classify calorie intake levels based on health-related features. After splitting and scaling the data, the model was trained and evaluated using a confusion matrix, accuracy, recall, and precision scores. The confusion matrix shows how accurately the model predicted each class, while the accuracy score indicates the overall prediction success rate. Recall measures how well the model identified each actual class, and precision reflects how reliable the predictions were for each class. These results help assess the model’s performance in classifying calorie intake categories.

KNN

A screenshot of a computer program

Description automatically generatedThe K-Nearest Neighbors (KNN) model was trained to classify calorie intake levels based on multiple numerical health features. After scaling the data and fitting the model with 5 neighbors, the predictions were evaluated using a confusion matrix, accuracy, recall, and precision. The confusion matrix shows how well the model predicted each category. The accuracy score reflects the overall correct predictions, while recall measures how well the model captured actual categories, and precision shows the correctness of those predictions. Together, these metrics provide insight into how accurately KNN classified the calorie intake categories.

Naive Bayes

A screenshot of a computer

Description automatically generatedThe Naïve Bayes classifier was used to predict calorie intake levels based on daily steps, with the target variable divided into three categories. After training the model and making predictions, the confusion matrix shows how well the model classified each category, while the accuracy score reflects the overall percentage of correct predictions. Recall indicates how well the model identified each actual class, and precision measures how many of the predicted class labels were correct. These metrics together give a clear view of the model's effectiveness in classifying calorie intake based on activity levels.

Decision Tree

The decision tree classifier was trained to predict the target variable, and its performance was evaluated using a confusion matrix, accuracy, recall, and precision scores. The confusion matrix shows how many predictions were correct and incorrect for each class. The accuracy score indicates the overall correctness of the model, while recall measures how well the model identifies actual positive cases, and precision reflects how accurate the positive predictions are. Together, these metrics help assess how well the decision tree performs in classifying the data.A screenshot of a computer program

Description automatically generated

### Perform Cluster Analysis (K-means and Hierarchical)

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A screen shot of a computer

Description automatically generated

The K-Means clustering analysis was performed on the scaled dataset using the Elbow Method, which suggested 3 optimal clusters. The model grouped the data based on the "Daily Steps" field, forming three distinct clusters shown in a scatter plot with different colors (pink, yellow, turquoise). Each cluster represents individuals with similar activity levels, and the purple dots indicate the cluster centers, showing the average for each group. This analysis helps identify patterns in physical activity, such as low, moderate, and high daily step counts across the dataset.

### Strategy after Clustering

After viewing the cluster diagram, the strategy should focus on targeting specific groups based on their activity levels. For example, individuals in the low activity cluster can be encouraged to increase daily steps, while those in the high activity cluster can be monitored for over-exertion. Personalized health recommendations, such as exercise routines or dietary plans, can be tailored to each cluster's characteristics. Further segmentation by exploring additional variables like calories intake or BMI can refine the clusters, and optimizing the clustering technique can help identify better patterns. Finally, tracking changes over time can help monitor progress and adjust interventions as needed.

# GitHub Version Control Tasks

### Create a new repo for project in Git Hub

### files created for CLO1, CLO2 and CLO3 to the Git Hub repo

### Configure Git with GitHub

### Clone Git hub repo to Git

### Pull any file from Git Hub repo to Git

### Modify the pulled file and push the modified file to Git Hub

# Rubric

*Please note that the Project rubric should reflect the project description and be CAP-compliant. Please feel free to customize the descriptors as per the project requirements and course level.*

## Group Project Rubric [Task-specific RUBRIC]

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Absent (F)** | **Insufficient (1-59%)**  **(F)** | **Emerging (60-69%)**  **(D/D+/C-)** | **Satisfactory (70-76%)**  **(C/C+)** | **Competent (77-86%)**  **(B-/B/B+)** | **Mastering (87-100%)**  **(A-/A)** |
| * **Group Grading-Critical Thinking: Analysis and Evaluation [45%]** | **Deliverable 1: understanding of data analytics [CLO1]**  **(5%)** |  | None of the following:   * Purpose of data analysis not mentioned. * Selection of programming language is not referenced. * Type of machine learning algorithm to be analyzed is not defined * Variables for data analysis are not mentioned   . | Some but not all the following:   * Purpose of data analysis mentioned but not clear. * Selection of programming language is referenced. * Required machine learning algorithm to be analyzed is ill-defined [Too many models mentioned] * Variables for data analysis are mentioned without justification | Most but not all the following:   * Purpose of data analysis is clearly mentioned. * Selection of programming language is referenced. * Required machine learning algorithm to be analyzed is defined, but without justification. * Variables for data analysis are mentioned with justification but not clear | All of the following:   * Purpose of data analysis is clearly mentioned. * Sound rationale for choosing the programming language * Required machine learning algorithm to be analyzed is well-defined with appropriate justification. * Variables for data analysis are mentioned with clear justification | All of the following:   * Purpose of data analysis is clearly mentioned with appropriate explanation * Thoroughness of programming language chosen is evident. * Student synthesizes information about machine learning algorithm from multiple disciplines and sources and presents them with clarity. * Variables for data analysis are precisely defined with appropriate justification * Employ outstanding knowledge about the data analysis from different sources |
|  | **Deliverable 2: Apply data analysis and visualization techniques [CLO2]**  **(25%)** |  | * No evidence of justification to perform descriptive statistics * Function is not created for descriptive statistics * Sampling techniques are not designed * Exploratory analysis are not performed * Hypothesis tastings are not achieved * Data preprocessing is not devised * Regression models are not functioned * Optimization for regression model is not operated * Best fit model is not enacted | Some but not all the following:   * Evidence of justification to perform descriptive statistics exist but not clear * Function is created for descriptive statistics having major syntactical errors. * Sampling techniques are designed but not appropriate * Exploratory analysis are performed but ill-designed * Hypothesis tastings are achieved with flaw * Evidence for data preprocessing exist but with inappropriate techniques * Regression models are functioned with huge faults * Optimization for regression model is operated with inaccuracies   Best fit model is enacted without justification. | Most but not all the following:   * Evidence of justification to perform descriptive statistics exist with clear elucidation * Function is created for descriptive statistics without flaws. * Sampling techniques are designed with appropriate rationalization * Exploratory analysis are performed with appropriate legends * Hypothesis tastings are achieved appropriate assumption * Evidence for data preprocessing exist but with applicable techniques * Regression models are functioned without mistake * Optimization for regression model is operated with appropriate metrics * Best fit model is enacted appropriate interpretation | All of the following:   * Appropriate description and exploratory analysis provided. * Sound rationale for chosen hypothesis testing * High accuracy obtained for regression model * Rigor is evident. | All of the following:   * Appropriate description and exploratory analysis provided along with exemplary analysis * Sound rationale for chosen hypothesis testing and infer statically in commendable way * Other regression model are handled obtained from different sources * Rigor is evident. |
|  | **Deliverable 4: Data Versioning**  **[CLO 4]**  **(5%)** |  | * No evidence of creating a new repository and uploading project files to Git Hub * Git is not configured with Git Hub * No evidence for cloning Git hub repo to Git * Push and Pull are not performed | Some but not all the following:   * Repository model is created but files are not uploaded to repo * Git is not configured with Git Hub * Evidence of cloning exists with appropriate options * Push and Pull are performed which are insignificant | Most but not all the following:   * Repo are created and project files are uploaded to repo * Git configuration are performed with accordance of Git Hub * Evidence of cloning exists with proper options * Push and Pull are significant but not consistent | All of the following:   * Repo are created and project files are uploaded * Advanced configuration is performed on Git * Many functions related to cloning is performed apart from basic operations * Push and pull with different scenario are mentioned | All of the following:   * Scenario is created and explained about significance of repo creation * Advanced configuration is performed on Git * Different cloning techniques should be elucidated. * Push and pull with different scenario are mentioned * Branching should be exhibited |
|  | **Deliverable 3: The data model created using classification and clustering algorithm of machine learning [CLO2, CLO3]**  **(15%)** |  | * Incomplete classification models are presented. * No optimization and recommendation are performed for classification model. * No evidence of any cluster analysis * No strategies are produced from cluster model. | Some but not all the following:   * Comprehensive classification models are presented but with significant errors * Thorough optimization and recommendation are performed for classification model but with poor validation * Evidence of cluster analysis exists with poor performance * Strategies are derived from cluster model which are insignificant | Most but not all the following:   * Comprehensive flawless classification models are presented * Thorough optimization and recommendation are performed with appropriate validation for classification model * Evidence of cluster analysis exists with better performance * Strategies are derived from cluster model which are significant but not consistent | All of the following:   * Implemented all classification models * Major validation works demonstrated on optimization and recommendation of classification model * Appropriate cluster analysis was performed and good strategies are postulated and well-documented. | All of the following:   * All classification models are accurate * Perform more classification models from different sources * All cluster models are accurate * Perform more cluster models from different sources * Appropriate interpretation and recommendations are provided |
| **Group Grading:**  **Report Quality  [5%]** |  |  | * Incomplete report with missing most of the deliverable components. * Too many typographical errors. | Some but not all of the following:   * Complete report with required deliverables. * Clear table of contents showing all required sections. * Free from formatting and typographical errors. | Most but not all of the following:   * Complete report with all required format and deliverables. * Some minor formatting and/or typographical errors. * Table of contents presented with some missing information. | All of the following:   * Complete report with required format and deliverables. * Clear table of contents showing all required sections. * Some minor formatting and/or typographical errors. | All of the following:   * Complete report with required format and deliverables. * Clear table of contents showing all required sections. * Free from formatting and typographical errors. |

## Individual Oral Presentation

## Student (1) Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Student HCT ID:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| --- | --- | --- | --- | --- | --- | --- |
|  | **Absent** | **1-59.49%** | **59.5% - 69.49%** | **69.5% - 76.49%** | **76.5% à86.49%** | **86.5% à100%** |
| **Collaboration (10%)** |  | * Does not partake in the task or is so frequently distracted that he/she produces. * Having made no contribution to the group's objective. | * Participates in the task but does not collaborate with others or contribute to the group process. * Participates in discussions. * Expresses own opinion and viewpoints. * Remains dedicated to the subject. * Performs independently specific tasks | * Cooperates with the group process, but does not coordinate contributions with those of others. * Does not interrupt while listening. * Actively seeks the input of others. * Accepts duties that have been assigned. * Complies with the group consensus. * Utilizes the ideas of others | * Coordinates processes and products with those of teammates, but does not resolve significant conflicts. * Actively pays attention to what is being said. * Offers and accepts constructive feedback. * Adapts ideas and/or processes to the needs of colleagues. * Seeks consensus. * Effectively resolves trivial disputes | * Student coordinates collaborative processes and outputs. * Effectively resolves both significant and minor conflicts. * Expresses disagreements in an open and diplomatic manner. * Supports group decisions even if they are not unanimously supported. * Compromised and negotiated to attain an agreement |
| **Oral Communication (Presentation)**  **(12 Marks)** **[All CLOs]** |  | * Communicates with a limited sense of audience and purpose * No eye contact, no body language, and no decorum * Communicates with limited clarity * Uses language with limited accuracy and effectiveness. * Tension and anxiety are palpable; * Has difficulty recovering from errors. | Not all of the foregoing are true:   * Communicates with a clear sense of audience and purpose * Eye contact, body language, and decorum) * Communicates information and ideas with considerable clarity * Uses language with considerable accuracy and efficacy * Makes insignificant errors, but rapidly recovers * Displays minimal or no tension. | Most of the following, but not all:   * Communicates with a clear sense of audience and purpose * Eye contact, body language, and decorum) * Communicates information and ideas with substantial clarity * Uses language with substantial accuracy and effectiveness. * Makes simple mistakes but recovers swiftly; * Displays minimal or no tension. | Each of the subsequent:   * Communicates with a clear sense of audience and purpose * Eye contact, body language, and decorum * Communicates information and ideas with considerable clarity * Uses language with considerable accuracy and efficacy. * Makes insignificant errors, but recovers rapidly * Demonstrates minimal or no tension. | Each of the subsequent:   * Communicates with a strong awareness of audience and purpose * Maintains audience's attention by using direct eye contact and rarely glancing at notes. * Communicates information and ideas with a high degree of precision and precision * Student appears at ease and confident, with no errors. |
| **Follow-up questions and discussion (28 Marks)** **[All CLOs]** |  | Unable to answer questions from the examining board | Able to answer some but not all questions from the examining board | Able to answer most but not all questions from the examining board | Capable of answering all of the examining board's queries. | Capable of responding to all inquiries and demonstrating a thorough understanding of the material. |