2023 SS12 Code for a Cause - CSUN Accessibility Competition
January 20-22, 2023

Problem Statement:

Create a mobile application to help people who need to take eye drop medications stay on track with the prescribed drop schedule. Patients often need to take drops to preserve their eyesight, but they often get confused about the schedule or forget to take them as prescribed. For your reference, there is an existing mobile app called Eyedrop Alarm that is a good starting point. This app has an existing database that can be used to populate the drops for the app you create. The goal is to create a better version of the app with additional features to improve patient compliance and adherence to the prescribed drop schedule.

Deliverables:

- Compatible with iPhone, iPad, Android phones, Android tablets, (Desktop?)
- Notifications arrive at the correct time that specify drop name, bottle cap color, right/left/both eyes. Notifications need to also be sent to smart watches.
- Users can record that drop was done
  - directly in the notification (ok or snooze). If click "Ok" in notification, box checked off automatically.
  - or by clicking on notification and being taken to pop-up in the app. If click "Ok", the box is checked off automatically. This pop-up needs to stay visible until the user makes a selection.
  - or in the app by checking off box, and then notification gets cleared automatically. If the user puts in a drop ahead of schedule and checks off the box, that specific notification should be canceled (after a confirmation popup).
- Badge app icon (like email apps) with number of pending/uncleared alerts
- Notifications still delivered if app closed and/or cleared from background by user
- If travel to new time zone, alarm times work on local time (8 pm stays 8 pm). Same for daylight savings. (Currently, only Android version works this way)
- Option to snooze an alert
- Better sounds with more variety. Some longer. Some louder (to help older patients). Need a simple way for the user to adjust the volume of alert sound. If the device is put on silent, the device should only vibrate. Have the option to have sound and vibration for each alert. Also, need a silent mode (no sound or vibration).
- View past history of drop schedule. Provide compliance data (i.e., put in drop 'z' 90% of time over past x weeks, 100% of drop 'y' over past x weeks, etc.). Maybe add a button in settings for user to open the past schedules and view compliance data.
- The option for users to change alarm times for specific days of the week (i.e., later in AM on Saturdays). Currently, the user edits alarm times using the My Drops screen. Maybe change this to the schedule screen (might need a small icon to let the user know that

this is the place to edit alarm times). If user changes a specific alarm, maybe have pop-up asking if user wants to
  - change time for this one time (just today) <u>or</u>
  - every day going forward (Mon -Sun) <u>or</u>
  - every day on the specific day (i.e., every Saturday)
  - Note: keep using My Drops screen to edit other parameters. If user makes changes, have pop up confirming that user wants to save changes and that this reset all alarm times back to default times.
- Graphics and text on how to put in eyedrops vs. Button that goes to website - https://www.eyedropalarm.com/how-to-put-in-eyedrops.html
- Help button goes to relevant section on eyedropalarm.com website - https://www.eyedropalarm.com/android-help.html or https://www.eyedropalarm.com/iphone-help.html
- **Accessibility features for other target audiences (blind, deaf, etc.)**
- **A security-minded implementation of the front and back end.**

Nice to have ideas:
- Enable "Dark Mode" so app matches user's general phone setting of light or dark mode
- Option to download historical data from app (.csv file?)
- Rewards/encouragement notifications. For example, "Good job, you put in all your drops this past week."
- Support for other languages
- Enable accessibility functions (larger font)
- Option to add Bluetooth device in future that connects to medication bottle to automatically tell the app that the drop was administered

Details:

- Default alarm times for each number of times/day.
  - 1 time/day - 8 pm
  - 2 times/day - 8 am, 8 pm
  - 3 time/day - 8 am, 2 pm, 8 pm
  - 4 times/day - 8 am, 1230 pm, 5 pm, 930 pm
  - 5 - 8 am, 11 am, 2 pm, 5 pm, 8 pm
  - 6 - 8 am, 1030 am, 100 pm, 330 pm, 6 pm, 830 pm.
  - 7 - 8 am, 10 am, 12 pm, 2 pm, 4 pm, 6 pm, 8 pm
  - 8 - 8 am, 10 am, 12 pm, 2 pm, 4 pm, 6 pm, 8 pm, 10 pm
  - 9 - 8 am, 930 am, 11 am, 1230 pm, 2 pm, 330 pm, 5 pm, 630 pm, 8 pm
  - 10 - 8 am, 930 am, 11 am, 1230 pm, 2 pm, 330 pm, 5 pm, 630 pm, 8 pm, 930 pm
  - 11 - 8 am, 9 am, 10 am, 11 am, 12 pm, 1 pm, 2 pm, 3 pm, 4 pm, 5 pm, 6 pm
  - 12 - 8 am, 9 am, 10 am, 11 am, 12 pm, 1 pm, 2 pm, 3 pm, 4 pm, 5 pm, 6 pm, 7 pm
  - 13 - 8 am, 9 am, 10 am, 11 am, 12 pm, 1 pm, 2 pm, 3 pm, 4 pm, 5 pm, 6 pm, 7 pm, 8 pm

- 14 -8 am, 9 am, 10 am, 11 am, 12 pm, 1 pm, 2 pm, 3 pm, 4 pm, 5 pm, 6 pm, 7 pm, 8 pm, 9 pm
- 15 - 8 am, 9 am, …., 9 pm, 10 pm
- 16 - 8 am, 9 am, …., 9 pm, 10 pm, 11 pm
- 17 - 7 am, 8 am, 9 am,.9 pm, 10 pm, 11 pm
- 18 - 6 am, 7 am, 8 am,.9 pm, 10 pm, 11 pm
- 19 - 12 am, 6 am, 7 am, 8 am, ….9 pm, 10 pm, 11 pm
- 20 - 12 am, 1 am, 6 am, 7am, 8 am, ...9 pm, 10 pm, 11 pm
- 21 - 12 am, 1 am, 5 am, 6 am, 7 am, 8 am….9 pm, 10 pm, 11 pm
- 22 - 12 am, 1 am, 2 am, 5 am, 6 am, ...9 pm, 10 pm, 11 pm
- 23 - 12 am, 1 am, 2 am, 3 am, 5 am, 6 am,.9pm, 10 pm, 11 pm
- 24 - 12 am, 1 am, 2 am, 3 am…….11pm

- Number of days scroll options (default is in database for each drop, manual entry default should be "ongoing")
  - Starts with "Ongoing"
  - 1-90 days
  - Ends with "Ongoing"
- End date disappears in MyDrops screen for ongoing drops
- Start date can be in future or in past
- Notification alert has color and eye in all capital letters (i.e., atropine BOTH eyes - RED cap)
- When checkbox is checked off, the drop turns from black to light grey
- In the add drops screen, there is a manual entry screen (defaults are white color cap, Eyedrop name in light grey, Both eyes, Today's date, ongoing, 1 time per day, No taper)
- Alerts still need to come if app killed by user or if phone turned off in between. Or if alert is snoozed and then user kills app or phone is restarted.
- After app is installed, keep current welcome screen when app first opened
- Drops are edited or deleted using the MyDrops screen.
- There is a confirm delete warning popup box
- Duplicate drop warning in add eyedrops screen (Duplicate drop already scheduled)
- Thin black outline around drop bottle icon so can still see it if cap color white (since app's background is white)
- Drop name text size shrinks to fit.   If very long, text gets smaller and then shows "…." since entire name cannot fit
- Search in add drops screen. Smartly lists only drops with that first letter. For example, if type "A" in search box, only drops that start with A are displayed.
- When reopens app, app remembers where left off. If app cleared/killed, when app reopens, it should go to schedule screen. (Schedule screen is the home screen)
- In android version - notifications go to notification center even if app open in foreground. Duplicate this in iOS version.
- For "Gap Between Drops Scheduled For Same Time". Need option of zero minutes in case the user wants no gap.
- Keep end date as the last day of the drops
- The current version only has checkboxes for today's schedule. Consider showing them for today and tomorrow.

- Settings: when trying to select a sound, user needs to hear a sample of the sound as they scroll through the options so they know what each will sound like
- Settings: default "Snooze duration?" should be 30 min
- Settings: default for "Gap Between Drop Scheduled For Same Time" should be 5 min
- When edit a drop and change a single alarm time and then press save, the checkboxes that were previously checked should stay checked.

Tapering drops (reduce number of times per day every X Day)
- Tapered (in italics) displayed in My Drops screen when a drop is on a tapered schedule
- If user selects taper so it will end before the number of days, end date displayed should be the actual end date (tapered date)
- If user selects taper, but number of days is shorter than the taper, end date should be by the number of days not when taper ends
- In general, if there is a conflict between the number of days and when drops go to zero on the taper schedule, the end date should be whatever is soonest/first.
- In add/edit drops screen, if user selects "0 drops" under taper drops? then screen displays "None"
- If a user is editing a standard, non-tapered drop, and decides to start tapering that particular drop, then when the user changes "taper drops?" to something besides "None", then the start date automatically changes to today's date on the screen. If the user goes back to "None", then the start date changes back to the original value.
  - This should only happen when a user underlines{edits} a current drop. Not when the user is adding a new drop.
- If a drop is currently on a tapered schedule and the taper has started (i.e., reduced from 4 times/day to 3 times/day), and the user wants to edit the drop (from the Mydrops screen), the start displayed is the date the most recent reduction in # of drops occurred. The number of times per day is displayed for today and the alarms displayed are for today. The user can change a specific alarm time from this screen. They can also change the start date. But if the user changes "Number of days?", "How often?", and/or "Taper drops?" (# drops by every X Day), then the start date automatically changes to today's date. (Explained in more detail below)
- When editing a drop that is set to taper, but has not started tapering yet (i.e., still at initial number of times/day), start date should not change to today's date if the user changes "Number of days?", "How often?", and/or "Taper drops?" (# drops by every X Day).
- My Drops scream: number of times per day displayed matches what is happening for today in schedule screen (changes as drop gets **tapered**)
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  Tapering logic (android version, need to copy this into iOS version):
  Use this as a reference/example for discussion below:
  Drop 4 times per day starting October 1, taper by 1 drop every 2 days
  1 Oct - edit screen displays 10/1 start date, 4 drops/day, # of days = 8

2 Oct - edit screen displays 10/1 start date, 4 drops/day, # of days = 8
3 Oct - edit screen displays 10/3 start date, 3 drops/day, # of days = 6
4 Oct - edit screen displays 10/3 start date, 3 drops/day, # of days = 6
5 Oct - edit screen displays 10/5 start date, 3 drops/day, # of days = 4
6 Oct - edit screen displays 10/5 start date, 3 drops/day, # of days = 4
7 Oct - edit screen displays 10/7 start date, 3 drops/day, # of days = 2
8 Oct - edit screen displays 10/7 start date, 3 drops/day, # of days = 2

- If user puts 8 days as number of days, last day of drops in schedule screen is 8 Oct and My Drops screen should show end date 10/8.
- If user puts in 14 days as number of days, last day of drops in schedule screen should be 8 Oct and My Drops screen should show end date 10/8 (same result for any value greater than 8 for number of days).
- If user puts 3 days as number of days, last day of drops in schedule screen should be 3 Oct and My Drops screen should show end date 10/3 (same result for any value less than 8 for number of days)
- For editing, if user tries to edit drop on 1 Oct or 2 Oct, edit screen should look almost same as for non-tapered drop, but it should still show "taper by x drops every x days".
- Once taper starts (drop/day gets reduced) on 3 Oct, then edit screen needs to work differently.
  - On 3 Oct, edit screen displays the start date as 3 Oct
  - On 4 Oct, edit screen displays the start date of 3 Oct because it is based on the most recent prior taper on 3 Oct from 4 drops/day to 3 drops/day). Similarly, on 5 Oct and 6 Oct, edit screen should display the start date of 5 Oct (when drops taper from 3 drops/day to 2 drops/day).
  - If user changes "Number of days?", "How often?", and/or "Taper drops?" (# drops by every X Day) in the edit screen, then the start date should change to today's date