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PROGRAMMING EMBEDDED SYSTEMS

Assignment one
Intro to FreeRTOS and Scheduling

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1 PROGRAMMING WITH FREERTOS TASKS

1. a) As "xTimeincrement" defines the amount of time that the task will be idle (roughly the period of the task) so the data type of that variable can have limitations on the calculations.

   b) While trying to test the accuracy of the delay until using different xTimeincrement values, the minimum value was one millisecond, even when i try to delay with a value less than 1 millisecond by inceasing the value of the "TickRate" in the FReeRTOSConfig.h file it suffers from anomalies.

   c) The resolution can affect the performance of the system as it can limit the delay between tasks which can affect the performance.

2 RATE-MONOTONIC SCHEDULING

1. As the Rate monotonic scheduling is used with periodic tasks with (T=D), so for the "Planning module" task the RMS can not deal with it, so as a task set it can not be scheduled by the RMS.

2. For the rest four tasks and by calculating the ***Utilization factor*** which was less than the ***Utilization Bound*** so the rest of the task set is schedulable.

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3. The ***WCET*** can be calculated by simulation as follows:
    a) Create a timer.
    b) Start the timer when the task is released.
    c) Save the value of the timer when the tasks finishes execution.