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Deliverable 1: Inception Documents

Vision:

As a team, we are going to design, model, and develop software for a dual-alarm AM/FM clock radio. We are modelling our GUI after the 1970s style of the alarm clock where the AM/FM frequencies for the radio were chosen using a sliding bar.

Brief Use Cases:

1. **Set time.** When the clock-radio is first turned on, the user chooses standard or military time and then sets the current time by clicking the *set time button*. This time will be displayed in large, bold numbers on the screen so they are able to be read at a distance. When the time is being set, the colon (:) in the middle of the time will blink so the user knows they are in *time-setting mode*. While the : is blinking, the user can use the *hour and minute* buttons on the side of the GUI to set the time to the current time.
2. **Set alarm times.** The user wishes to set an alarm for two different people (a *dual-alarm*). The user will choose which alarm they are setting (alarm 1 or 2) by sliding the *alarm-chooser toggle* from side to side. To set the first alarm for the first person, they will set the *alarm-chooser toggle* to the *alarm-1* position. They will then press the *set time button*, which is visible on the GUI. The : will begin to blink so the user knows they are in *time-setting mode*. Using the *hour and minute buttons*, they will adjust the time to the time they would like their alarm clock to go off. They will set the time for the alarm and then choose whether the alarm will go off or the radio will play. User also has the option to set no alarm at all by changing both the hour and minute digits to “00”. The user then moves the toggle to the *alarm-2* position to set the time for the second person’s alarm. They repeat the steps they completed to set the first alarm.

3. **Snooze the alarm.** The alarm goes off at the set time and the user has the option to either snooze the alarm or turn it off. The user presses the *snooze button* on the GUI, and the alarm pauses for 10 minutes before sounding again while the user falls back asleep. When the alarm sounds again, the user presses the *alarm off button* which turns the alarm off until the following day, when it will ring again at the set time.
4. **Turn off alarm.** When the alarm goes off, the user can hit the *alarm off button* to make it stop sounding. Alarm turns off until the the next day, when it goes off at the set time.
5. **Turn radio on.** The user is awake and would like to play the radio. On the GUI, they change the *mode toggle* to *radio mode* which puts the alarm clock into *radio mode* and turns the radio on; whatever the radio was previously playing will begin playing to whatever volume it was at the last time it was playing.
6. **Change between AM/FM mode.** The user is currently in *AM mode* and wants to switch to *FM mode* so they flip the *AM/FM toggle switch* from AM to FM.
7. **Adjust radio frequency.** While the alarm clock radio is in *radio mode*, the user wants to switch from the FM station of 99.7 FM to their favourite station, 102.4 FM. Using the *radio frequency slider* on the GUI, they increase the frequency until they can see the *frequency bar* on the slider line up with “102.4” on the FM layer.
8. **Adjust volume of the radio.** The user wants to increase the volume of the music playing on the radio station while it is in *radio mode* and set to *FM mode*. The user increases the volume by pressing the *+/- adjust radio volume buttons* on the GUI.

Fully Dressed Use Cases:

Use Case UC1: Set Alarm Times

Use Case Section	**Comment**
Use Case Name	Set alarm times
Scope	Dual-Alarm Clock AM/FM Radio Software
Level	User goal
Primary Actor	Alarm clock user #1
Stakeholders and Interests	Alarm clock user #1 (ACU1): - Wants a fast, intuitive way to quickly set both alarms for themselves and also for alarm clock user #2. Wants both alarms to go off reliably. Alarm clock user #2 (ACU2): - Wants to be guaranteed that alarm will go off at the chosen time set for alarm #2 so they may wake up on time.
Preconditions	Alarm is powered on, initial time has been set, all necessary buttons are functioning properly, user #1 knows the correct time

	they would like to be woken up as well as alarm user #2's desired wake-up time. System must also have a way to emit sound - sound must be on.
Success Guarantee (Postconditions)	Both alarm #1 and #2 are saved after user #1 sets them. Both go off reliably at the times they are set to go off and both users wake up on time to get started with their days.
Main Success Scenario (Basic Flow)	1. Alarm Clock User 1 (ACU1) wishes to set an alarm for themselves and ACU2 (a *dual-alarm*). 2. ACU1 will choose to set alarm 1 by sliding the *alarm-chooser toggle* to the *alarm-1 position*. 3. ACU1 will then press the *set time button*, which is visible on the GUI. The : will begin to blink so ACU1 knows they are in *time-setting mode*. 4. Using the *hour button* and the *minute button*, ACU1 will adjust the time to the time they would like their alarm clock to go off the following day (5:30AM). 5. ACU1 sets the time for alarm #1 and then choose that the alarm will go off by playing the radio by setting the *A/R alarm-radio button* to "R". 6. ACU1 presses the *set time button* again to save the settings for alarm #1. 7. ACU1 then moves the *alarm-chooser toggle* to the *alarm-2* position to set the time for alarm clock user 2's (ACU2) alarm. 8. ACU1 presses the *set time button* and the alarm clock goes into *time-setting mode*. 9. ACU1 sets the time to ACU2's preferred wake up time (6:45AM) using the *hour button* and *minute button*. 10. ACU1 chooses "A" using the *A/R alarm-radio button* so that the alarm will sound, not the radio, when alarm #2 goes off. 11. ACU1 presses the *set-time button* to save the settings for alarm #2.
Extensions	- At any time, ACU1 can choose to exit *time-setting mode* by switching the *mode toggle* to either *radio mode* or *time mode.* - At any time if the system is shut down or unplugged, once it is turned on it will have the settings it had before it crashed, but will not be in *time-setting mode*. 2-11 a. ACU1 can choose which alarm they are setting - it does not

	have to be done in order. Alarm #1 can be set and alarm #2 does not have to be set. b. If the user does not wish to set an alarm, they can set the alarm to 00:00 using the hour and minute buttons, which effectively means “no alarm” for either alarm #1 or alarm #2.
Special Requirements	- GUI must have digits that display the time in large numbers that can be read - Sound emitted from system must be audible from 3 feet away
Technology and Data Variations List	- All input must be done through the GUI, there is no other way to use the system.
Frequency of Occurrence	Occasional.
Miscellaneous	n/a

Use Case UC2: Adjust Radio Frequency

Use Case Section	**Comment**
Use Case Name	Adjust radio frequency
Scope	Dual-Alarm Clock AM/FM Radio Software
Level	User goal
Primary Actor	Radio user
Stakeholders and Interests	Radio user: - Wants a quick, simple way to find their radio station of choice.
Preconditions	System is powered on, system volume must be audible, *radio mode* must be turned on.
Success Guarantee (Postconditions)	Radio user is able to play the radio station of their choosing quickly and intuitively.
Main Success Scenario (Basic Flow)	1. User turns the radio on by switching the *mode toggle* to *radio mode*. Whatever station the radio is set on will play at whatever volume the volume has was set to previously. 2. Using the *radio frequency slider* on the GUI, the user increases the frequency until they can see the *radio*

	frequency slider line up with the numbers “102.4” on the *FM frequency panel*.
Extensions	- At any time, ACU1 can choose to exit *radio mode* by switching the *mode toggle* back to *time mode.* - At any time if the system is shut down or otherwise interrupted, once it is turned on it will still be in *radio mode*. 1a. If the user wants to change the volume that the radio is playing at, they can use the *+/- adjust radio volume buttons* on the GUI. 2a. If the user wants to change the radio to *AM mode*, they can toggle the *AM/FM toggle switch* and set it to “AM”.
Special Requirements	- GUI must have large enough digits on display to read the *AM frequency* or *FM frequency panels* as well as be able to distinguish between tens-place decimal numbers such as 99.8 and 99.9.
Technology and Data Variations List	- All input must be done through the GUI, there is no other way to use the system.
Frequency of Occurrence	Occasional.
Miscellaneous	n/a

Glossary:

Term	Definition
A/R alarm-radio button	Located next to the *set time button*, this button allows the user to choose whether the alarm or the radio will sound when the alarm goes off. Users know their choice because there is a little “A” or “R” on the GUI next to the alarm time being set when they are in *time-setting mode*.
alarm	Defined as an interruptive sound that signals it is time to set about a task. Examples of useful alarms are when they sound to wake up sleepers, signalling it is time for the sleeper to get up and go to work.
alarm off button	Located next to the *snooze button*, this button turns the sound of the alarm off until it is time for it to ring at its set time the next day.

alarm-1 position	When the *alarm-chooser toggle* is set to this position, it means that, while the system in is *time-setting mode*, the user is setting the time for the person who corresponds with the first alarm.
alarm-2 position	When the *alarm-chooser toggle* is set to this position, it means that, while the system in is *time-setting mode*, the user is setting the time for the person who corresponds with the second alarm.
alarm-chooser toggle	Toggle that allows for the user to choose between setting the alarm for the first person using the *dual-alarm* system or the second person. Toggle can be switched from *alarm-1 position* to *alarm-2 position.*
AM frequency panel	The standard bandwidth for AM is 540-1600 kHz, allowing for a possible 106 bands or “stations” to be played. This panel displays this range in digits above the *radio frequency slider.* The position of the *radio frequency slider* tells the user which station the radio is playing by pointing to the number corresponding to that station if the radio is in *AM mode*.
AM mode	When the *AM/FM toggle switch* is in this position, the radio is playing stations corresponding to where the *radio frequency slider* is pointing on the *AM frequency panel*.
AM/FM toggle switch	Toggle that allows the user to choose between playing *AM mode* or *FM mode*.
dual-alarm	An alarm system that allows for two persons to have differing alarms. Each alarm goes off at its set time and when the *alarm off button* is pressed to stop the first alarm from ringing, it does not interfere with the workings of the second alarm.
dual-alarm AM/FM clock radio	The system we are implementing - this is a system that has both an alarm and a radio mode. The alarm is able to be set for 2 different times per day and the radio can play either AM or FM stations, depending on what the user wants to hear.
FM frequency panel	The standard bandwidth for FM is 88.1-108.1 MHz, allowing for a possible 100 bands or “stations” to be heard. This panel displays this range in digits above the *radio frequency slider.* The position of the *radio frequency slider* tells the user which station the radio is playing by pointing to the number corresponding to that station if the radio is in *FM mode*. This is located on the radio frequency
FM mode	When the *AM/FM toggle switch* is in this position, the radio is playing stations corresponding to where the *radio frequency slider* is pointing on the *FM frequency panel*.

Graphical User Interface (GUI)	The user interface for the system, this is how the user interacts with the system. It displays a graphical representation of the *dual-alarm AM/FM clock radio.*
hour button	Range 0-12 in *standard time* or 0-24 in *military time.* The button to set the hour time when the alarm clock is in *time-setting mode*. Numbers only increase and, when the digits reach either 12 in *standard time* or 24 in *military time*, the digits wrap around and begin at 0 again.
military time	Time is displayed in the range of 00:00 - 23:59. No AM or PM is necessary.
minute button	Range 0-59. The button to set the minute time when the alarm clock is in *time-setting mode*. Numbers only increase and, when the digits reach 60 in *standard time* or *military time*, the digits wrap around and begin at 0 again.
mode toggle	There are 3 positions this toggle can be in: Radio, Time, and Time-Set. When it is in the Radio position, the system is in *radio mode*. When it is in the Time position, the system in the *time mode*. When it is in the Time-Set position, the system is in *time-setting mode.*
radio	A device which plays AM or FM bands, referred to as “stations”. An example of a radio station is “102.5 FM”.
radio frequency slider	The *AM and FM frequency panels* are located above and below the slider. The slider has a vertical bar that can be dragged left and right using the *GUI* to change the digits that it points to and therefore the radio station that is playing.
radio mode	When the radio is on and the *mode toggle* is set to the “Radio” position.
set time button	When the user presses this button in *time-setting mode*, the : begins to blink on the time and the user is able to use the *hour button* and the *minute button* to set the desired time for their alarm. Once this button is pressed again, it saves the alarm time.
snooze button	Located next to the *alarm off button*, this button allows the user the option to snooze. When pressed, this button pauses the alarm for 10 minutes and then the alarm resumes ringing when the 10 minutes is complete.
standard time	Time is displayed in the range of 00:00 - 12:00 and morning is denoted by a small “AM” display while afternoon is denoted by “PM”.

time mode	When the system is simply displaying the time, not playing the radio, and is not in *time-setting mode.* The *mode toggle* is set to the “Time” position.
time-setting mode	When the user is changing the set time for either of the two alarms. The *mode toggle* must be set to the “Time-Set” position.
+/- adjust radio volume buttons	When the system is in *radio mode*, the user can use these buttons to increase or decrease the volume level.