Vision:

The goal of this project is to create the software that controls a Dual Alarm AM/FM Clock Radio. The software must support the use of two alarms that can be set to a desired time. The clock radio must also be able to switch between AM and FM and connect to specific radio stations as selected by the user.

Use Case UC1: Setting the Alarm

Primary Actor: Clock Owner

Goal in Context: Setting the alarm so it goes off at desired time

Scope: Dual Alarm Clock Radio Software

Level: User Goal

Stakeholders and Interests:
- Clock owner -User wants one of the alarms to be set at a time and go off at the correct time.

Precondition: Clock is on and is able to accept hours, minutes, seconds, and AM/PM settings for the alarms. Also, the software needs to distinguish between setting the alarm and setting the current time.The software need to know if the alarm is on or off. The software needs to make sure it goes off and makes a noise at the desired time.

Success Guarantees: The clock takes in the desired hours, minutes, seconds, and AM/PM settings and saves them in memory for alarm 1 or 2. The alarm will sound at the correct time as long as the user has not cancelled the alarm.

Main Success Scenario: The clock owner enters the alarm time into the alarm, and the software saves the time into memory. The software saves the desired time of 8:40 AM to alarm 1. The alarm goes off at 8:40 AM, and the clock owner wakes up at the correct time and is not late for work.

Extensions: The clock owner wants to cancel an alarm that is currently in the process of being set. The user will repeatedly press either the Alarm 1 or Alarm 2 button, and the software will recognize the cancellation of the alarm setting.

Special requirements: The software must recognize HH:MM:SS AM/PM format for displaying the time.

Open Issues: Does the software support military time? Will the software automatically adjust for Daylight Saving Time?

Use Case UC2: Switch Between AM/FM

Primary Actor: Clock Owner

Goal in Context: User is able to switch to switch between AM or FM radio stations

Scope: Dual Alarm Clock Radio Software

Level: User Goal

Stakeholders and Interests:
- Clock Owner: Wants the ability to listen to various stations on either AM or FM radio
- Guests: Want the ability to change the stations

Precondition: Clock is on and the software is able to recognize whether it is set to AM or FM. The software receive the radio waves when being tuned to a certain station.

Success Guarantees: User is able to tune the radio to the desired station on either AM or FM radio. The user is able to switch back and forth between AM or FM radio at any given time.

Main Success Scenario: The user turns on the radio on the clock. The radio is currently set to AM and is on a station that is only broadcasting a static sound. The user attempts to search for music while tuning through the stations (still on AM radio). The user switches the radio to FM radio and tunes the station to 95.9. The radio begins to play music with perfect clarity.

Extensions: While trying to find a station that is playing the desired genre of music, the user decides to not listen to music at all. The user presses the off button for the radio, and the software recognizes the signal to turn off.

Special requirements: The software must be able to receive input from antenna.

Open Issues: Does the software have the capability to work outside of the US?

Glossary:

- Dual Alarm AM/FM Clock Radio: A clock that supports the setting of two alarms and has the capability of receiving and interpreting radio waves to output information to the user.
- Vision: A short executive overview document for quickly learning the project's big ideas
- AM/FM: Amplitude Modulation and Frequency Modulation, respectively. These are forms of modulation in which either the amplitude(strength) or frequency of a carrier wave is varied. The clock radio can be used with either setting.
- Software: The part of the computer system that consists of encoded information or computer instructions.

Supplementary Specification:

- Functionality:
    - Functional requirements are captured via the defined use cases.

- Usability:
    - Human Factors:
        - The user should have the basic ability to read the buttons.
        The user will be able to see the the time and on a large LCD screen. Therefore:
        - The time should be easily read from more than a few meters away.
        - The color of the numerical digits will be in red with a black background for good contrast to aid those with poor eyesight.

- Reliability:
    - Failure rate of alarm to go off should be very low.

- Performance:
    - The radio should be able to tune to the desired station and start outputting music within a couple seconds.
    - The clock should respond immediately to the snoozing/disabling of the alarm.

- Supportability:
    - Software will not need to be updated
    - Configurability:
        - Different users may control which preset stations to use.
        - The alarms may be set to any time the user desires.

Interfaces:

    Noteworthy Hardware and Interfaces:

- LCD Screen
- Buttons:
  - Main On/Off
  - Alarm 1 On/Off
  - Alarm 2 On/Off
  - Radio Tune Up
  - Radio Tune Down
  - Volume Up
  - Volume Down
  - Adjust Hours
  - Adjust Minutes
  - Adjust Seconds