

CHAPTER 01 POSSIBLE QUESTIONS

Project Context

- **What is time management?**
 - form of decision-making that people use to organize, secure, and adapt their time in shifting conditions
 - Strategies such as **scheduling and planning** is effective in enhancing organization and task completion [2]
 - Students who use scheduling for their academic task have shown higher academic performance [3][4]
 - **Why is time management important?**
 - According to Ghafar [4], a crucial use of time management is to ensure that we are neither overworked nor under burdened with responsibilities; thus, effective time management is essential.
 - **Why do we need to prioritize tasks?**
 - According to Ghafar [4], it is crucial to prioritize your responsibilities if you want to be able to manage your time well.
 - **What is scheduling?**
 - a **form of planning** where specific times are set for an activity or a task, which, as a result, shows an increase in completion for both work and leisure activities [5]
 - **What is the problem?**
 - There is an issue related to scheduling which is planning fallacy where people tend to underestimate the duration to complete a task and have been documented in various studies [6]
 - **Why use machine learning?**
 - Estimating task completion is crucial for many applications, such as scheduling, and **machine learning models can be trained to predict task duration** [7]
 - Without being programmed, machine learning allows systems to learn and enhance over time [8].
 - Utilizing machine learning enhances time series prediction by applying various algorithms, including linear regression, to improve accuracy [9].
 - **Why Linear regression?**
 - It is simple, fast, and has great performance, and when used in time series, it is important to consider evaluating the model performance with proper metrics [11]
 - It shows a linear relationship between dependent and independent variables in which dependent variables can be predicted based on the independent variables.
 - **What are the dependent and independent variables?**
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 - **What metrics were used when evaluating the model performance?**
 - **MSE (Mean Squared Error) and r^2** - to determine how well the model fits the data [27][28]
 - **Why MSE and r^2 ?**
 - **Mean square error (MSE)** is most widely used in the regression model, where the independent variable that is the target values are continuous. It is measured as the mean squared differences between actual output and predicted output.
 - **MSE and RMSE** are used to measure the quality of a predictor or a regression model
 - **r-squared** shows how well the data fit the regression model
- Reference:

"Mean Square Error - an overview | ScienceDirect Topics," [www.sciencedirect.com. https://www.sciencedirect.com/topics/engineering/mean-square-error](https://www.sciencedirect.com/topics/engineering/mean-square-error)

Pandey, Rajiv . "Artificial Intelligence and Machine Learning for EDGE Computing." ScienceDirect, 2022, www.sciencedirect.com/book/9780128240540/artificial-intelligence-and-machine-learning-for-edge-computing.

Taylor, Sebastian. "R-Squared." Corporate Finance Institute, 2024, corporatefinanceinstitute.com/resources/data-science/r-squared/.

- **Pano malalaman if pasado yung MSE and r^2 ?**

- There is no correct value for MSE. Simply put, the lower the value the better. Similarly, there is also no correct answer as to what R^2 should be.
- Since R^2 value is adopted in various research discipline, there is no standard guideline to determine the level of predictive acceptance.
- Standards for a good R-squared reading can be much higher, such as 0.9 or above

Reference:

Rowe, Walker. "Mean Squared Error, R^2 , and Variance in Regression Analysis." BMC Blogs, 2018, www.bmc.com/blogs/mean-squared-error-r2-and-variance-in-regression-analysis/.

Qomarul Huda, M. "Acceptable R-Squared in the Information System Research" ResearchGate, www.researchgate.net/post/What-is-the-acceptable-R-squared-in-the-information-system-research-Can-you-provide-some-references.

J. Fernando, "R-Squared: Definition, Calculation, and interpretation," Investopedia, Nov. 13, 2024. <https://www.investopedia.com/terms/r/r-squared.asp#:~:text=What%20qualifies%20as%20a%20%E2%80%9Cgood,such%20as%200.9%20or%20above>.

- **Kasama na ba yung MSE and r^2 don sa machine learning?**

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- **Bakit kailangan iconvert ang categorical data into numerical? (Explanation sa python code)**

- Categorical features represent attributes or characteristics that don't have a natural numerical representation, such as colors, types of cars, or product categories. **Machine learning algorithms typically require numerical inputs, so converting these categorical features is crucial for making the data usable in models.**

- **What is the accuracy of the model after training?**

- Presented on **page 49** is the accuracy of the model based on the datasets gathered from the application. It shows an **88.89% accuracy**

- **Is scheduling recommended to be used by students?**

- College students often suffer from time scarcity, which results in a drain on cognitive capacity and executive function, thus lowering their ability to plan, reason, and multitask. Busy students often engage in tunneling, ignoring everything but the most pressing concern. To support these students, **timelines are recommended for task completion and divide larger assignments into smaller tasks.**

Reference:

M. Holmes, "Time Scarcity and Student Performance: Instructional Strategies for Busy adult online students," *Canadian Journal of Learning and Technology*, vol. 48, no. 3, pp. 1–14, Apr. 2023, doi: 10.21432/cjlt28357.

- **What happens with time scarcity and poor time management?**

- drain on the cognitive and executive function of students which leads to poor planning, reasoning, and multitasking [13]
- **Students who suffer from poor time management may be withdrawn from willingly working on their tasks and will likely experience procrastination**, thus lowering academic performance [14].
- **Solution for Procrastination?**
 - Another time management strategy **known for effectively reducing procrastination** is the **Pomodoro technique** [15].
 - Such a technique has been **proven by several studies to help students reduce academic procrastination and increase retention, concept mastery, and academic performance** [17].
- **Why are breaks important?**
 - taking predetermined, systematic breaks during academic sessions clears boundaries between work and rest and appears beneficial in academic learning in general [18][19].
- **What is the solution?**
 - researchers propose an application that offers a solution for the planning fallacy that comes with scheduling by providing a task duration prediction feature based on the historical data of the user's Pomodoro session with the use of machine learning, specifically a linear regression algorithm.

Purpose and Description

- **What is the purpose?**
 - The primary purpose of this project is to **design, develop, and evaluate an academic task scheduling system that predicts academic task durations and optimizes the student's schedules by utilizing task prioritization and Pomodoro**.

Scope

- optimized academic task scheduling system with machine learning-based task duration prediction from the data of historical Pomodoro Sessions utilizing a linear regression algorithm.
- device that will be utilized for this app is an Android and will be compatible with Android 9.0 "Pie" up to Android 14
- specific tasks are assignments, reading, researching, reviewing, and writing [21][22]
- features like Pomodoro timer functionality and optimized scheduling using a Linear Regression Algorithm to personalize the predicted academic task durations after training the model numerous times based on datasets and historical Pomodoro session data.
- enables users to create and prioritize tasks by manually selecting a priority level on the task creation tab.
- bento-style dashboard was designed to include task creation, an analytics with estimated pomodoro session per task, calendar overview, and a academic task list with predicted duration or the schedule provided by the model
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- Black-box Testing for testing and ISO 25010 for evaluation
- The 1st to 3rd-year BSIT students from Tarlac State University College of Computer Studies were the chosen respondents for this project, these chosen respondents were selected due to their higher academic tasks and units taken per semester. This selection also aligns with a study conducted by Manya Tahir (2022) that also focused on 1st, 2nd, and 3rd year students [24].
- the study excluded 4th-year students as they have fewer units and usually prioritize training
- Likert Scale was utilized to assess the degree to which individuals agreed or disagreed with the given statements on the survey they answered

Limitations

- **Task availability:** The study may have limitations in accessing or performing a task with future dates, as it is only limited to running the current date set. Accessing the task with the current date allows the user to focus on a fixed number of tasks rather than being overwhelmed by an extensive list of tasks.
- **Online access:** The study may have limitations in running offline for the app utilized firebase as its database. Firebase was used to allow multiple users to log in to the app and lessen the size of data.

CHAPTER 4

● Why Agile Scrum?

- Agile Scrum methodology was examined as the best option for its flexibility in project management. By having a timeframe for each sprint, the development of the project will be fast as tasks are completed within the allocated time. The researchers were assigned to complete the product and are responsible for developing the Sprint Backlogs. By minimizing the project's issues and mistakes, this method will significantly increase the system's effectiveness.

Others

● What are the parameters used in machine learning?

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- Bakit walang label yung sa task list kung anong type ng academic task

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● Bakit butal yung scheduling?

- A study by Leblanc stated that on-the-hour scheduling may increase procrastination by creating more 'slack' or downtime that will be used to work or waste time on non-goal-related activities.

Reference:

[2] C. Leblanc, "Task scheduling and productivity," Carleton University Institutional Repository, 2022. <https://repository.library.carleton.ca/concern/etds/d217qq36z>

● If ganon, bakit on the hour nakalagay sainyo?

- participants showed a preference to schedule tasks on-the-hour
- Based on the tests, the result showed that there were no difference when starting a task on-the-hour and off-the-hour

Reference:

[2] C. Leblanc, "Task scheduling and productivity," Carleton University Institutional Repository, 2022. <https://repository.library.carleton.ca/concern/etds/d217qq36z>

● Scheduling can increase productivity

- Past literature has consistently linked scheduling to increased productivity (Malkoc et al., 2019; Ariely & Wertenbroch, 2002; Baker et al., 2019; 43 Macan et al., 1990; Parke et al., 2018)