

Requirement Analysis

Embedded Software & Design

Team Name:

ID: U1610146

Name: Mirzashamol Karshiev

ID: U1610131

Name: Madiyor Abdukhayimov

ID: U1610137

Name: Mardon Zarifjonov

Group: CSE-16-3/2

Goal: Digital Alarm Clock using Atmega128 Microcontroller

Description:

- Introduction
- Hardware
- Tools
- Tests

Functional Requirements:

- Mode
- Display Method
- Alarm
- Stop Watch

Introduction:

The project will consist of a digital clock that is made using Atmega128. It is going to be achieved using simulation tools and Atmel Studio 7 and programming languages like assembly and C. The main goal of the project is to produce a clock that has 4 available modes that are given as functional requirements. We are going to collaborate using tools like Zoom for video conferences and GitHub for coding practices and Google Docs for any writing tasks. Testing is going to be non automotive and human control based and this is for current version, as we want to maintain it we try to develop the most important test cases.

Hardware:

The hardware dependency is very simple as it is implemented using microcontrollers which are capable of executing instructions without having an operating system installed. The chip that is given as default is Atmega128 and it runs at clock speed of around 14.5 MHz and it has programmable flash memory of 128 kbyte. It supports and can be programmed using C and assembly language. Any hardware that

should be used must have ports which can be programmed as digital inputs and outputs. That concludes the main hardware dependency. Adding to the main hardware dependency we can include Power supply (5v), capacitors (100nF) and switches and resistors and buttons and LCD display is needed.

Tools:

The project was developed using simulation tools and there was no tool which was missing. However, in real life we would need following tools:

- Wires and solder
- Wire Cutters and wire isolators
- drill and screws
- Hot Glue Gun (optional)
- Multimeter

Tests:

Testing is fairly important to develop the project. The way that we want to test our project is using git and developing stage by stage and merging the result to master or main branches only when we see all the features are working in development branches. In this way we can at least make sure that we do not lose our confidence in the product and we can keep improving the product as much as we want in development branches.

Functional Requirements:

1. Mode

The product that we deliver can have three different modes and they are as follows. First one is “Normal Display” mode and the second one is “Alarm” and the last one is “Stopwatch”

2. Display Method

It is the method of displaying the date. And it can be as follows.

Line 1: year date and month day

Line 2: Hour (AM/PM), minute, second display

3. Alarm

Alarm can be in two modes either blinking LED or Any style (Free Style).

4. Stop Watch

Style is free and it must have resolution of 1 over 100 per seconds

Acceptance Criteria:

Video must be uploaded to [Youtube.com](https://www.youtube.com)