

Individual Design Folio URL

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Evidence of inspiration and bibliography of existing apps

Calm Sleep, Sleep Cycle, Sleep Monitor, Twilight, Calm, Sleep Town, Sleep Theory, Sleep Tracker, Sleepzy, Simple Sleep Tracker.

Initial groupwork competitor analysis involved an interrogation of the following four apps:

Calm Sleep

Sleep Cycle

Sleep Monitor

Twilight

I really liked the deep blues and landscape backgrounds of calm sleep – this greatly influenced my idea for the visual appeal of the app. I also realised how much content was locked behind paywalls for data driven apps, and how little they assisted the user in interpreting said data. Specifically Calm Sleep and Sleep Cycle. This instilled in me a need to design a layout that felt intuitive and not daunting to a new user. The app will be very reliant on continuous long-term use and as such, first impressions are vitally important.

Following comments that our group could do more for SWOT, and the specification requiring a bibliography of consulted apps, I decided to download a list of apps and briefly try each one out. I entered each app as a first-time user and made notes on the experience

– design choices I liked or disliked, monetisation practices, tracking and other features that I thought could prove useful.

Calm had a very lengthy set up process. It asked if I'd like to enter some questions to help improve the experience, then immediately required me to sign up. Clicking the cross to skip these stages then prompted me to note where I learnt about the app from, before then saying that the app was 7 days free and nearly £30 a year after. Visual design was like calm sleep, but far more visually diverse. This is not necessarily a good thing for a sleep app, as part of the reason looking at screens late at night is bad is the fact that the diverse range of colours and information causes the brain to stay "awake" decoding and processing it.

Sleep Town: Interesting approach to keeping a schedule, first time login has a brief 4 slide slideshow saying to challenge yourself to maintain a consistent sleep schedule, then introducing the game system by stating that maintaining healthy sleep constructs buildings – with consecutive goal completion providing extra rewards. If you use your phone during sleep time, or wake up too late, the building being constructed will fail. This incentivises users to sleep without their phone to construct the self-titled "Sleep Town". App asks if the user would like a notification or not to help remind them to sleep. First time users are offered a basic tutorial which opens another slideshow. App does not automatically track sleep and waking up – leaving the app breaks the system and if you forget to click the "wake up" button 10 minutes after waking up, even if you woke up on time, the app counts you as failing. Alternatively the user can shake the phone to fill a meter which wakes the phone up. App appears to be a fun way to gamify sleeping but incentivises users to sleep so that they can take part in the app's game mechanics rather than for their wellbeing.

Sleep Theory – doesn't allow user to set their bedtime past 11pm. Unnecessary artificial limit for late sleepers or those with night shifts. App recommends napping, stating that a healthy sleep schedule includes daytime naps. App has a skip and back option, but the buttons are extremely small. Home screen states that "42,801" people are tracking sleep. This could be helpful in instilling a sense of comradery in the user. Aid section offers a compilation of different methods for sleeping such as music, bedtime stories and exercise – but leaves it up to the user to search through and figure out what they want to use. Journal uses a carousel when it could have used scrolling like the other pages. Journal gives sleep quality as a numerical value, presents trends online or point graphs.

Sleep Tracker – instantly promotes expensive yearly pro version with advertisement pop ups. After closing both, a onetime offer appears with only 5 minutes remaining despite the user not having had a chance to use the app. Unethical business practice. Arriving at the home page, the limited offer remains. Design philosophy is sound with a deep dark blue colour palette. The app also allows you to click different factors such as alcohol, caffeine, ate late, worked out with an option to add more (if you subscribe to the pro version) and start a sleep. This is the most like my original plan for Simply Sleep – a sleep tracker that could also track habits that affect sleep and draw correlations between them to create a better routine. Clicking on another tab startled me as a bright white glaring add with loud music started playing – unacceptable for an app that is supposed to help sleep and is once again promoting a pro version despite the user not having a chance to test the app. Records

tab seems very useful and interesting. Gives a sleep score compared against other global users, shows the amount of light and deep sleep, offers methods to improve sleep and even tracks noises made during sleep – something that could be very useful if the user has underlying health conditions. Lastly it allows the user to note how many times you had a drink, dreamed, or went to the bathroom. Despite the unethical monetisation practices, this app had the most interesting range of features.

Sleepzy – Microphone analyses sleep cycles. Another instance of pro monetisation being offered to first time users. Deep blue background and overall colour palette. Home page is simply an alarm, not unlike the one a phone already has. App records sleep phases on a graph using yellow, green, and blue to differentiate the phases. The “trend” tab describes sleep quality, time asleep, sleep debt, when the user went to bed, what time they woke up and what their phases were. The trends are a list of graphs which hold little meaning to a user who wants the app to help them sleep better. Sleepzy is feature lite when compared to the likes of Sleep Tracker – which offers everything Sleepzy has and more. The layout is simple, but the lack of readable data leaves the user to fend for themselves when it comes to improving their sleep.

Simple Sleep Tracker – first time user is told to press the button below to begin tracking. The button in question is a tiny non-descript white arrow on a black background at the bottom of the screen. Clicking the arrow starts a timer, clicking the arrow again (turns into a red stop square) stops the timer. The app is exactly what it says it is – a simple sleep tracker. All it does is add 1 to the number of sleeps whenever you click start and stop. The app manages to be colourful, though unremarkable. Data is listed as a line of numbers, which greatly reduces readability. Combined with the past sleeps merely forming a long scrolling list, the Simple Sleep Tracker is impractical as a genuinely useful sleep tracker.

Design ideas (graphs, buttons, layouts).

Concept development documentation.

Before I began researching mobile app and UX design, I knew that I wanted to keep the number of pages and buttons to a minimum and allow the user to decide how much or how little they want to interact with the app. I also wanted to offer options to automatically track certain elements such as time spent sleeping, exercise, mood (face capture).

I also realised early on that I would have to focus on either factors that are controllable by the user – such as caffeine intake, the amount of exercise they do, or the more challenging factors such as mental health. I decided to focus on the habits as they are much more easily controllable and will allow the user to gain a sense of achievement through using the app. Furthermore, this would bypass the need to test the prototype with participants who have such mental health conditions as there is no time to fill out the ethical documentation required for that undertaking.

Factors such as insomnia, pains etc likely will not be solved by the app and as such, including them would only make the user feel worse about not being able to control factors outside of their control.

The app should focus on things that are entirely manageable by the user.

As an addendum, as someone who uses blue light filter glasses when looking at screens, I was intrigued by the fact that so many sleep apps appeared to use blue in their design. As such I performed a brief study into why this might be the case, and attempted to understand how great a factor blue light actually is in relation to poor sleep. I have attached this at the end of the design folio as it is somewhat lengthy and was written and researched in part for the app, but also out of personal interest.

Source 1

Babich, N. March 2016. Perfect Menu for Mobile Apps. Available from:

<https://uxplanet.org/perfect-menu-for-mobile-apps-39b2cb5b7377>

Keep menus large enough for index fingers – 1.6cm to 2cm for most adults “This converts to 45-57 pixels”. Make menus more visible; burger menu hides navigation behind a click – “usability testing shows that exposing menu options in a more visible way increases engagement”. Utilise space at the bottom of the phone screen to splay out a menu.

Source 2

Mobile in context: design principles of flow and navigation. Available from:

<https://www.youtube.com/watch?app=desktop&v=OZRczPw1BBw&feature=youtu.be>

Allow users to browse content before asking for personal information – my app design allows users to skip login and later create a local account or register with email.

Use a label AND text to keep navigation as clear as possible.

“Young people are more used to holding their phone in one hand” and as such use bottom navigation easily. My app is aimed towards students (“young people”).

Nested navigation is useful for the settings options as these are infrequently used.

Floating icons are useful for important features.

Gesture should be used for “related” content.

Keep promotions unintrusive.

Ask for permission in context – provide reasoning for why you should allow permissions. My beginning slideshow explains that permissions are for automated tracking and allows the user to change them in-app later.

Create “calls-to-action” – home page “add habits” option takes user straight to the habit section.

Organise labels to be user friendly – menu labels are displayed in order of intended use; home page -> routine -> habits -> data -> options/settings.

Source 3

Bufe, A. September 2020. Mobile UX Design: The Complete Expert Guide 2021. Available from: <https://uxcam.com/blog/mobile-ux/>

“some users don’t trust mobile apps” and feel “insecure to give all their private data to a mobile app”. My app allows for users to register and login with a local account, bypassing the need to enter more private information.

If the user has to type, a keyboard must be provided.

Make sure to “use symbols in a common way and not in an unexpected way” – use a house for the home symbol, three dots for settings/options etc.

Source 4

Wroblewski, L. April 2015. Defining Mobile: 4-5.5 Inches, Portrait and One-Thumb. Available from: <https://www.lukew.com/ff/entry.asp?1944>

“94% of the time [phones are] used in portrait orientation”.

The four main smartphone postures listed all feature thumb positions at the middle to bottom of the screen. Keeping navigation and key user inputs at these levels allows for easier and more familiar postures when using the app.

Source 5 & 6

February 2021. Principles of Mobile App Design: A complete Guide to UX Design and Development in 2021. *Mobile App Daily*. Available from: <https://www.mobileappdaily.com/principles-of-mobile-app-designing>

Babich, N. February 2018. A Comprehensive Guide To Mobile App Design. Available from: <https://www.smashingmagazine.com/2018/02/comprehensive-guide-to-mobile-app-design/>

Declutter the mobile app design – add only the elements that are important, be minimalist with mobile app design. If a choice is needed, offer the few most important choices.

Utilise a consistent design across the app – consistency in functionality, visuals – typeface, buttons, and labels.

“Never add inputs that would require users to stretch their fingers to make actions”.

Create an onboarding/ first user experience to show the typical value for the users.

Lo-Fi prototypes (wireframe prototype, static-coloured prototypes).

Remember it is for a phone! Dimensions and appropriate sizing is key.

iPhone X sizing used for prototype. Larger phones should have more “white space” in the upper portions to reduce the need for stretching to reach key features.

Drawn/ sketch wireframe, lo fi and hi fi prototype



User Testing Documentation

First hi-fi prototype feedback:

It looks very much like a wireframe still – no images to draw attention, plain, lack of hierarchy in some of the features.

The typeface hierarchy could be worked on to create a stronger hierarchy of information.

The buttons don't look enough like modern mobile buttons.

Home screen layout is confusing and too text based.

The app could feature more personalized features – such as through the advice section, embrace the AI helper aspect and talk directly to the user.

It might be useful to integrate the advice section into the data tab, so that the user can see the advice as a result of the data produced above.

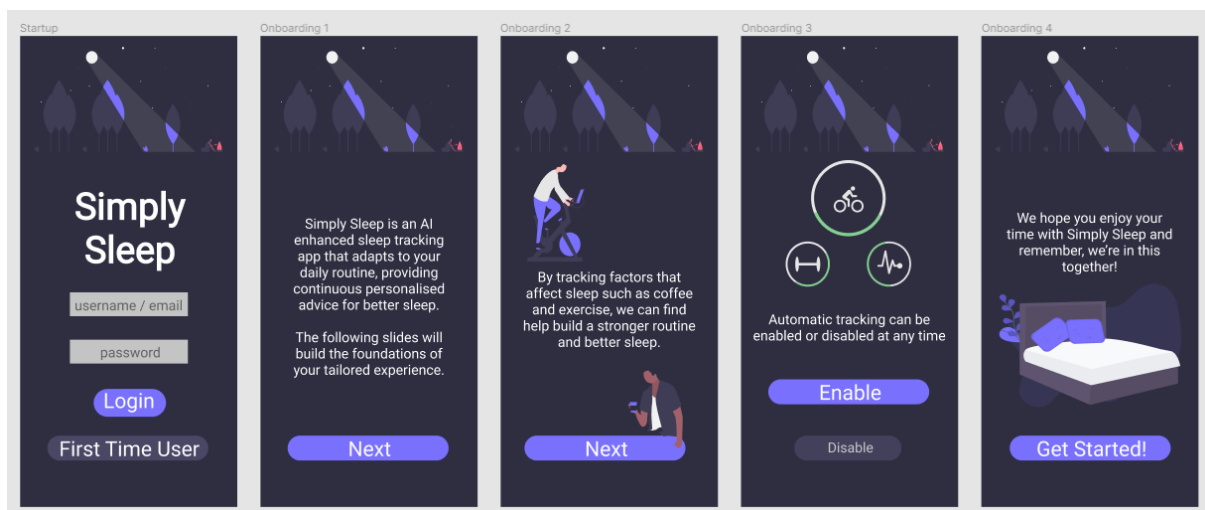
The app feels too text heavy, could do with toning the amount of text down.

Omit just enough things that the user can easily skim the app and choose what to focus on.

Disadvantaged users might struggle to read certain colour based aspects.

Hi Fi prototype

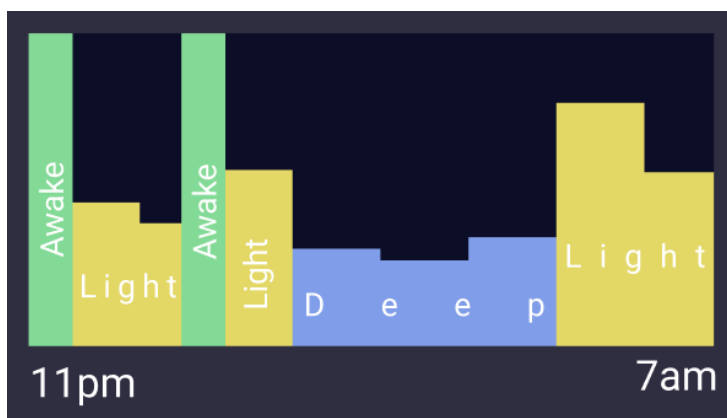
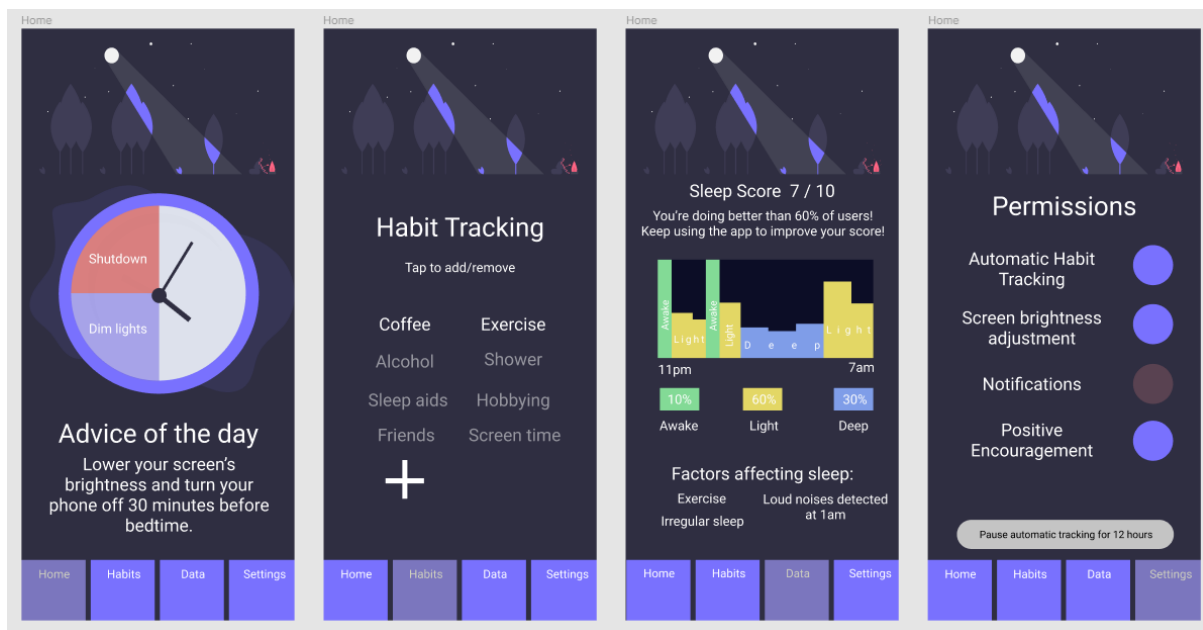
Following advice and feedback, I kept the important features, but overhauled the visual design.



Vector images from:

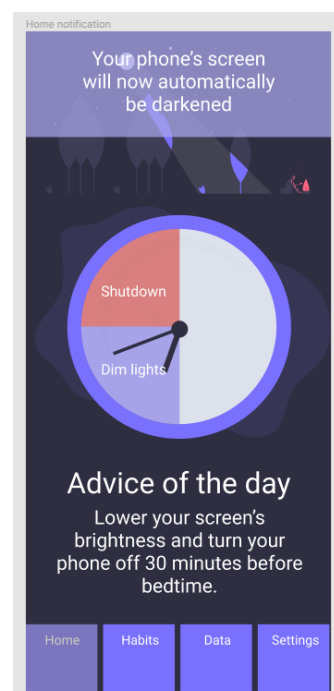
<https://www.freepik.com/vectors/sale> vector created by 3ab2ou - www.freepik.com

<https://undraw.co/search>



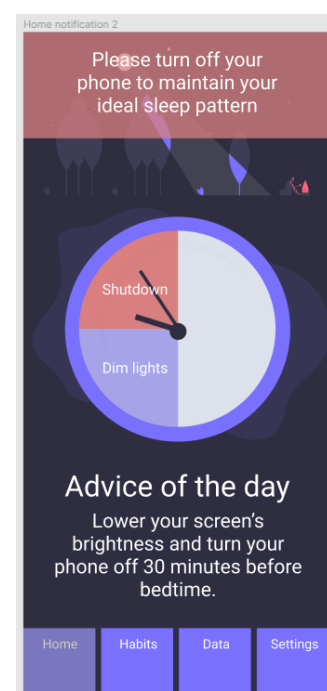
Through user testing I realised that colour blind users might struggle to interpret the graph in the data tab, and clock on the home page. As such, I added contrasting text so that those users wouldn't be disadvantaged.

I also altered my permissions on and off states so that the off state is a lower opacity and a different colour. This makes them more differentiable.



The home screen has been drastically minimised so that only key advice and phone specific factors are listed.

Each day, when the time reaches a specified point, the phone will automatically dim lights and notify the user. Then, later, a second notification will ask the user to turn their phone off to maintain their sleep pattern.



What colours the app should use:

A study concerning which colours promote restfulness and the effect of blue light on sleep.

The Best Colors for Sleep. *National Sleep Foundation*. Accessed 16/03/2021 from:
<https://www.sleep.org/best-colors-for-sleep/>

“So what’s the “magic” color when it comes to bedroom hues? Believe it or not, people whose rooms are painted blue tend to sleep longer than those who get their shuteye in rooms with different colors.”

This is because eyes have specialized receptors in their retina called ganglion cells. They are most sensitive to the colour blue and send information to the part of the brain controlling the body’s 24 hour rhythm. Blue holds connotations with calmness which in turn, when captured by our retina, promote a decrease in blood pressure and heart rate.

“If the color blue isn’t your style, at least try to keep your bedroom wall color in the realm of relaxing shades, like grays, silvers, and neutrals, since these cool colors have also been known to help lower blood pressure and heart rate. Warm colors, like pale yellow, may also work, since they can help create an inviting, cozy feel.”

Cushner, K. Best bedroom colors for sleep. March 15 2018. *Tuck*. Accessed 16/03/2021 from:
<https://www.tuck.com/best-bedroom-colors-sleep/>

“Hands down, the best bedroom color for sleep is blue. Blue is a calming color and calm is conducive to sleep.”

This article also mentions ganglion cells.

“According to a Travelodge survey of 2,000 Britons, those who have blue bedrooms enjoy an average of 7 hours and 52 minutes of sleep each night.”

Other bedroom colours include: Yellow, Green, Silver and Orange.

Worst colours are: Purple, Gray, Brown, Red.

Roberts, M. What’s the best colour lighting for sleep? 17 December 2019. *BBC*. Accessed 16/03/2021 from: <https://www.bbc.co.uk/news/health-50807011>

Blue light from screens is commonly associated with poor sleep, however researchers from Manchester University found that blue light is not the main problem.

Out of yellow and blue lights, both were too stimulating when bright. However, when dimmed, blue light was found to be more restful than yellow light.

Dr Tim Brown drew parallels with the natural world as during the day, lights are white-yellow and stimulating. The later it gets, the bluer the light becomes: "So if you want to avoid light having a strong effect on your body clock, dim and blue would be the way to go."

This means that adjusting the colour of displays to yellows has a more negative affect than dimming blue light.

The problem with this experiment is that the test involved mice – nocturnal animals. The researches stated that light affects all mammals in the same way, so it should still be applicable to humans. They concluded by agreeing more research is necessary.

Ducharme, J. Forget What You Think You Know About Blue Light And Sleep. *Time*. January 10 2020. Accessed 16/03/2021 from: <https://time.com/5752454/blue-light-sleep/>

Second article following the Manchester University research team. Dr Cathy Goldstein argues that since rodents may respond to light differently, we cannot extrapolate data to say that “blue light at night isn’t bad for you”. Goldstein and James Wyatt both state that blue light’s impact has been “blown way out of proportion” and though there is valid scientific evidence for its negative affect on sleep, Wyatt noted that those who read on devices for hours before sleeping took only 10 minutes longer to sleep than those who read paper books.

Further, Goldstein stated that brightness and duration of exposure are just as important as the light spectrum – that is to say, reds and oranges and other warm colours are ineffective sleep remedies if they aren’t also dimmed. Looking at a red or blue screen for hours will both prevent sleep. Personal preference also plays a role in this.

Lastly, Wyatt suggests keeping temperatures to about 65 degrees Fahrenheit (18 degrees Celsius), limiting intermittent noise, sleeping in a dark room and sticking to the same sleep and wake schedule each day to maintain “quality rest”.

Fleming, A. The truth about blue light: does it really cause insomnia and increased risk of cancer? 28 May 2018. *The Guardian*. Accessed 16/03/2021 from: <https://www.theguardian.com/lifeandstyle/2018/may/28/blue-light-led-screens-cancer-insomnia-health-issues>

John O’Hagan from Public Health England’s centre for radiation, chemical and environmental hazards also states that blue light filter worries have been blown out of proportion. “they don’t come anywhere near the international exposure limits even for prolonged viewing, and are only a fraction of what you’d get just walking outdoors on a cloudy day.” Using a laptop is “trivial compared to me walking outside and looking up at the sky – not at the sun, just the sky.”

Yetman, D. Do Some Types of Light Help You Sleep Better? 15 January 2021. *Healthline*. Accessed 16/03/2021 from: <https://www.healthline.com/health/best-color-light-for-sleep>

Co-source:

Shechter, A et al. Blocking nocturnal blue light for insomnia: A randomized controlled trial. January 2018, *J Psychiatr Res*. 2018 Jan; 96: 196-202
<https://www.sciencedirect.com/science/article/abs/pii/S0022395617308592?via%3Dihub>

Researches reviewed studies to find that specialized photoreceptors (which influence the production of the sleep aiding hormone melatonin) are most sensitive to light with wavelengths between 450-480 nanometres. This appears as blue light.

The article results concur with the Manhattan University research team in that studies referring to rodents depreciate the value of experiment results.

There is too little research into the affects of red light to draw a meaningful conclusion.

Brown, H. What Color Light Helps You Sleep the Best? *Bestlightguide*. Accessed 16/03/2021 from: <https://bestlightguide.com/what-color-light-helps-you-sleep/>

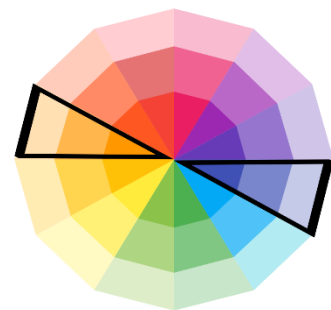
“Out of all colors, blue is the most unfavorable one...There is a specialized pigment in our retina that is sensitive to the wavelength of light...Therefore, it stimulates our brain and promotes alertness.”

On a colour wheel, blue and orangey-yellows are complimentary. Reducing the amount of colours and contrasting colours can help decrease mental stimulation.

Further through Hick-Hyman’s Law, increased options increases response time – an overwhelming amount of colour can delay responses and overstimulate the brain when the UI should allow for a quick and easy rest.

Using the blue and orange/yellow colour theory, the app could match up with the daily light cycle. During the day when light is naturally white-yellow, the app could appear orange/yellow with deep blue text. Then during the evening and night, the colours shift to deep blue and recommend dimming screen lights. Text becomes orange.

This feature could be customised to always be orange and always be blue, or a reverse of the default setting to fit user preference.



In conclusion, blue light is not necessarily the worst colour to look at before sleeping. Blue is a colour that instils a sense of calm and is present in the natural world. As the Earth turns away from the Sun, yellow light is replaced with blue and becomes part of our circadian rhythm. What’s more, researchers found that dim blue lights are much less harmful to sleep than bright white and yellow lights. As such, I will be using dark blue colours for my app’s main theme, with pastel contrasting greens and yellows for my graphs. Overall, a dim and colourfully minimalist aesthetic should in theory reduce the amount of activity occurring in the brain before a night of rest.