

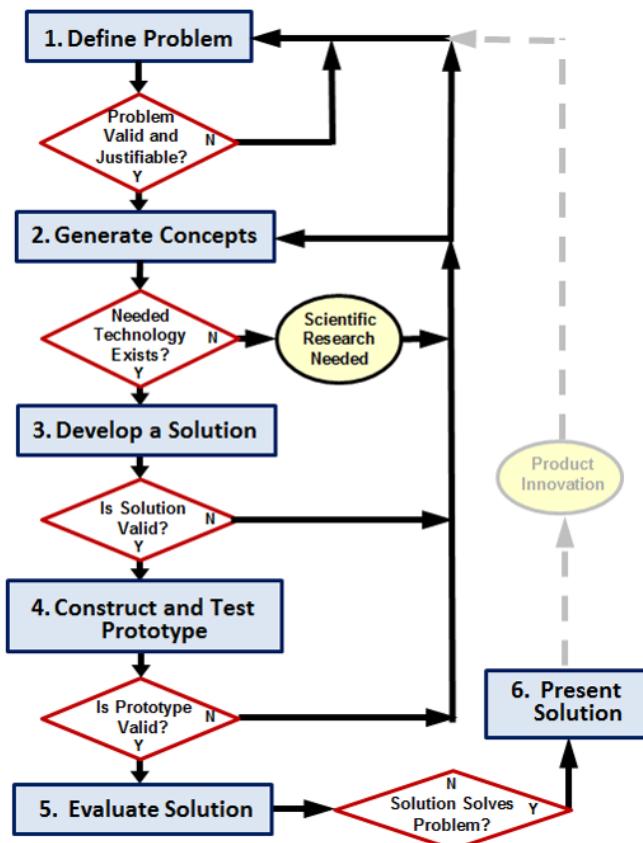
Build Your Final App

Introduction

You have created several apps over the course of the semester. Now you have design freedom to create an app which you feel best showcases your abilities as an App Designer. You must now plan, design and build a working version of your Final App.

This app will be the culminating project of the course and as such must provide evidence of your understanding of the learning targets:

- ICS.1A.U2.S2 Write and test modular code to incrementally create a program
- ICS.1A.U2.S3 Use tools of a language and development environment to create original programming solutions
- ICS.1A.U3.S1 Construct a user interface
- ICS.1A.U3.S2 Evaluate a program by criteria such as accessibility and usability
- ICS.1B.U2.S1 Encapsulate a set of related statements in a function or procedure
- ICS.3B.U1.S1 Present a product that solves a problem or expresses creativity
- ICS.3B.U1.S2 Communicate an idea for a product that solves a problem or expresses creativity
- ICS.3F.U1.S2 Be creative when identifying problems and possible solutions

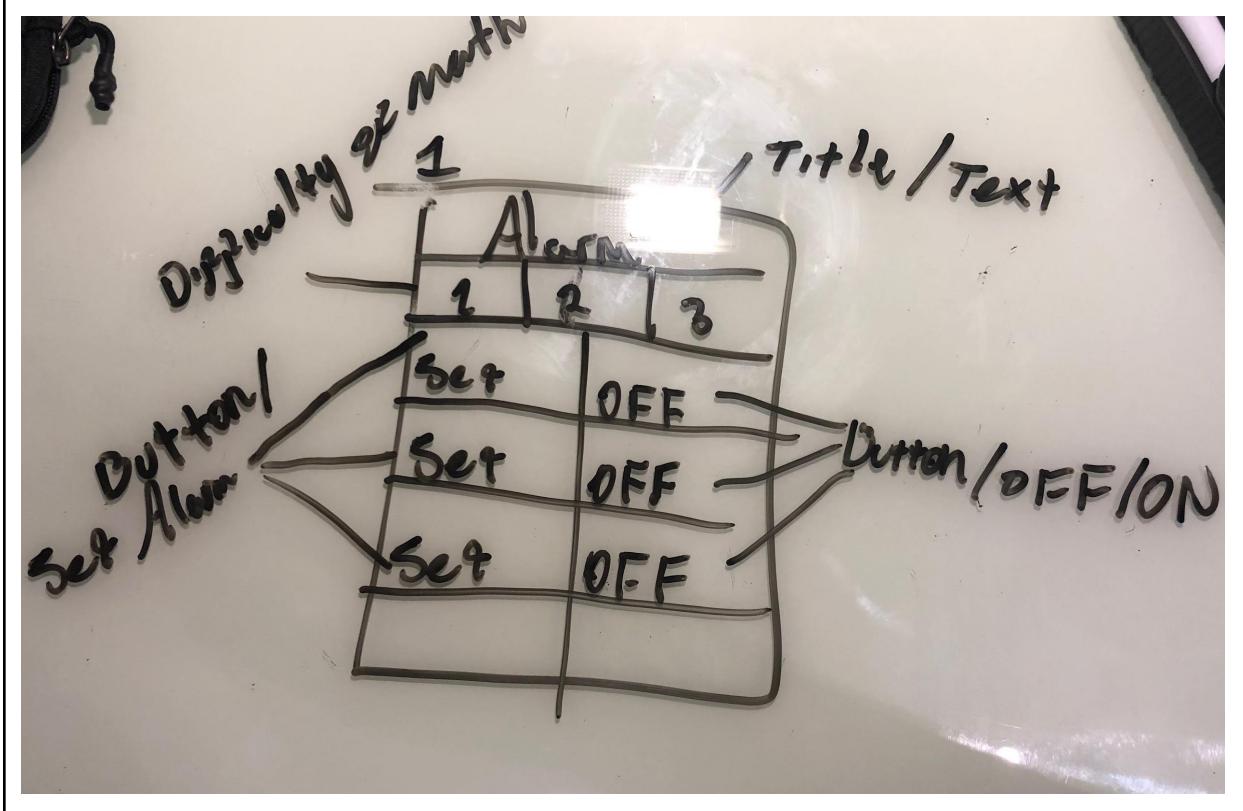


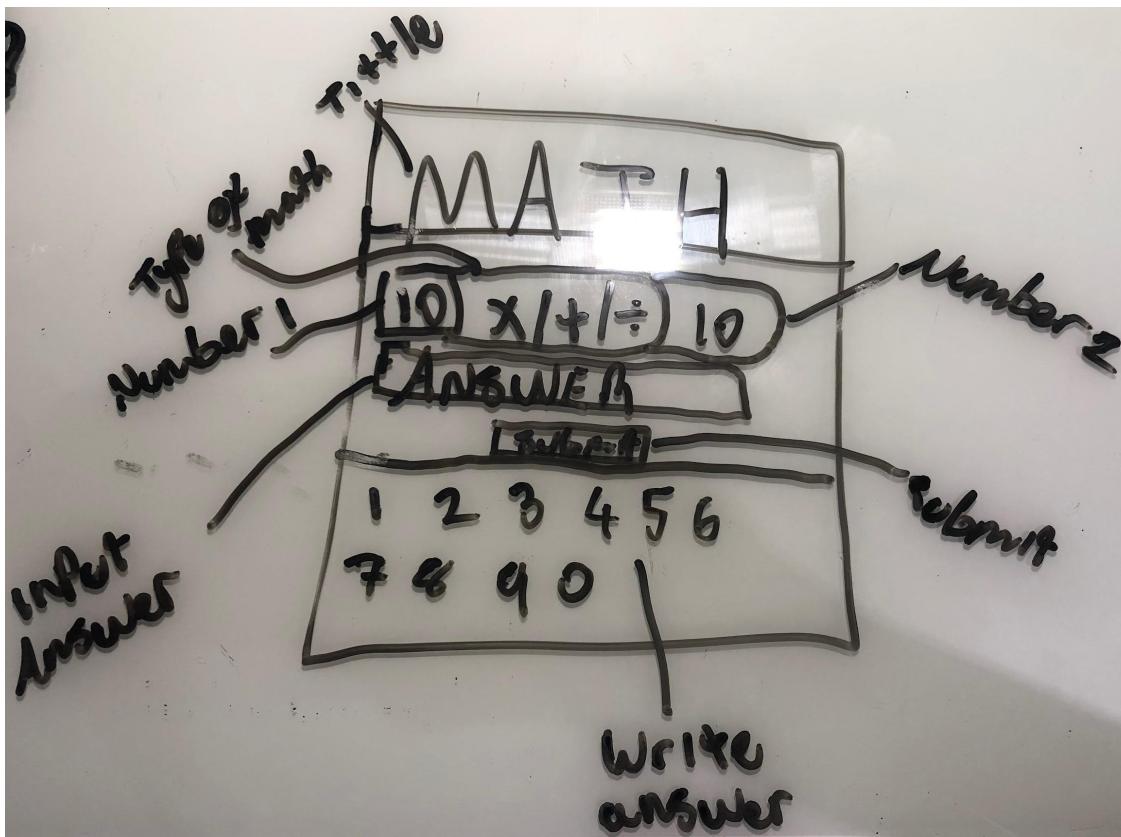
DEFINE THE PROBLEM

Who will the App be designed for?	The app will be designed mainly for students, but it is also built for adults who wish to practice their math skills in their worst moments.
What do you want the App to do?	<p>The app is basically an alarm with math. The app is designed to wake the person up. It has the function of an alarm and everything that would come with an alarm. The only difference is that to turn off the alarm you will need to do a math problem and solve it. Or else the sound of the alarm will continue to play, and it can only be turned off by solving the math problem. The app is designed with many different alarms so you can have more than one. To insert the alarm you will need to press the button (Set Alarm) and a notification will pop up giving you time. You can scroll through the numbers and set the alarm as you wish. To turn on the alarm you will need to press the OFF button. Then it will be on. Once it starts making an alarm sound, you will press the off bottom and it will take you to the math problem.</p> <p>When you enter the math problem page you will see the question and you will answer it by pressing the buttons below. Once you've got the answer you press submit. If it's correct you can turn off the alarm if it's not the sound will continue to play and you will have to do another question. In addition, every math question will be different. If you get the math question incorrect you will have to try again but with different numbers. The math question will only be about multiplication between the numbers 2-15.</p> <p>My goal is to have the student improve their mental math and also to help the brain warm up when you wake up. Hopefully, this will serve as a great help for their school.</p>
Write a Design Statement Describe What the App will do and Who it will be for	The app is an Alarm that when inserted a time will turn on. You will know when the alarm has reached the time when it's doing an annoying sound. To turn off the alarm you will have to do a multiplication problem. If correct the annoying sound will stop playing, but if the answer is incorrect the annoying sound will not stop and you will have to do a different multiplication question.

GENERATE CONCEPTS / DEVELOP A SOLUTION

Insert sketches of your Design Ideas here:

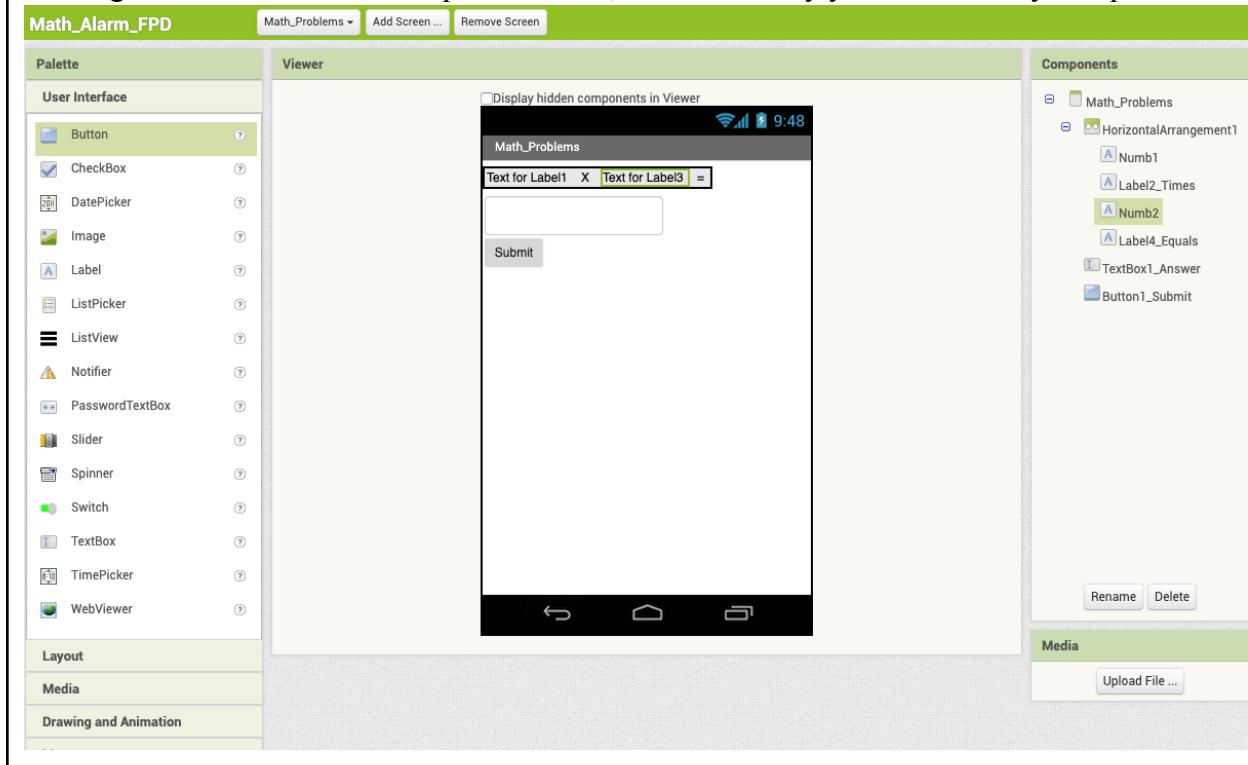




CONSTRUCT YOUR PROTOTYPE

Prepare a beta version of your app and include screenshots of the **DESIGN VIEW**:

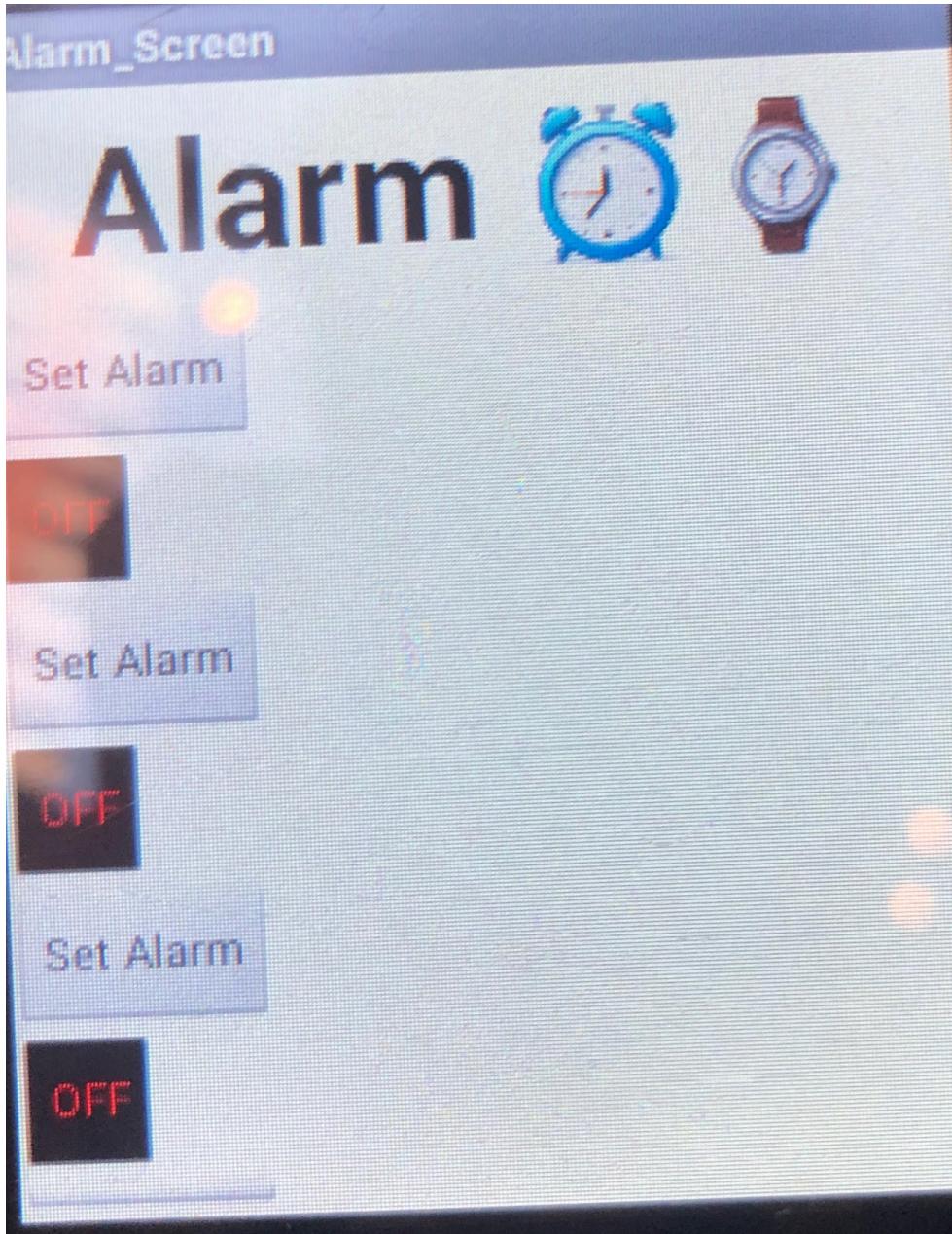
On the first image, you can see you can see a rough draft of the math multiplication screen, and you can also see that the components have different names. On the second image, you can see the rough draft of the Alarm in a phone screen, and that is why you can't see any components.



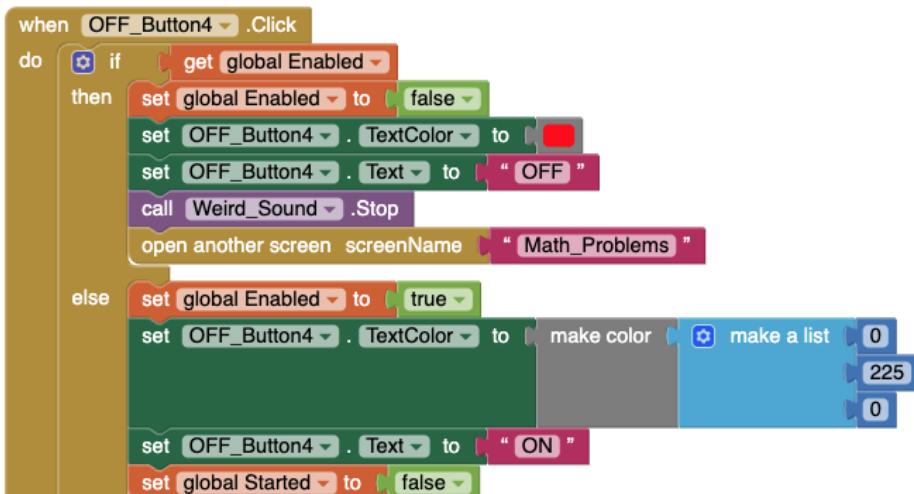
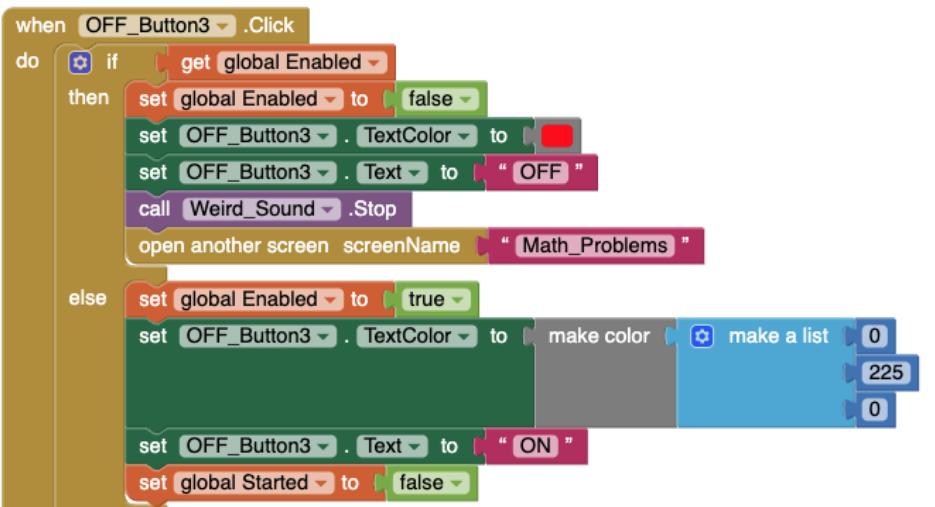
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Prepare a beta version of your app and include screenshots of the **BLOCKS VIEW**:



```
when [OFF_Button2].Click
do
  if [get global Enabled v] then
    set [global Enabled v] to [false]
    set [OFF_Button2].TextColor to [red]
    set [OFF_Button2].Text to ["OFF"]
    call [Weird_Sound].Stop
    open another screen [screenName v] ["Math_Problems"]
  else
    set [global Enabled v] to [true]
    set [OFF_Button2].TextColor to [make color [0 v] [225 v] [0 v]]
    make a list [0 v] [225 v] [0 v]
    set [OFF_Button2].Text to ["ON"]
```



initialize global [Time] to 0

initialize global [Hour] to 0

initialize global [Minute] to 0

initialize global [Enabled] to false

initialize global [Started] to false

when ALARM4 .AfterTimeSet

do set global Hour to ALARM4 . Hour

set global Minute to ALARM4 . Minute

when ALARM2 .AfterTimeSet

do set global Hour to ALARM2 . Hour

set global Minute to ALARM2 . Minute

when ALARM_CLOCK <= Timer
do set global Time to call ALARM_CLOCK Now

get global Minute → end if get global Time →
call ALARM_CLOCK At Minute instant → get global Time →
get global Hour → end if call ALARM_CLOCK At Hour instant → get global Time →
and → not get global Enabled → and → not get global Started →

then set Global Started to true
call Wenz Sound = Start
set Wenz Sound = Loop → to true
else

```
when ALARM1 .AfterTimeSet
do set global Hour to ALARM1 . Hour
set global Minute to ALARM1 . Minute
```

```
when ALARM3 .AfterTimeSet
do set global Hour to ALARM3 . Hour
set global Minute to ALARM3 . Minute
```

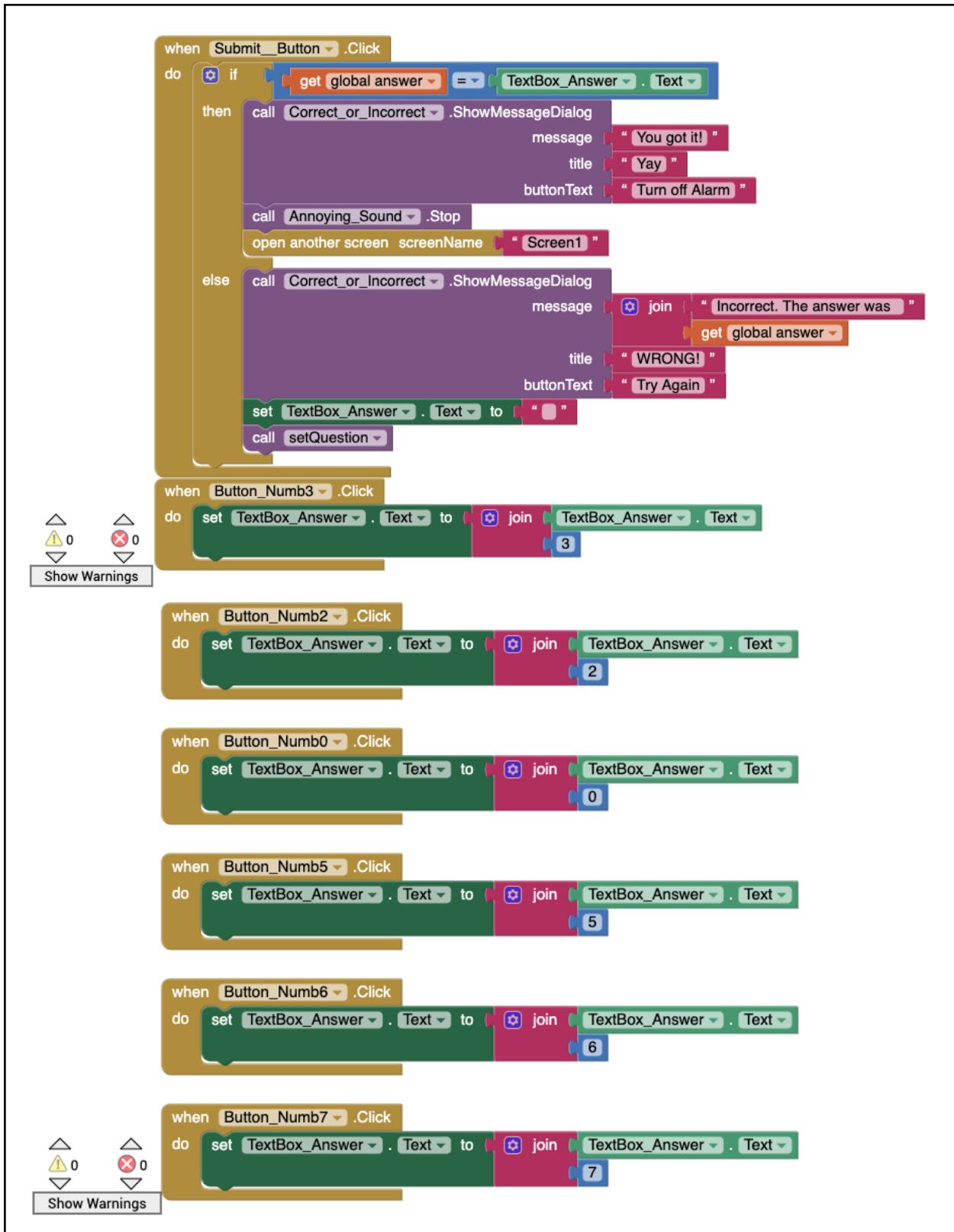
```
[@] to setQuestion
do set global num1 to random integer from 5 to 10
set global num2 to random integer from 5 to 10
set global answer to [+] get global num1 x get global num2
set Number1 . Text to get global num1
set Number2 . Text to get global num2
```

```
when Math_Problems .Initialize
do call setQuestion
call Annoying_Sound .Start
```

```
initialize global num1 to 0
```

```
initialize global num2 to 0
```

△ 0 ▲ 0 initialize global answer to 0



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The image shows a Scratch script consisting of four separate event blocks, each triggered by a button click:

- The first block is "when Button_Numb9 .Click":
do [set TextBox_Answer .Text to (join (TextBox_Answer .Text) (9))]
- The second block is "when Button_Numb1 .Click":
do [set TextBox_Answer .Text to (join (TextBox_Answer .Text) (1))]
- The third block is "when Button_Numb8 .Click":
do [set TextBox_Answer .Text to (join (TextBox_Answer .Text) (8))]
- The fourth block is "when Button_Numb4 .Click":
do [set TextBox_Answer .Text to (join (TextBox_Answer .Text) (4))]

The script uses the `join` operator to concatenate the current value of the `TextBox_Answer` variable with the digit from the button click, effectively building a number digit by digit.

TEST YOUR PROTOTYPE

Now that you have a prototype... get feedback about the App from your prospective users. Meet with your "clients" and solicit constructive criticism about the design, functionality, usability, and fun of your App.

1. **Attend the meeting prepared.** Bring an Android phone with your app loaded on it ready to be demonstrated. Bring your laptop, or notebook and writing utensils to the meeting.
2. **Take notes during the interview.** You will need to explain what you designed and your reasoning for the layout, functions, etc. Ask them for their feedback on what you have created. **Record** ideas, information, and details here:

MEETING RECORDS	
Who did you meet with?	_____
What did they say about your Design ?	So when I set the Alarm I don't see the time I've set on. I would recommend you to do that.
What did they say about the Usability of your App?	It's weird/confusing. You have to turn it on and off yourself. It's better to be automatic. Maybe if you want you should change the sound to a more relaxing one.
Did they have any additional comments ?	The design is very common and I would like it to be more spread.

MEETING RECORDS	
Who did you meet with?	Mr. _____
What did they say about your Design ?	That it looked good and kind of appealing. On the other hand, he said to make the letters of the Alarm bigger, because when a person wakes up they wouldn't like to force their eyes too much. In addition, he also mentioned that I should make it prettier and more visually appealing.
What did they say about the Usability of your App?	He said that everything looked good and that it was a good idea. He also said that I should make the letters bigger in my Alarm and that I should occupy all the space in the screen so it's more visually appealing. He also mentioned putting numbers on the screen so the user wouldn't need to use the keyboard. He also said to make the math problems easier. A day after: You should also put difficulties for the app. So one is harder than the other one.

Did they have any additional comments?	He said that I should increase the volume of the sound every 5 seconds but when we tried to do it together we saw that it wasn't possible.
----------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------

MEETING RECORDS	
Who did you meet with?	Mr. ____
What did they say about your Design ?	I liked the design. Plus, I don't have high standards for this type of projects so I think it's great.
What did they say about the Usability of your App?	I liked the idea that it's no regular alarm and that it makes you do math in your worst moments and helps train your brain.
Did they have any additional comments ?	No additional comments.

3. **Identify one piece of feedback that you are going to take action on.** Describe the feedback that was given (positive or negative) in clear detailed prose and what you are going to do to incorporate the change into your app.

Interview with ____ : I'm going to make the app more appealing for the user, and I will also try to improve the design of the app. Although ____ mentioned for me to change the sound, I will not because if the person wants to wake up then the sound must be annoying/disturbing.

Interview with Mr. ____ : I'm taking into consideration to work on making the alarm bigger and more legible. I will also include numbers in the screen so the user does not need to use the keyboard. I will also make the math problems easier for the user to solve. Moreover, I will try to make the alarm screen more pretty. I will also include difficulty for the math questions.

Interview with Mr. ____ : When I did the interview with Mr. ____, he only said good things about my app so there is nothing I could improve in it.

DEVELOP YOUR FINAL SOLUTION

Now that you have gotten some feedback and brainstormed on how to use it; it's time to revise your app. Use the feedback to make your app better, more user-friendly more functional, etc. Remember to take into account any changes or requests made from your interviewee(s).

1. Include a screenshot of the **FINAL DESIGN VIEW** here:

As you can see below there is the Alarm design part. As I was saying on top; To insert the alarm you will need to press the button (Set Alarm) and a notification will pop up giving you time. You can scroll through the numbers and set the alarm as you wish. To turn on the alarm you will need to press the OFF button. Then it will be on. Once it starts making an alarm sound, you will press the off bottom and it will take you to the math problem. In addition, as you get used to the problems or they are just too easy for you. You can choose the difficulty of the math problems.

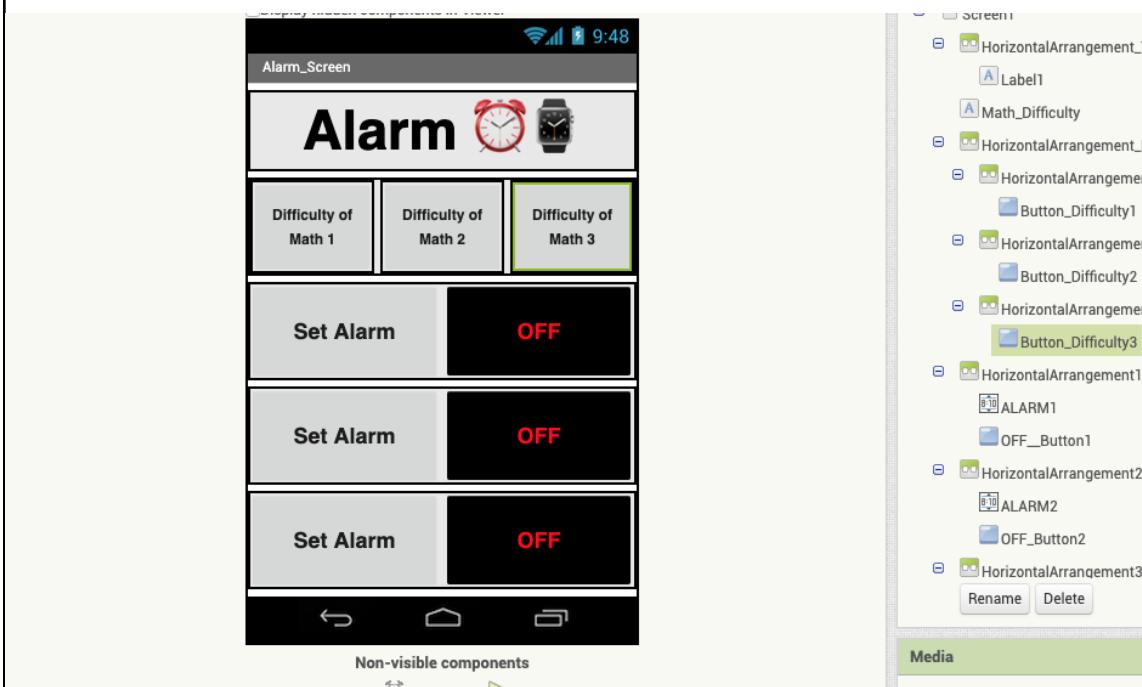
Difficulty 1 = Addition problems

Difficulty 2 = Multiplication problems

Difficulty 3 = Division problems

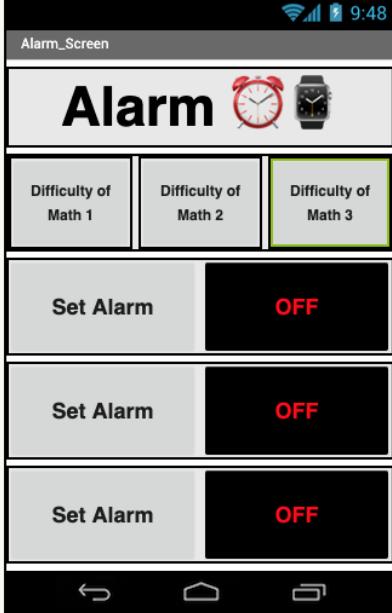
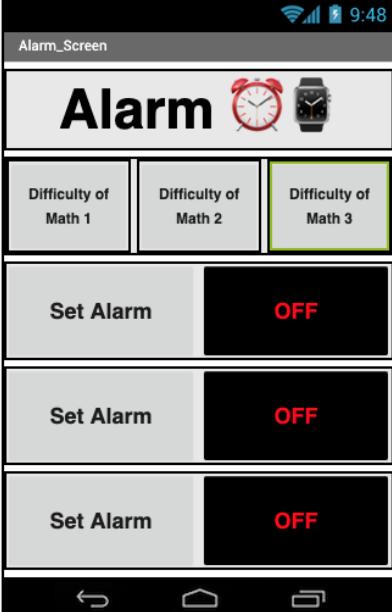
I have to make it big and spacy so it could be seen better and if the screen was empty it wouldn't be as visually appealing as now. I also choose the color of OFF to be red and the color of ON to be green so the app could be more colorful and more friendly to the user (On the images below you'll see the components full name)

As you can see I followed the feedback that ___ and Mr. ___ gave me of making the buttons larger and making difficulty levels for the math problems.



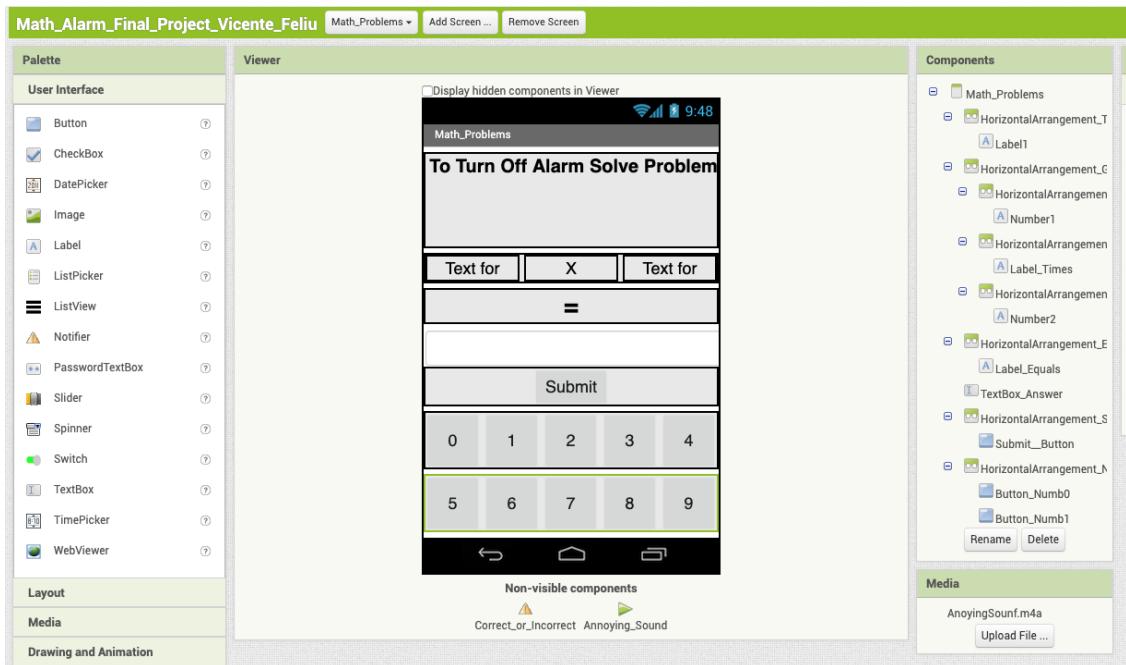
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<p>Viewer</p> <p><input type="checkbox"/> Display hidden components in Viewer</p>  <p>Non-visible components</p> <p>ALARM_CLOCK Weird_Sound</p>	<p>Components</p> <ul style="list-style-type: none">en1horizontalArrangement_TitleLabel1ath_DifficultyhorizontalArrangement_DifficultyHorizontalArrangement_Difficulty1<ul style="list-style-type: none">Button_Difficulty1HorizontalArrangement_Difficulty2<ul style="list-style-type: none">Button_Difficulty2HorizontalArrangement_Difficulty3<ul style="list-style-type: none">Button_Difficulty3horizontalArrangement1_Alarm1<ul style="list-style-type: none">ALARM1OFF_Button1horizontalArrangement2_Alarm2<ul style="list-style-type: none">ALARM2OFF_Button2horizontalArrangement3_Alarm3<ul style="list-style-type: none">ALARM3 <p>Rename Delete</p> <p>Media</p> <p>AnoyingSounf.m4a</p> <p>Upload File ...</p>
<p>Viewer</p> <p><input type="checkbox"/> Display hidden components in Viewer</p>  <p>Non-visible components</p> <p>ALARM_CLOCK Weird_Sound</p>	<p>Components</p> <ul style="list-style-type: none">HorizontalArrangement_CHorizontalArrangement_DHorizontalArrangement_E<ul style="list-style-type: none">Button_Difficulty1HorizontalArrangement_F<ul style="list-style-type: none">Button_Difficulty2HorizontalArrangement_G<ul style="list-style-type: none">Button_Difficulty3HorizontalArrangement1_Alarm1<ul style="list-style-type: none">ALARM1OFF_Button1HorizontalArrangement2_Alarm2<ul style="list-style-type: none">ALARM2OFF_Button2HorizontalArrangement3_Alarm3<ul style="list-style-type: none">ALARM3 <p>Rename Delete</p> <p>Media</p> <p>AnoyingSounf.m4a</p> <p>Upload File ...</p>

As you can see on the image below there is a lot going on. Once you press OFF on the Alarm screen, the math screen will pop up. Once that happens, where it says "Text for" and "Text for" numbers will appear. When the numbers appear you will need to do the math and once you have an answer you will type in your answer using the buttons on the end of the screen. Once you include your answer you will press submit. If the answer is correct a notification will pop up and say "Yay you got it" and "Turn off the alarm" once you press that the sound will stop. However, if you get the answer incorrectly then a notification will pop up saying "Wrong, Your answer was ____" then you will press try again. When you press "Again" the question will change and the box will empty on its own. Once you press "Turn off Alarm" the app will take you back to the first screen "The alarm screen." As you can see every component has a unique name and when using it on the phone, everything fits on the screen.

You can also see that I followed the feedback Mr. ___ gave me, putting the numbers in so the user does not need to use the keyboard to put the answer.



Below you will see the components with more detail:

The screenshot shows the MIT App Inventor interface with the following details:

- Project Name:** Math_Alarm_Final_Project_Vicente_Feliu
- Screen:** Math_Problems
- Components (Visible):**
 - Text for (top)
 - X (middle)
 - Text for (bottom)
 - = (center)
 - Submit button
 - Number buttons (0-9) in two rows
 - Non-visible components: Correct_or_Incorrect and Annoying_Sound
- Components (Listed in Components Panel):**
 - ems
 - alArrangement_Title
 - 1
 - alArrangement_GeneralBox
 - ontalArrangement_Numb1
 - mber1
 - ontalArrangement_X
 - bel_Times
 - ontalArrangement_Numb2
 - mber2
 - alArrangement_Equals
 - _Equals
 - Answer
 - alArrangement_Submit
 - it_Button
 - alArrangement_Numbers_Answer_1
 - n_Numb0
 - n_Numb1
- Media:** AnnoyingSound.m4a
- Buttons:** Rename | Delete

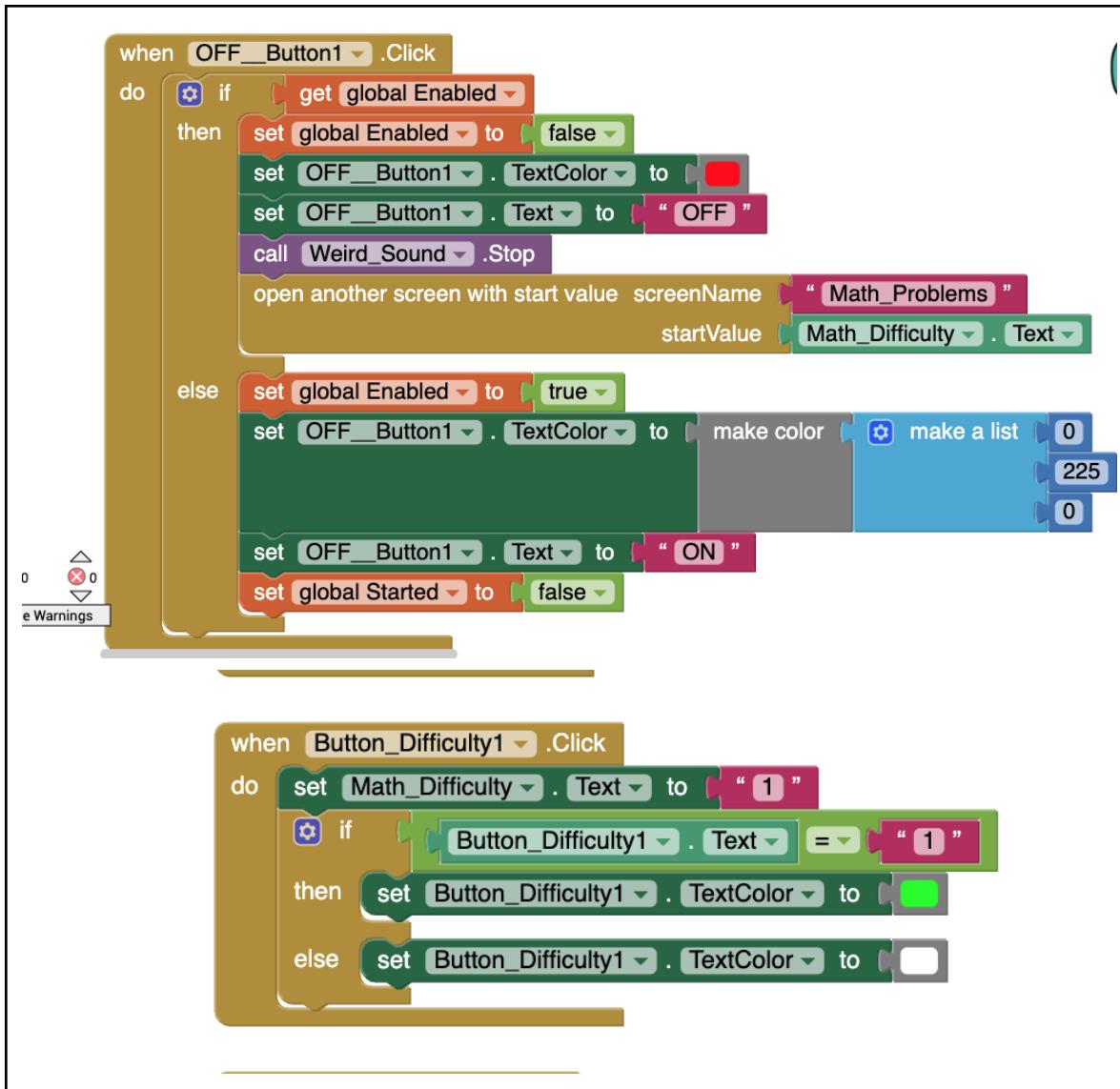
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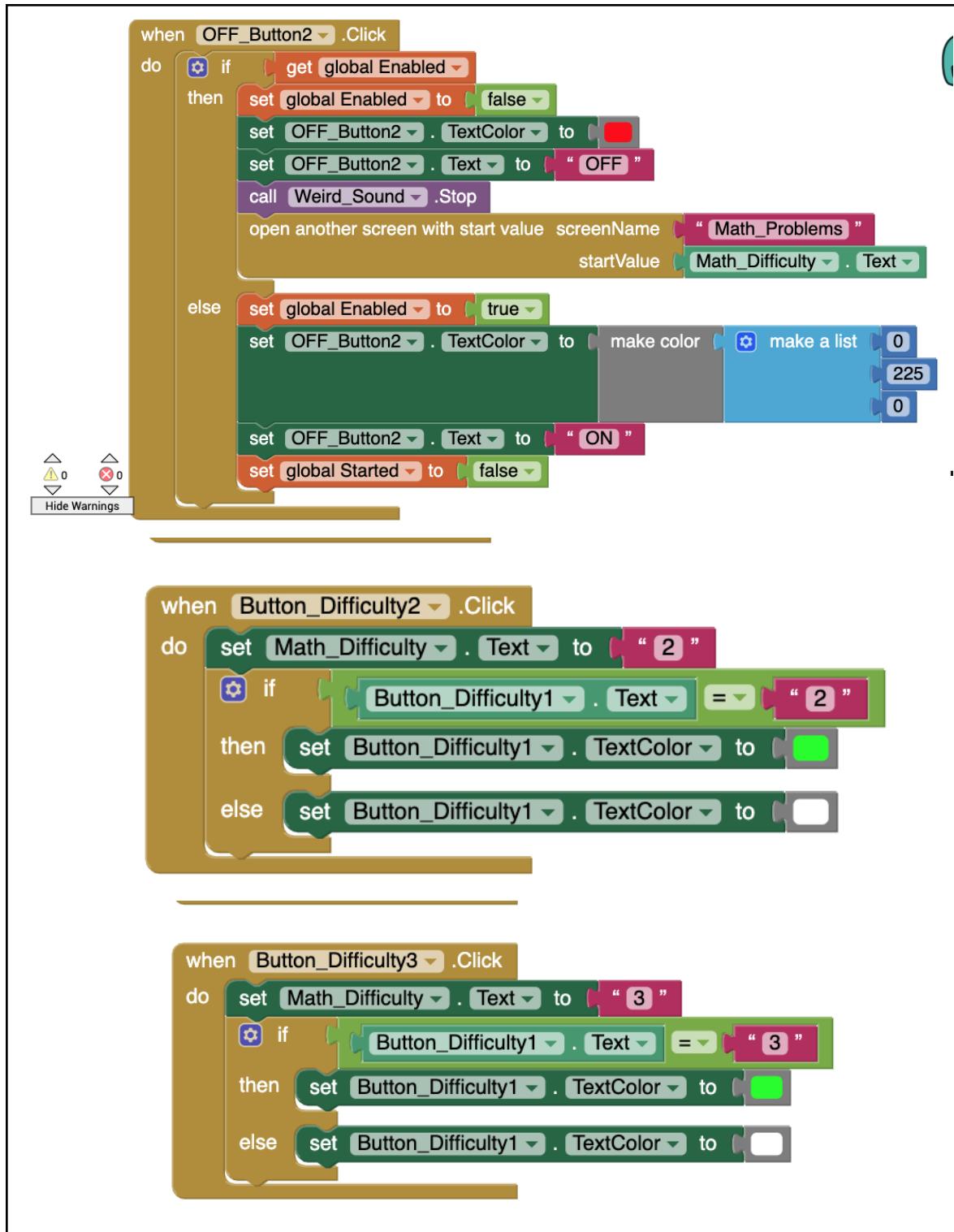
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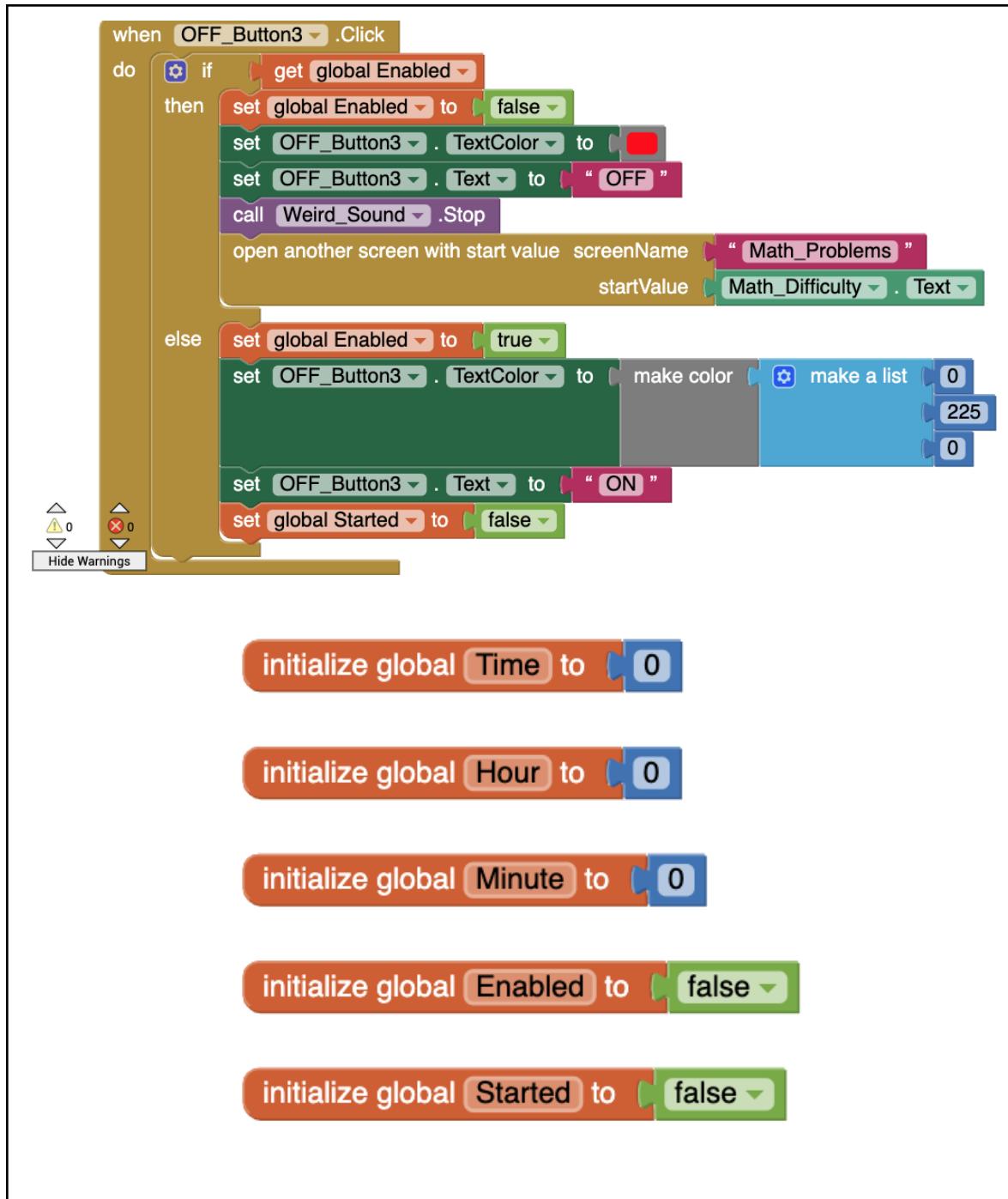
2. Include a screenshot of the **FINAL BLOCKS VIEW** here:

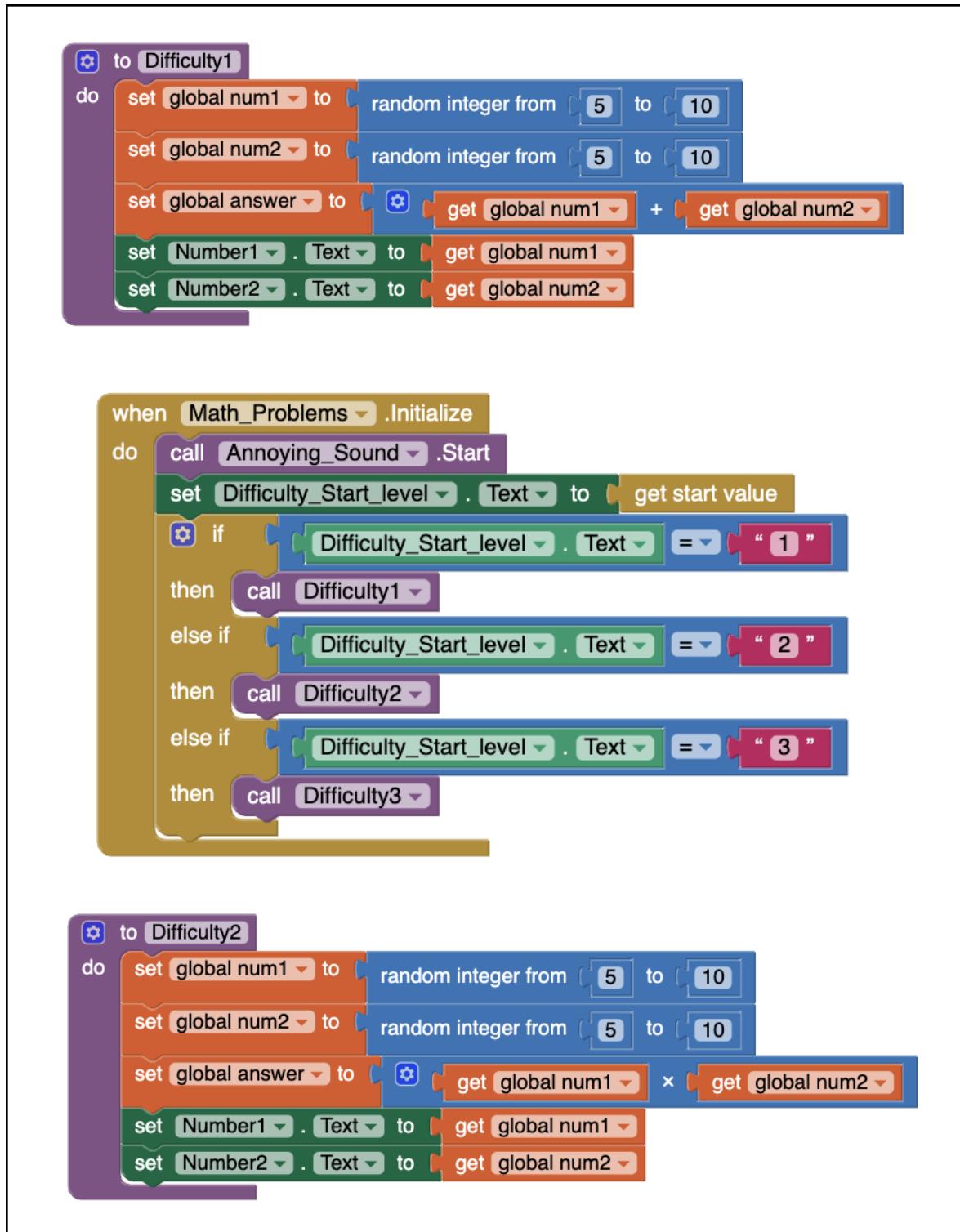
Below you will see the coding. To be honest, I used a youtube video to guide myself into making an alarm. On the other hand, once I finished watching the youtube video my code was still wrong and the app was malfunctioning so I had to fix some of it. Moreover, I did the Math problem coding all by myself and some help from Mr. _____. I choose to do the Random integers 5-10 so it wouldn't be hard or easy. Moreover, I don't think a person would like to do 49×32 when they are waking up. Plus if the problems are too hard for the person they can always change the difficulty.





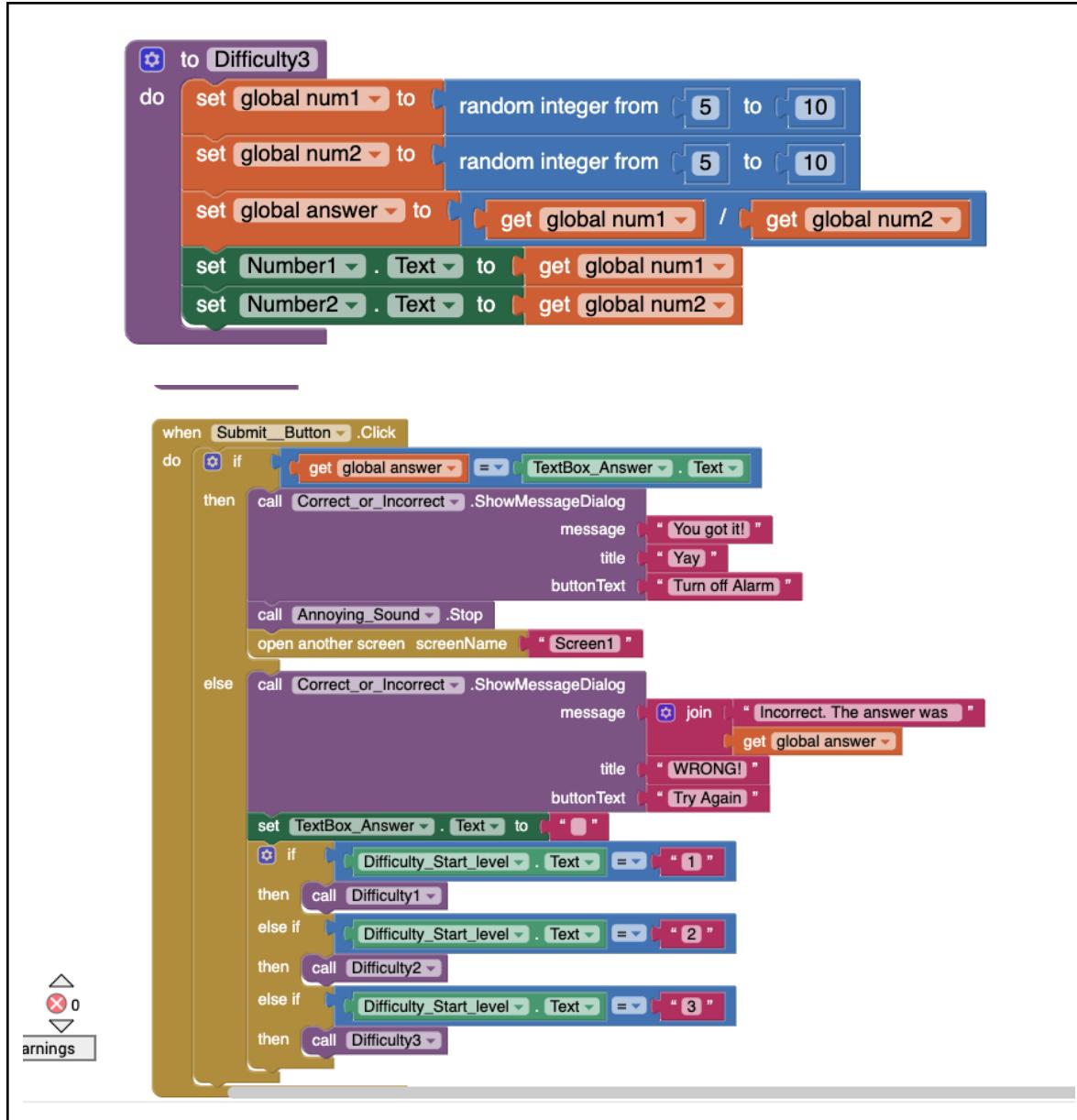


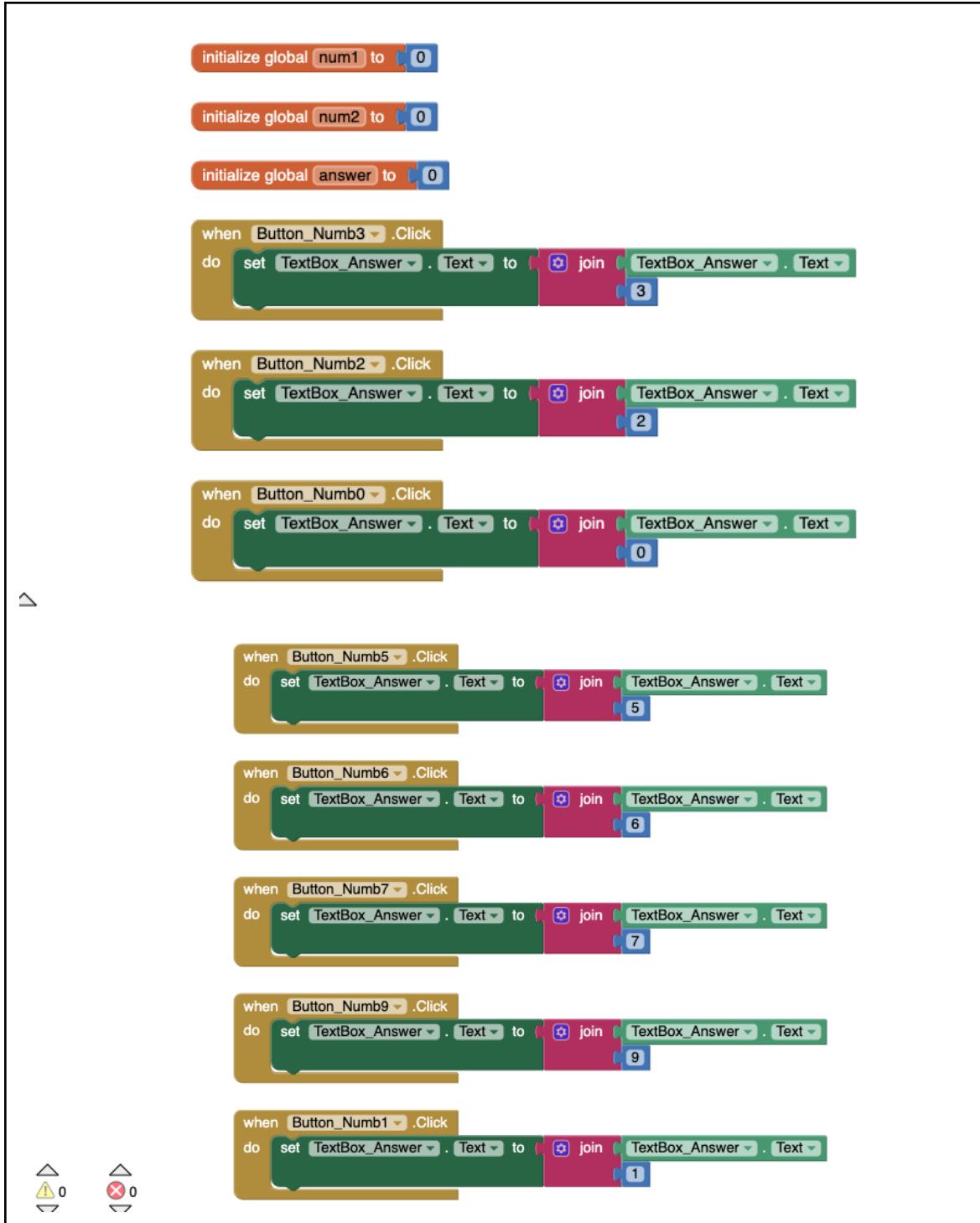


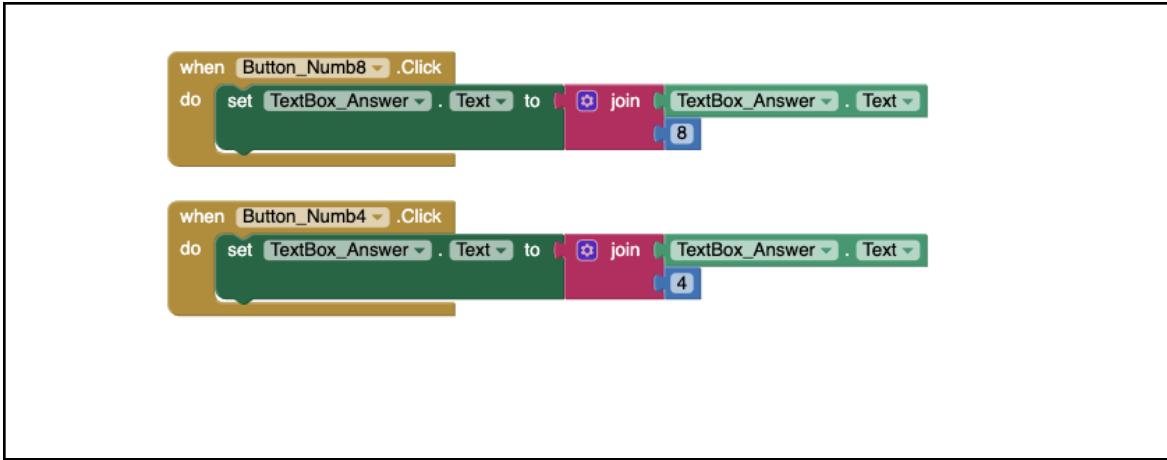


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**PRESENT YOUR FINAL SOLUTION**

Export the AIA file from MIT App Inventor and upload the file to Google Drive. **Share** the file by including the link to the file here

REFLECT ON YOUR APP

You should aim to write a few paragraphs to answer each of the questions below. These should not be descriptions of your LEARNING HABITS during this process. You should answer with specifics about the design and coding.

What worked?

Explain in detail what part(s) of the design and coding worked well and what you may be proud of accomplishing.

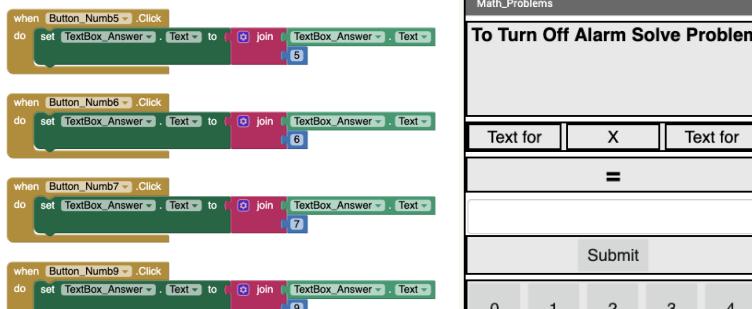
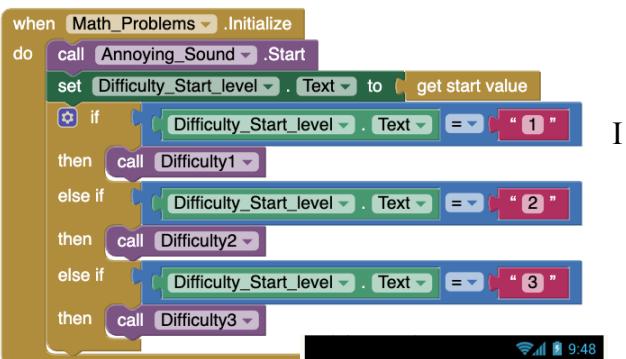
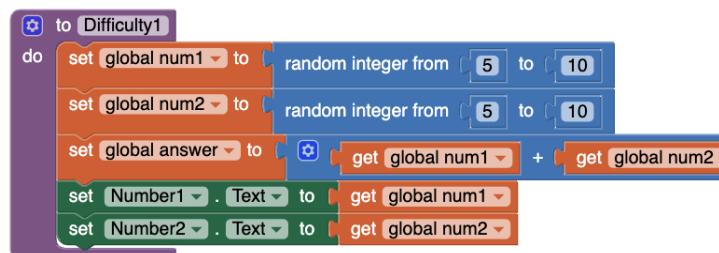
In my app, everything works (except one thing) and the design is visually appealing and good.

In my app, I'm proud of doing many things. Firstly I'm proud that I was one of the first to finish my app (never happens), and I'm proud that for once my app serves its purpose at its best. Some people might say that this app is useless and that it might piss off people, but I think that this app has a good purpose of starting the day with a warmed up brain and waking the user up for good. I'm also proud of doing the alarm and connecting it to the math problems, which was really difficult to do. I'm proud of managing to make the math part of the app all by myself, although to be honest, I did as some help to Mr. Hudosn. I was really surprised to see that everything in the app worked, and also that it came out to be a really good app.

I think that I'm most proud of making the difficulty for the math questions.

When Mr. ___ recommended me to do a difficulty for the math questions so the user could challenge

themselves I didn't feel like doing it. Plus I really didn't know to start, so I asked for help. Once I started I kind of knew how to continue and what to do. So by the end of it, was really proud of how it turned out to work.



In addition, I'm really proud of how I managed to do the number icon (on the math screen) and that it actually worked on my first try. I did this because Mr. ___ thought that

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the user would not like to use the keyboard with the small letter after they wake up, and he is right.

What didn't work?

Explain in detail what part(s) of the design and coding you couldn't get working and what you may have been disappointed you couldn't get to work.

When I first starting making the alarm I had a video from youtube to guide me through it since I didn't even know where to start. What didn't work though was a lot of the coding the video was giving me. Therefore I had to change some of it and edited so it fitted my idea and not just an alarm. For example; when I used some of the codings from the video to make my alarm, the sound was not playing for some reason. To fix it I had to add the sound to every OFF button coding and I had to take it out from the AlarmClock coding.

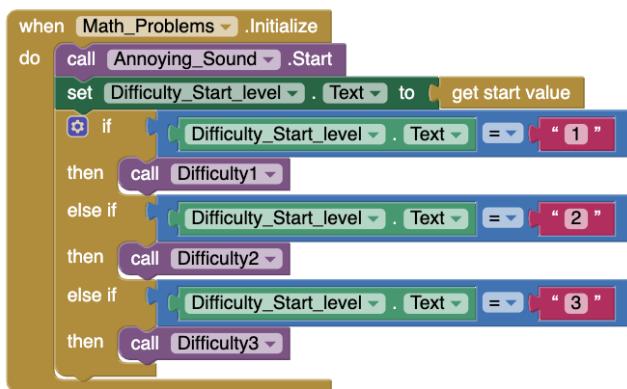
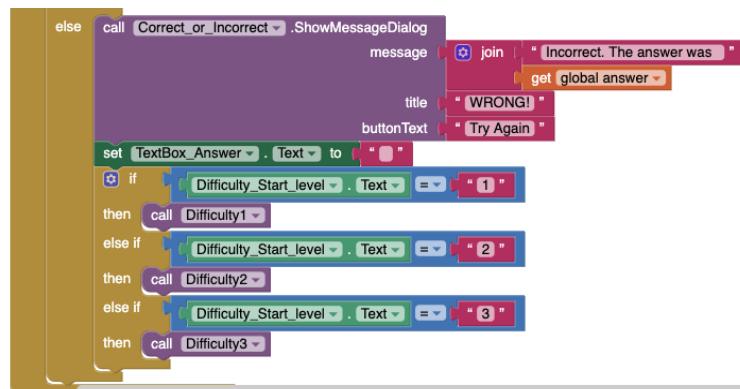
I also had a lot of problems and steps with doing my math screen and get it to work with sound and everything. My solution, in the end, was just to start the sound once the user enters the math screen.

Moreover, I had a lot of help from Mr. ___ to do the difficulty of the math questions. For example, I had a lot of trouble getting the difficulty to be the same when the user had missed the question (Image on the right). Another example of me having a lot of trouble was transferring data from one screen to the other. One way to do that is using a database the when initialize another screen you would open the database to

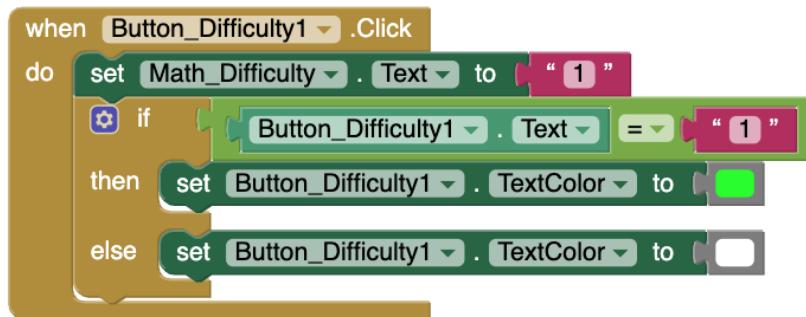
whatever you named it and then you would use that data from screen one in screen

two. However, the way I did it was rather easier. What I did is to put the difficulty buttons on screen 1 and then put the code on the right: That codes can transfer data from one screen to the other. Then once the screen two would initialize it would connect the text from

"Difficulty_Start_level" (which is on screen 1) to numbers in screen two. After doing that I would just do a procedure for each difficulty level where each level had different math problems (code on the right represents everything I just said but visually.)



Although my whole app works and it's 100% functional and it serves its purpose, there is one thing that doesn't seem to work. When I press the difficulty button I want the user to be aware that it's activated. So what I thought about was changing the color of the text when it's pressed. When activated I wanted the color of the text to be green, when not activated I wanted the color of the text to be white. However, as I said, the code I put in does not seem to work, because when I press the button it turns white and does not change back to its original color nor green.



So to wrap it up, everything in my app works and the app is 100% serving its purpose and its use. Everything works except the color changing (code on top).

What would or could you change if you started over?

Explain in detail what part(s) of the design and coding you would change or modify.

If I were to redo my whole app, I would change the idea of the app. So the goal of my app is to educate students and to help them. I decided to do it with an alarm because I thought that it is a good way to make a person do mental math in their worst moment.

If I were to redo my whole app, I would choose to do a quiz for different subjects (Math, Physics, Chemistry) this app would have quiz cards or Math questions but with more variety; like algebra, trigonometry, multiplication, powers, division, subtraction, and addition. The design will consist of the main page that will have a similar design of the ___ app but it will have options for you to study. This app will have the goal of organizing and educating the student.

The main page includes a calendar and the current letter day (I will take that from the ___ app) and then the user would have four options to study. As said previously they would be Math, Physics, and Chemistry. Within these four options, there would be different subjects. In math, there would be algebra, trigonometry, multiplication, powers, division, subtraction, and addition. In Chemistry, there would be bonding, atoms, particles, electronegativity, etc. In physics, there would be questions about forces, acceleration, velocity, etc. I would also add time to each question. I would do this so the person would not have the chance to research for the answer or just stay on it forever and ever (remember these questions are supposed to be mental and fast). On the other hand, I would put more time for a person to solve an

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electronegativity question than an addition question. I would also have a feature where you could write an email to a teacher if you had any questions.