**Milestone 2**

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SWE-350: Embedded Systems 1

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**SWE-350 Design Report Template**

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| **Topic:** | *Topic 4: C Programming Language: Memory Management, Arrays, Structures, And Pointers* |
| **Date:** | *October 15, 2023* |
| **Revision:** | *1.0* |
| **Milestone Summary:** | |  |  |  | | --- | --- | --- | | **User Story / Task** | **Hours Worked** | **Hours Remaining** | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |
| **GIT URL:** | *The GIT URL that I can use to clone your code.* |

**Design Documentation**

**General Technical Approach:**

*A high-level summary of the embedded application being developed and what technologies, as well as tools, are being used.*

The application will have two main uses. The first use will be its ability to be a clock and accurately display the time of four different time zones depending on the orientation of the switches on the board. The second use will be its ability to be used as an alarm. The user will be able to be created and delete alarms and will be guided by the lcd screen on the board. When an alarm goes off, the user will be notified by led on the board, as well as the lcd screen. The user will have the ability to shut down the alarm early with the press of a button or let it shut itself down at thirty seconds. The FPGA on the board will be used for digital logic implementation to do task such as signal processing, data manipulation, and control logic. The DE10 Standard development board can easily handle an application like this and will likely perform flawlessly as long as I can get both the software and hardware communicating effectively.

**System Design:**

**A computer screen shot of a computer

Description automatically generated**

**Application Design:**

**Changing Time Flowchart**

*A diagram of a computer program

Description automatically generated*

**Creating or Deleting an Alarm**

**A diagram of a system

Description automatically generated**

**Alarm Activated**

**A diagram of a computer flowchart

Description automatically generated**

**Risks and Issues:**

Right now, there are a few uncertainties, so it's hard to predict the exact level of risk. The main concern is the possibility of accidentally short-circuiting the board, especially when it's not in its protective casing. To avoid this, it's important to keep the board away from liquids, make sure it's secure to prevent falls, and ensure it's safe from any potential electrical hazards. Another, less likely, issue is the virtual machine used could become corrupted or fail to open. This would lead to delays because a new virtual machine would need to be created, and all the necessary tools reinstalled. To minimize this risk, I'll keep important files backed up. This has happened before, so it's important to take precautions.

**Other Documentation:**

We currently have limited documentation regarding the utilization of the tools on the board, and no additional external resources are available beyond what we've already supplied for this project. As we acquire more information, I will conduct further research and prepare additional supporting documents for the project. However, at this moment, the provided information constitutes the extent of what I can offer.