

Term Project Proposal: Word Clock
EE 102
Section 02
Bilkent University

March 8th, 2024
Doğa Zeynep Tarman
22303157

Objective

The main objective of this project is to build a simple system which displays what time of the day it is using words, unlike the traditional ones in which time is displayed either with the use of hour and minute hands in analogue clocks or numbers in digital clocks.

Introduction and Description

Clocks are among one of the most common daily objects that we use in our daily lives. They display the time in various ways; some show only the hours and minutes, whereas there are some which display seconds or even milliseconds. They display such information in numerous ways as well, such as analogue clocks displaying them with small arrows or digital clocks displaying them with numbers and dots. A word clock is similar in concept; it displays what the time is by using words, so the user can “read” the time.

A word clock is useful not only for aesthetic purposes, but also for people like me who have visual impairments such as myopia and astigmatism. Digital clocks may be difficult to see from time to time due to numbers being too close to each other, and analogue clocks are again demanding visually since there is no light behind the clock and the hands may be too thin or troublesome to distinguish from each other. With a word clock, I plan to overcome these challenges and make it easier for people like me to check what time it is.

Design

In the design of this project, I am planning to use LEDs as a light source for my clock. They will light up whenever the appropriate time for each comes, and shine behind the respective word that they are supposed to show. The words will be written on an enclosing surface as I have indicated in the External Components part. Using my Basys3, I will light up the necessary LEDs and also use it as a counter for my clock. If I have trouble with the counting part, I might use a counter such as 74163.

Phases

There will be two main phases in my project. One of them will be the progress demo, and the other will be the final demo. In these, I plan to show my improvement and advancements in both the design and my VHDL code.

- **Progress Demo:** In the progress demo, I am planning to show that I have decided on which equipment to use and gathered a part of it. I am also planning to show that I have tried writing the VHDL code to the best of my abilities.
- **Final Demo:** In the final demo, I am planning to obtain significant, if not all, necessary equipment. I will have written most of the VHDL code. Aside from minor design and assembly issues or possible bugs in my code, I am planning to be almost done with my project.

External Components

The following is what I plan to use during the design and implementation of my project. It is possible that there will be minor changes in this list.

- Basys 3
- LEDs
- Wires
- Resistors
- Breadboard (or anything else that I can place the LEDs on)
- Power supply
- An enclosing surface (with suitable displaying properties)