



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

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**CODE & SUBJECT :  
SECJ1023-Programming  
Technique II**

**NAME OF LECTURER :**

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**PROJECT 1 :**

**SLEEP ANALYZER SYSTEM**

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## **Synopsis and general idea Synopsis**

The sleep Cycle Analyzer is a simple and basic c++ web-based system, that is planned to guide users to analyze and improve their sleeping habits. The system uses the collected data from the users such as total time in bed, sleep duration and other physiological markers during sleep. Once sufficient information is collected, the system analyzes to identify designs and patterns within the user's sleep cycles, as well as the length and quality of each sleep stage. For example, light, deep and Rapid Eye Movement (REM) sleep. Based on this analysis, the system will suggest altering sleep plans, optimizing the sleep environment or practicing relaxation methods. Overall, the Sleep Cycle Analyzer may be a straightforward, but effective system for anyone looking for a better understanding of healthy sleeping habits and to improve their sleep habits.

## **System objectives and/or purpose**

In today's fast-paced and demanding world, the need for quality sleep has become increasingly recognized as essential for overall health and well-being. However, many struggle with understanding their sleep patterns and how to get sufficient restorative rest each night. Besides, there is a common misconception prevalent today, the belief that the quantity of sleep alone determines how energetic and refreshed a person feels. Many people assume that more hours of sleep equate to better rest and increased energy levels. However, this oversimplified view overlooks the importance of sleep quality in determining how rejuvenated and alert one feels upon waking up. This is where a sleep cycle analyzer plays a crucial role in our daily lives to improve our overall efficiency. There are three main objectives of developing a sleep cycle analyzer. Firstly, we can identify our sleeping stages including falling asleep, light sleep, deep sleep, and REM sleep. Each stage plays a vital role in the overall quality of sleep and its restorative effects on our body and mind. By analyzing these stages, a sleep cycle analyzer can reveal how much time you spend in each stage throughout the night. Secondly, our sleep needs also might be identified indirectly. This is because we may ascertain more precisely when, why and what conditions your sleep improves through the analysis of a sleep cycle analyzer. For instance, the users will be able to compare and recognize whether adjusting the temperature or position of sleeping enhances the quality of their sleep, which will help them get a better night's rest. Finally, detecting sleep anomalies. Some potential sleep disorders such as insomnia or sleep apnea can be identified earlier through functions such as movement tracking and physiological measurements to estimate our sleep stages and overall sleep quality.

## **How to use the system**

Users would visit the sleep cycle analyzer website and sign in using email, google account, microsoft account or Apple ID.

## **Reporting**

For the reporting aspect of the Sleep Cycle Analyzer system, several types of reports or outputs can be generated to provide users with insights into their sleep patterns and suggestions for improvement. Here are the reports/outputs:

1. **Sleep Cycle Analysis Report:** The user's sleep cycles are broken down in detail in the Sleep Cycle Analysis Report. This includes information on how long each stage of sleep lasts (light, deep, REM, and falling asleep), as well as any disruptions or anomalies that were noticed during the night. It may include graphs or visual representations to illustrate the patterns observed.
2. **Sleep Quality Assessment:** Based on variables like sleep duration, sleep efficiency, and the existence of any sleep disturbances (e.g., restless sleep, awakenings), this report assesses the user's overall quality of sleep. It might offer suggestions for enhancing the quality of the user's sleep, like modifying their sleeping environment or engaging in relaxation exercises.
3. **Sleep Trends Analysis:** This report tracks changes in the user's sleep patterns over time, allowing them to monitor progress and identify any long-term trends or patterns. It may include comparative data from previous sleep sessions or benchmarks for optimal sleep parameters.
4. **Personalized Sleep Improvement Plan:** This report provides personalized suggestions for enhancing sleep routines and habits based on an analysis of the user's sleep data. It might recommend adjustments to lifestyle choices, sleeping environments, or bedtime customs that could improve the quantity and quality of sleep.
5. **Sleep Disorder Detection:** The system may produce a report advising additional assessment by a healthcare provider in situations where probable sleep disorders (such as insomnia or sleep apnea) are identified. It might contain details about the symptoms that have been noticed, how frequently they occur, and any possible effects on general health.
6. **Customizable Reporting Options:** Depending on their preferences and needs, users may have the option to customize the format and content of their sleep reports. This could include choosing specific metrics to track, setting goals for sleep improvement, or receiving notifications/alerts for significant changes or events detected during sleep.