

Badge 3:

App Development

Apps have replaced our address books, calendars, to-do lists, flashlights, maps, dictionaries, alarm clocks, and a lot of other things. These powerful little programs on our phones or tablets can also help us change our lives.

Learn how apps collect data and can help people develop healthier habits.

Steps

1. Learn about data collection and visualization
2. Write an array to store personal data
3. Create a personal data collection plan
4. Learn how to correlate data
5. Develop a prototype for a habit-tracking app

Purpose

When I've earned this badge, I'll know how to store data with arrays and how to collect and analyze data for personal improvement. I'll have created my own prototype for an app that will help to build a healthy habit.

STEP

1 Learn about data collection and visualization

Apps can collect lots of information, or data, for you—like how many steps you took or where you walked on a hike. They also collect data about you—like where you’ve been or what websites you’ve been looking at.

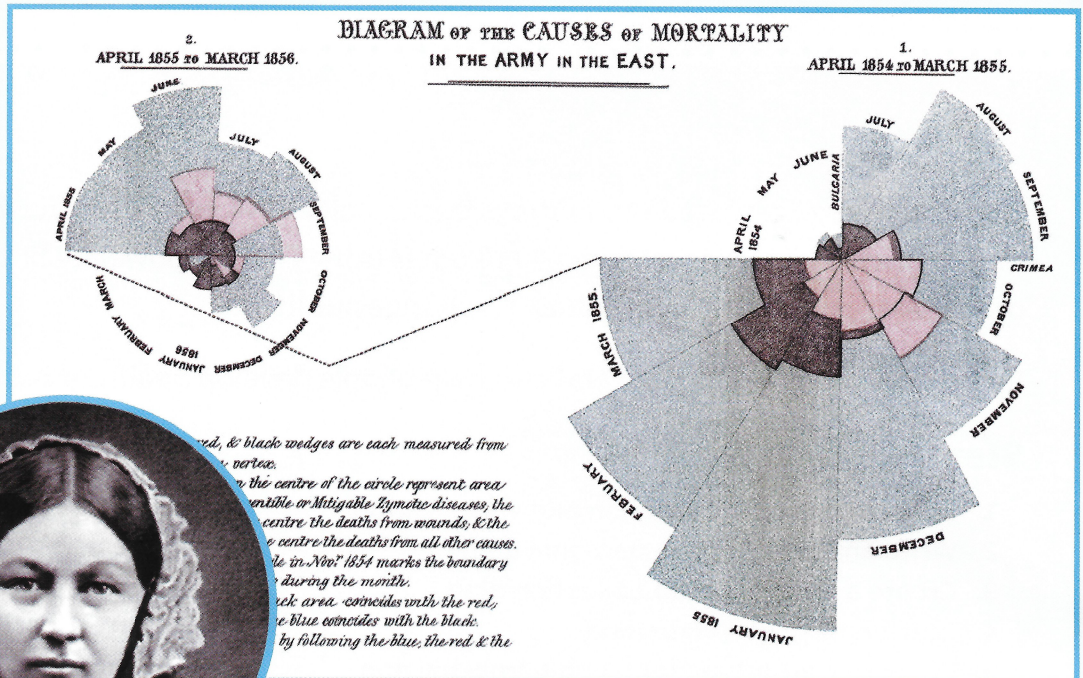
Computer programmers write the code that lets apps, games, and websites collect data. In a tracking app, a designer shows you data about the thing you’re tracking in a way that’s clear and easy to understand. That process—putting data in an easy to understand visual format—is called **data visualization**: think different kinds of charts, diagrams, or infographics. The type of chart or diagram you choose to show your data will depend on the type of data you gather and what you’re trying to show people.

Saving Lives with Data!

Florence Nightingale was a nurse in the 1850s during the Crimean War. During the war, she collected data over two years at a military hospital showing the causes of death. To help people understand all the information she had collected, she created a data visualization.



Florence Nightingale



She used a polar area diagram (now it’s also known as a Nightingale rose diagram) to show a breakdown of the different causes of death. A polar area diagram is like a pie chart, but instead of the slices of pie being wide or narrow, they’re all the same width, but extend out from the center more if there’s more data.

Because of her research using data and statistics, Ms. Nightingale was able to revolutionize sanitation practices in nursing.

WORDS TO KNOW

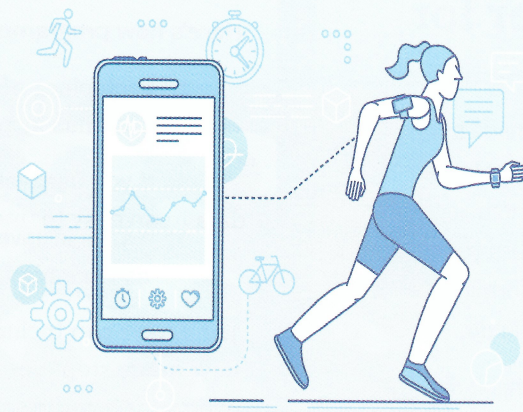
App stands for application, used by computer programmers to refer to self-contained software that a user interacts with on different devices. Apps can be used for different purposes like organizing information (such as calendars or to-do lists), providing a service (such as showing a map or tracking the number of steps you walk each day), or providing entertainment (such as playing a game or a video).

Bar chart a graphical way to display data using bars of different heights. The type of bar chart you'll be creating is a histogram, where each bar groups numbers into ranges and taller bars show that more data fall in that range.

Data any set of facts or statistics collected and analyzed or used for reference. Data can be in many forms and include information like steps taken, photos shared, or emails and messages sent. It can also include information collected from a cell phone or other device, such as the location history, internet browsing history, login names, and passwords.

Data visualization a way data scientists, computer programmers, designers, and others communicate information clearly and efficiently. Data visualization uses statistical graphics, plots, information graphics, and other tools. Effective visualization helps users analyze and think about data. It makes complex data more accessible, understandable, and usable.

Health/Habit-tracking apps self-contained software that helps people develop healthy habits. Users can set fitness goals and track nutrition, exercise, sleep, or even moods. They can also share progress on social media to encourage healthy behavior changes.



Pitch a business presentation seeking support from people to invest in or buy a new product. It can be an email, letter, or even a conversation. Sometimes a presentation is called a “sales pitch,” because it’s more like a commercial. The goal is to get a user to buy a product.

Prototype a first version of a product which is built to be tested so that changes can be made before production.

Scatter plot data visualization that shows the relationship between two variables in a set of data. For example, one variable could be “mood,” and another, “screen time.” By plotting the mood data on one axis, and screen time on another, a scatter plot can show the relationship between an individual’s screen time and emotional state.

User interface the visual elements of a program through which a user controls or communicates with an application. Often abbreviated UI.

Apps are Healthier for YOU

Have you ever made a New Year's resolution? Maybe you wanted to eat more veggies or remember to floss your teeth but found that forming the new habit was hard to do.

Forming a new habit also takes a long time. Some researchers have found that it can take up to two or more months to form a habit!

Lots of apps have been created to help people lead healthier lives. Apps can help you meditate, schedule your time effectively, track your mood, get a good night's sleep, get more exercise, or eat in a more healthful way.

Having these kinds of apps makes it easier to build healthy habits into your everyday life.

STEP 2 Write an array to store personal data

Programmers code arrays to make digital images on screens.

They also use arrays to store other kinds of data, like lists of words or dates.

Here's how programmer write arrays:

- Each piece of data is called an **element**, and elements are separated by commas in a Javascript array.
- If you use words, you have to put them in quotation marks.
- Arrays in JavaScript start with "var" because JavaScript thinks of arrays as **variables**.

The arrays can include personal data like how many hours you sleep at night, how many steps you take every day, how many glasses of water your drink, or even your favorite shoes!

Here's how a programmer would write an array listing her shoes:

```
var myShoes = ["sneakers", "black flats", "sandals",  
"snow boots", "dance shoes", ...]
```

Now you give it a try! Write an array listing your shoes.



STEP 3 Create a personal data collection plan

One way to change or create a new habit is to keep track of what you're doing now. From that, you can figure out what and how to improve.

The data you collect before you start to work on your new habit let you know where you are (that's called a baseline) and help you decide on your goal.

Healthy habit apps make it easy to collect your data. Once you've collected data, you can set a goal and work towards it. That data could be hours slept, steps taken, glasses of water consumed—things measured in numbers. It could also be how you're feeling or where you've been. Information is power. An app's ability to collect data lets you harness the power of your personal data!

FOR YOUR EYES ONLY



Our phone is a super computer. It gathers data about you all day long.

For example, your computer collects data about:

- where you are
- who you're talking to or texting
- what photos you take and save on your devices
- what websites you visit and what apps you download
- what stores you shop at
- what music you listen to

What do you think happens to all that information? When you download an app, it might ask for access to some of that data. If you agree, the business that created the app might package your data and sell all of the users' collected data to other businesses for market research, targeted advertising, and more.

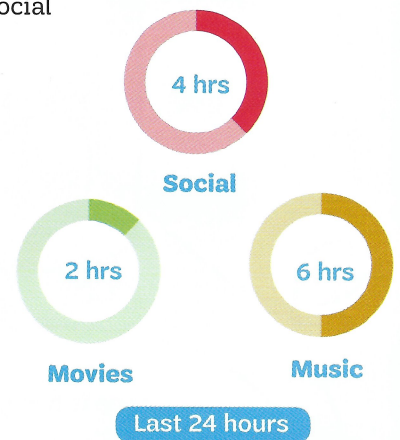
Be careful when you download apps, especially free ones. Be sure to review the privacy settings on your new apps. Turn off things like access to your contacts, calendar, photos, and location. Don't allow the app to post to social media for you. Read the privacy policy so you know exactly what's happening to your private data.

STEP

4 Learn how to correlate data

If you have two sets of data, like your mood over a week and what the weather was over the same week, and both of those sets of data change at the same time, that's correlation. So if you love snow, and it snows, you might feel happy. You could say that there's a relationship between snow and your mood. If you tracked the weather and your mood throughout the winter, you could create a data visualization with the two sets of data that would show the correlation.

Apps can make data correlations easier to understand. For example, there are apps that track how you spend time on your device. They collect data about how much time you spend on each type of app (social media, entertainment, etc.), and when you use these apps or sites. The app then will show your data in a visualization, such as a pie chart. You might notice patterns or correlations, like you use Instagram a lot at certain times, or you spend more time on certain apps on the weekend than during the week. By including data visualizations, apps can make it easier for you to see correlations in your personal data.



STEP

5 Develop a prototype for a habit-tracking app

Making a great app is a big challenge for designers. Programmers design apps with particular problems or users in mind. Programs are designed with specific purposes, and different designs are more useful or pleasing to different people.

Designing an app can be challenging for a lot of reasons. One of the biggest challenges is figuring out how to develop an app that will both help the user and the user will like. App developers need to consider what the users will want the app to do, what will make the app fun to use, and how the app will address their users' concerns.

The most successful health or habit tracking apps are easy and fun to use and help people work on a personal issue that's important to them. They collect the necessary data and visualize the data in the app in a way that helps the user improve.

What kind of information would you want from users about what they need in a health or habit-tracking app? How could you gather that information? How can you make using the app fun and easy?

Now that I've earned this badge, I can give service by:

- Interviewing local health professionals like doctors, physical trainers, and nutritionists about their favorite healthy apps and compiling a list to share in my community.
- Conducting a workshop at a senior center or retirement home about how apps work and how users can protect their privacy.
- Hosting a Bring-Your-Own-Device (BYOD) event at school where we show kids how to use the settings on apps to protect their privacy.

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I'm inspired to: