

Prototyping with Framer: Creating a High-Fidelity Learning Platform

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Chapter 1 - Prototyping Tool: Framer

Framer is a prototyping tool that distinguishes itself in the digital design landscape through its unique blend of flexibility, interactivity, and advanced animation capabilities. Designed to cater to a broad spectrum of design requirements, Framer is particularly adept at bridging the gap between graphic design and interaction design, making it an ideal choice for creating both simple wireframes and complex interactive prototypes.

Key Features

- **Advanced Interaction and Animation Tools:** Framer goes beyond basic prototyping by offering advanced interaction and animation capabilities, paving the way for dynamic prototypes that closely mimic the behavior of the final product.
- **Intuitive Visual Design Interface:** Framer's interface is user-friendly, featuring a drag-and-drop system that simplifies the design process.
- **Flexible Layout Options:** Framer offers a variety of layout tools, including Frames, Stacks, and Grids. Frames allow for freeform layouts with absolute positioning. Stacks facilitate controlled layouts similar to CSS Flexbox while Grids mirror the functionality of CSS Grid, perfect for complex, structured designs.
- **Component-based Design System:** Framer's emphasis on components enables designers to build reusable, customizable elements, ensuring consistency across projects.
- **Code Overrides and Components:** Unique to Framer is the ability to use JavaScript code overrides and custom code components. These features allow for the integration of real data and logic into prototypes, offering a level of interactivity and functionality that is very rare in other prototyping tools.
- **Collaboration and Integration:** Framer facilitates team collaboration with shared projects and seamless integration with other tools and workflows.

Best Use Cases for Framer

- **High-Fidelity Prototyping:** Framer shines in scenarios where high-fidelity prototypes are needed to simulate the look, feel, and interactivity of the final product.
- **Interactive and Animated Designs:** Ideal for projects requiring intricate animations and interactive elements, Framer allows designers to explore and test complex user interactions.
- **Responsive Web Design:** With its flexible layout tools, Framer is well-suited for designing responsive web interfaces that adapt seamlessly to various screen sizes.
- **User Experience Testing:** Framer's interactive prototypes are invaluable for user testing, providing realistic experiences for gathering accurate user feedback.

Components

Components in Framer are reusable design elements that can be customized and manipulated to fit various design needs. While Framer offers a degree of freedom in creating custom components, it falls short in providing an extensive library of ready-made components. This gap requires designers to invest more time in creating elements from scratch, though it also fosters creativity and uniqueness in design.

Layout Tools in Framer

- **Frames:** Framer's frames offer freeform layout capabilities with absolute positioning, essential for responsive design. Frames allow designers to pin layers to sides, adapting layouts to different screen sizes.

- **Stacks:** Stacks in Framer mimic CSS Flexbox, providing controlled layouts with relative positioning. They support features like auto-sizing, gaps, and padding, crucial for creating scalable designs.
- **Grid:** The grid system in Framer parallels CSS Grid, enabling designers to create complex layouts with precision. It's particularly useful in organizing content in structured formats like dashboards.

Use of Grid and Stack

The grid layout shines in organizing elements in dashboard designs. The ability to align items both horizontally and vertically facilitates the creation of clean and accessible interfaces. Similarly, stacks are great for designing fluid interfaces that require elements to be aligned in a linear fashion, adapting seamlessly to content changes.

Code Overrides and Code Components

Code overrides and code components are powerful features in Framer that allow designers to incorporate advanced functionality and interactions into their prototypes. Utilizing JavaScript, these features unlock a higher level of customization, enabling designers to implement complex interactions that closely mimic real-world applications. Using code overrides and code components are completely optional, but the functionality makes Framer a very powerful and unique prototyping tool.

Additional Features and Capabilities

The Google Chrome add-on for Framer is a noteworthy feature, allowing designers to import components directly from the web into their Framer projects. This tool enhances the efficiency of the design process, bridging the gap between inspiration and execution.

Conclusion

Framer is a robust prototyping tool that balances ease of use with advanced features. While it excels in offering customizable component and interactive design capabilities, its lack of an extensive pre-built component library can be a drawback for some designers. Nevertheless, Framer's strengths in responsive design, interactive prototyping, and code integration make it a formidable tool in the design and prototyping sphere.

Chapter 2 - Framer Applied: A Gamified Learning Platform

Framer was used to prototype a new learning platform, called Data City (“Learn Data Science While Building Your Own City”). The learning platform combines the intrigue of urban planning and development with the educational journey of mastering data science. The goal is to gamify the platform to offer a more interactive and immersive learning experience, as well as appealing to a wide range of learners who are interested in both city building and data analytics. By gamifying the learning process, it makes complicated topics, such as data science, more accessible, engaging, and fun.

Notes on the Homepage

Screenshot of the Data City homepage:

The top navigation bar includes a logo, the title "Data City: Learn Data Science While Building Your Own City", and links for "Home", "Help", and "Logout".

The main header says "Welcome to your dashboard, UserXYZ!" with a "Refresh" button.

The "City Progress" section shows a green leaf icon and a house icon.

The dashboard is organized into three main categories: Modules, Quizzes, and Challenges.

- Modules:**
 - Module 1: Data Park**: Introduction to Data Science. Status: Completed (green checkmark). Image: A park with trees and a path.
 - Module 2: Residential Analytics**: Data Cleaning and Preprocessing. Status: Completed (green checkmark). Image: A residential street with houses.
 - Module 3: Utility DataWorks**: Data Visualization. Status: In Progress (yellow exclamation mark). Image: Power transmission towers.
- Quizzes:**
 - Quiz 1: Data Park Basics**: Test your understanding of fundamental data science concepts. Status: Completed (green checkmark). Image: People in a park.
 - Quiz 2: Residential Data Clean-Up**: Test your understanding of data cleaning and preprocessing. Status: In Progress (yellow exclamation mark). Image: An aerial view of a residential area with pools.
 - Quiz 3: Utility Visualization**: Gauge your skills in data visualization. Status: Pending (grey question mark). Image: Rows of solar panels.
- Challenges:**
 - Challenge 1: Data Park Collection Challenge**: Collect and analyze basic city data sets, learning the essentials of data gathering and interpretation. Status: Pending (grey question mark). Image: A park with large trees.
 - Challenge 2: Residential Area Data Organizing Challenge**: Tackle data cleaning and preprocessing tasks to maintain order in the city's residential areas, dealing with missing data and noise. Status: Pending (grey question mark). Image: A city skyline.
 - Challenge 3: Utility DataWorks Visualization Project**: Create engaging visualizations of the city's water and electricity data, learning to communicate insights effectively through visual means. Status: Pending (grey question mark). Image: Utility poles and power lines.

Figure 1: Data City Homepage

Using Framer's stack (CSS Flexbox) and grid (CSS Grid), I created the homepage for Data City (a learning platform that combines urban planning with data science) off inspiration from various dashboard-style interfaces I've seen over the years. The homepage assumes the user has already logged in, and they are greeted at the top by their username/name to further reinforce it is their account.

Inspiration

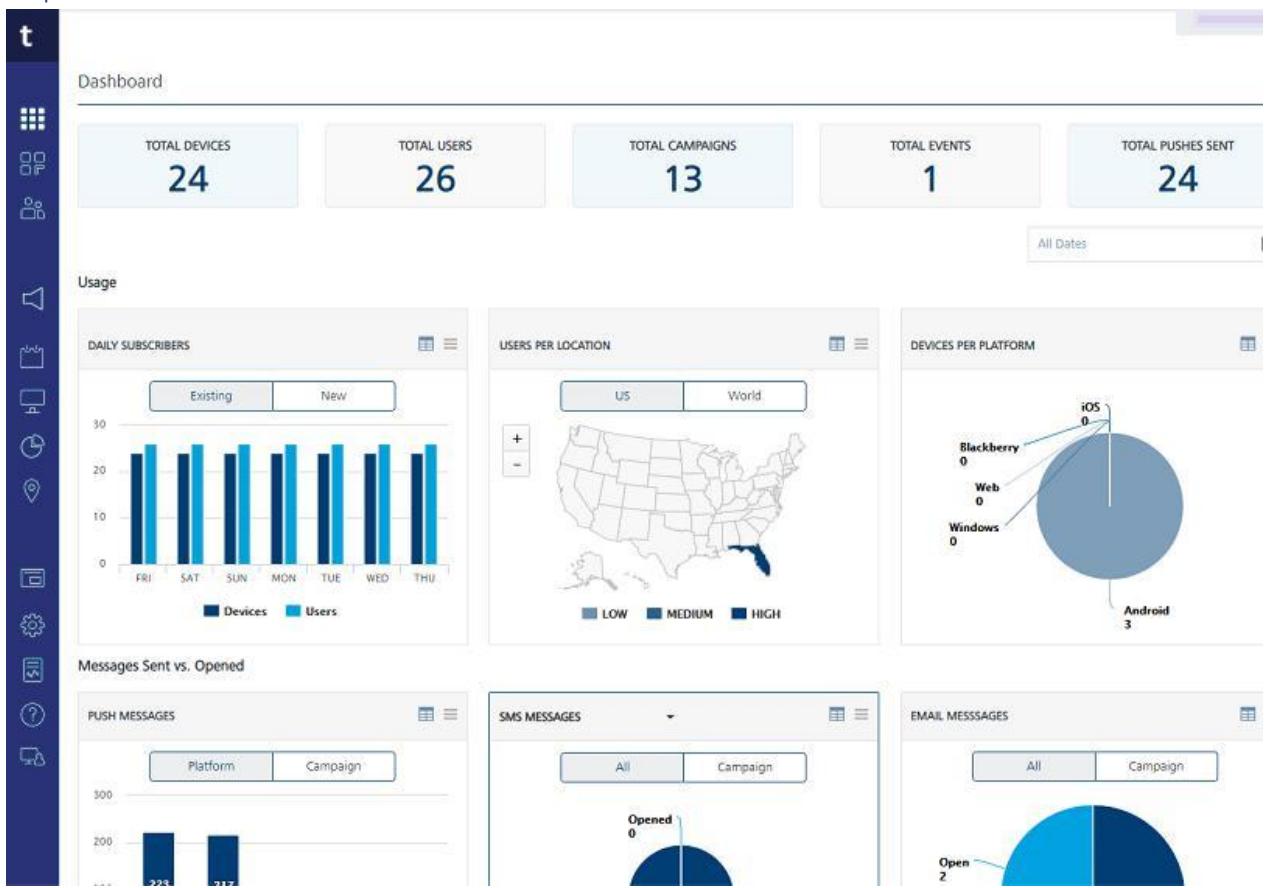


Figure 1: Dashboard in grid format, with different cards representing different functionalities.

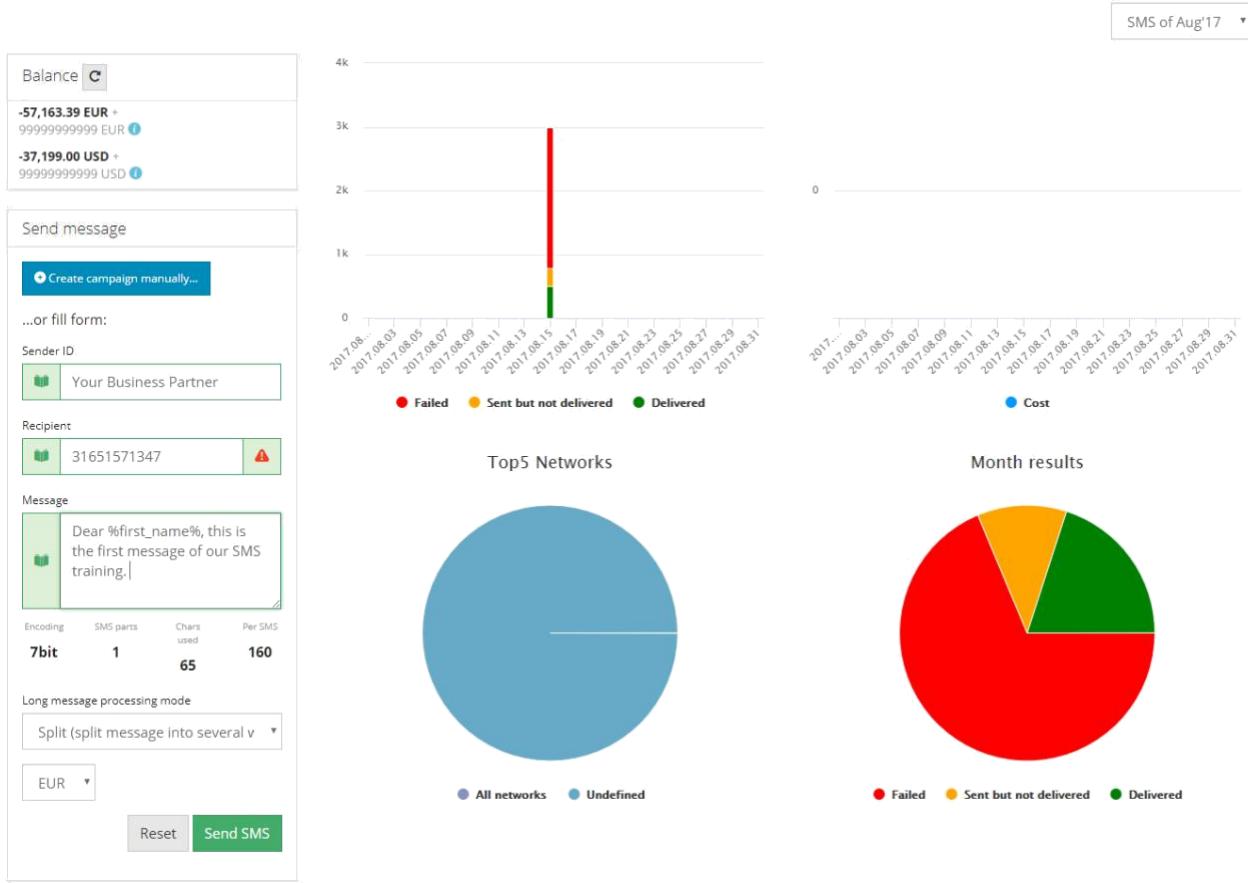


Figure 2: Another example of a dashboard, with different cards showcasing charts and other visualizations, as well as functionalities.

Global Navigation

The top navigation, including logo, platform name, home, help, and sign-out, is static through the whole application. Home, help, and sign-out also change color upon hover/press to communicate to the user they are interactive. However, only the home icon is usable for this specific prototype, due to the others not being needed at this time.

Refresh Action Button

A refresh button is available at the top for the user to refresh their homepage for potential content updates and/or completion checkmark updates to the cards/areas they've completed. The refresh button also changes color upon hover and press to inform the user that it is interactive.

Progress Bar

A progress bar is used to communicate how far along the user is on their learning journey (there are 7 specific sections). Once a user completes a section (module, quiz, and challenge) the progress bar (hypothetically) gains one of the 7 corresponding icons. For example, when the user completed the module, quiz, and challenge for the data park section 1 their progress bar updated with a leaf.

Cards

Framer's grid (CSS Grid) is used in the body of the homepage, with each card representing a module, quiz, or data challenge. The responsive grid is great for a learning platform where more and more content may be added as time goes on. Titles for each of the 3 sections are also sticky, so as the user scrolls down to view all the cards both their progress bar and titles of each section (modules, quizzes, data challenges) scroll along with them.

Task 1: Modules

Framer was used to develop an interactive modules page. Each dropdown is a lesson and the dropdowns are organized in a Framer stack layout. Each dropdown, along with interactions, is contained inside of the component. The component (dropdown) was created separately and then added to the modules page of the prototype. A user can open or close the lesson, as necessary. The user can also click on Lesson 1 and view a slideshow. The overall design structure for this task is responsive, organized, and compact.

Task 1 Prompt

Starting on your homepage, click on Module 3: Utility DataWorks. Click the dropdown arrow for Lesson 1: Types of Visualizations. Scroll down and look through the slideshow of different types of charts. Scroll down further and read the Knowledge Check. Try to spot which definition is wrong and click on it. Scroll to the top and click on Home to go back to your homepage.

Sketching

Data City Task #1

12/11/2023

Global Navigation.

* Homepage uses cards.

* Dashboard appearance.

* User is already logged in.

No more content!

Alternative Idea:

Uses modal windows.

The image contains two hand-drawn wireframe sketches on a notebook page.

Data City Task #1: This sketch shows a dashboard layout. At the top left is a logo with a checkmark and the text "Data City". To its right is a "Progress Bar" with three sections: "Modules", "Quizzes", and "Data Challenge", each represented by a square icon. Below the progress bar is a 3x3 grid of nine empty square icons. At the bottom of the grid is the text "No more content!". In the top right corner of the dashboard area, there is a note "Global Navigation." with a small checkmark icon.

Alternative Idea: This sketch shows a different dashboard layout. It features a header with a logo and a user icon. Below the header, there is a section titled "Module 3" with a "Description" field. Underneath this are four list items labeled "Lesson 1", "Lesson 2", "Lesson 3", and "Lesson 4", each with a checkmark icon. Below these lessons is a large rectangular box containing a left arrow, a central square, and a right arrow. A callout bubble points to this box with the text "Slideshow for displaying content.". To the left of the main dashboard, there is a note "Dropdown menus/ Cards." with a checkmark icon. To the right of the main dashboard, there is a note "Uses modal windows." with a checkmark icon.

Task 1: Step-by-Step Walkthrough

Data City: Learn Data Science While Building Your Own City

Home Help Logout

Welcome to your dashboard, UserXYZ!

C Refresh

City Progress: 🌱 🏠

Modules	Quizzes	Challenges
 Module 1: Data Park  Introduction to Data Science: The foundational elements of data science, including data types, collection, and basic analysis. 	 Quiz 1: Data Park Basics  Test your understanding of fundamental data science concepts. 	 Challenge 1: Data Park Collection Challenge  Collect and analyze basic city data sets, learning the essentials of data gathering and interpretation. 
 Module 2: Residential Analytics  Data Cleaning and Preprocessing: The crucial tasks of data cleaning and preprocessing. 	 Quiz 2: Residential Data Clean-Up  Test your understanding of data cleaning and preprocessing. 	 Challenge 2: Residential Area Data Organizing Challenge  Tackle data cleaning and preprocessing tasks to maintain order in the city's residential areas, dealing with missing data and noise. 
 Module 3: Utility DataWorks  Data Visualization: Learn to transform raw data into compelling visual narratives. 	 Quiz 3: Utility Visualization  Gauge your skills in data visualization. 	 Challenge 3: Utility DataWorks Visualization Project  Create engaging visualizations of the city's water and electricity data, learning to communicate insights effectively through visual means.

Step 1: Starting on the homepage, click on Module 3: Utility DataWorks.



Module 3: Utility DataWorks



Module 3: Utility DataWorks



Data Visualization: Learn to transform raw data into compelling visual narratives.

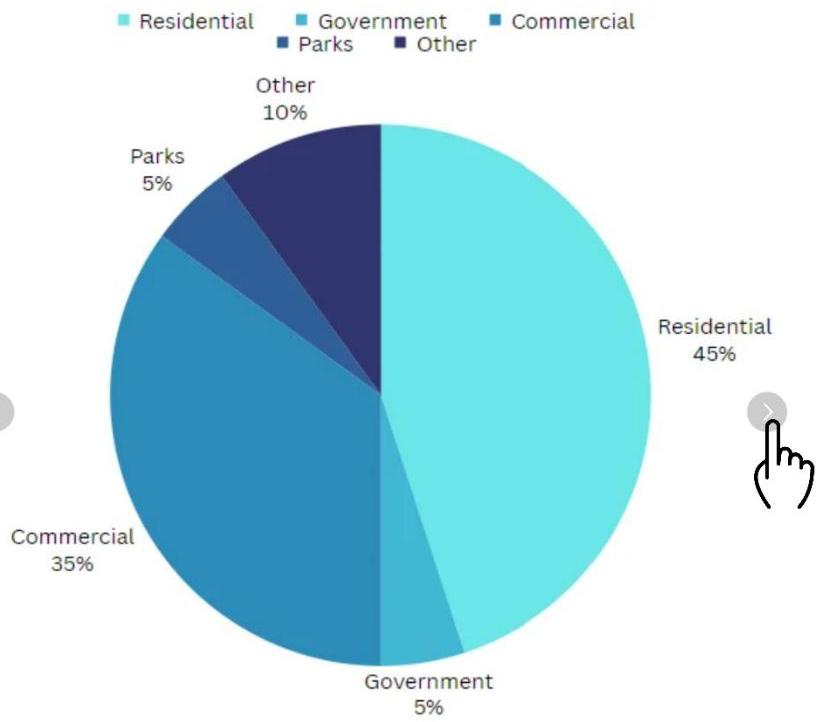
Lesson 1

Types of Visualizations



Step 2: Click on the dropdown for Lesson 1: Types of Visualizations.

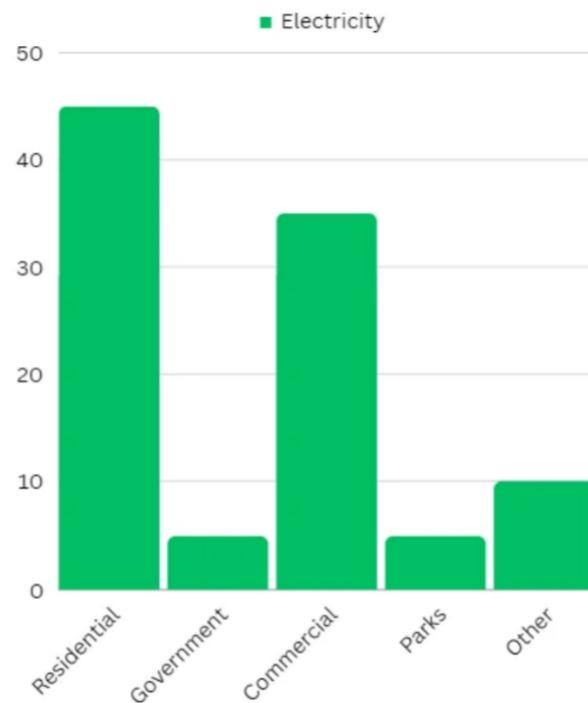
Module 3: Utility DataWorks



Pie Chart - Water Usage

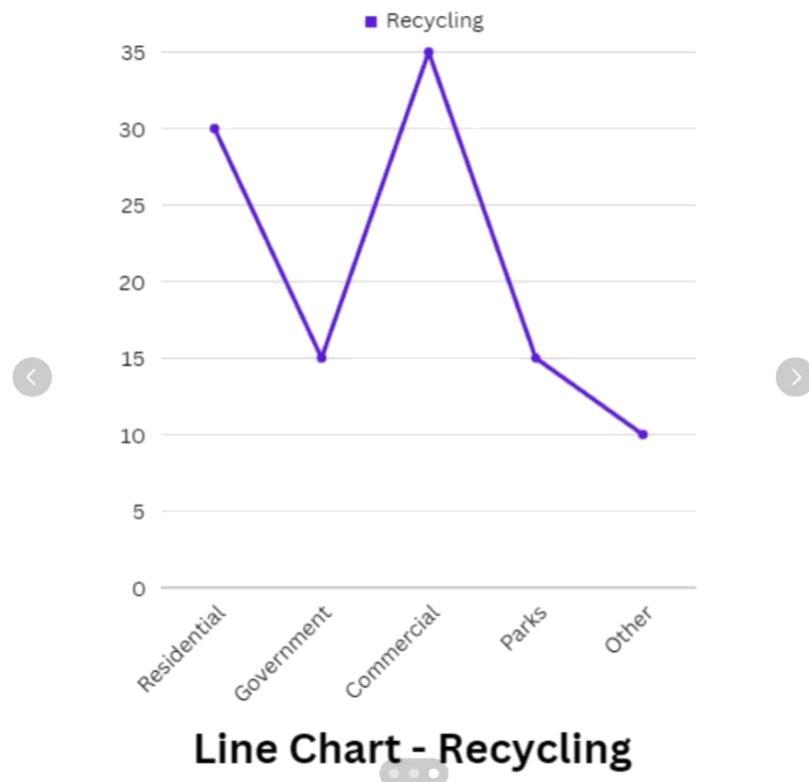
Step 3: Move right through the slideshow of chart types.

Module 3: Utility DataWorks



Step 4: Continue moving through the slideshow of chart types.

Module 3: Utility DataWorks



Step 5: View the last slide in the slideshow. You are welcome to continue viewing the slideshow.

Knowledge Check

Spot the Mistake:

Line Chart: A circular statistical graphic, which is divided into slices to illustrate numerical proportion.



Bar Chart: Presents categorical data with rectangular bars and heights or lengths proportional to the values they represent.

Step 6: Scroll down to view the knowledge check. Click on which one you think is wrong.

Knowledge Check

Spot the Mistake:

Pie Chart:

~~Line Chart~~: A circular statistical graphic that's divided into slices to illustrate numerical proportion.

✓ **Bar Chart:** Presents categorical data with rectangular bars and heights or lengths proportional to the values they represent.

Step 7: Check out whether you clicked on the mistake.

Data City: Learn Data Science While Building Your Own City

Module 3: Utility DataWorks

Module 3: Utility DataWorks

Data Visualization: Learn to transform raw data into compelling visual narratives.

Lesson 1
Types of Visualizations

Recycling

Category	Value
1	30
2	18
3	35
4	15

Step 8: Scroll back up to the top and click on Home/the house icon to return to the homepage.

Design Patterns/Interactive Elements

- **Dropdowns** – A dropdown is used to house lesson 1 (and would be used for all further lessons added), keeping the module page organized and compact.
- **Slideshow** – A slideshow is used to present different types of visualizations. A user can move through the slideshow both forwards and backwards.
- **Cards** – Similar to the homepage, the dropdown lessons are organized in card form to keep different parts of the lesson organized and easy to visually decipher.

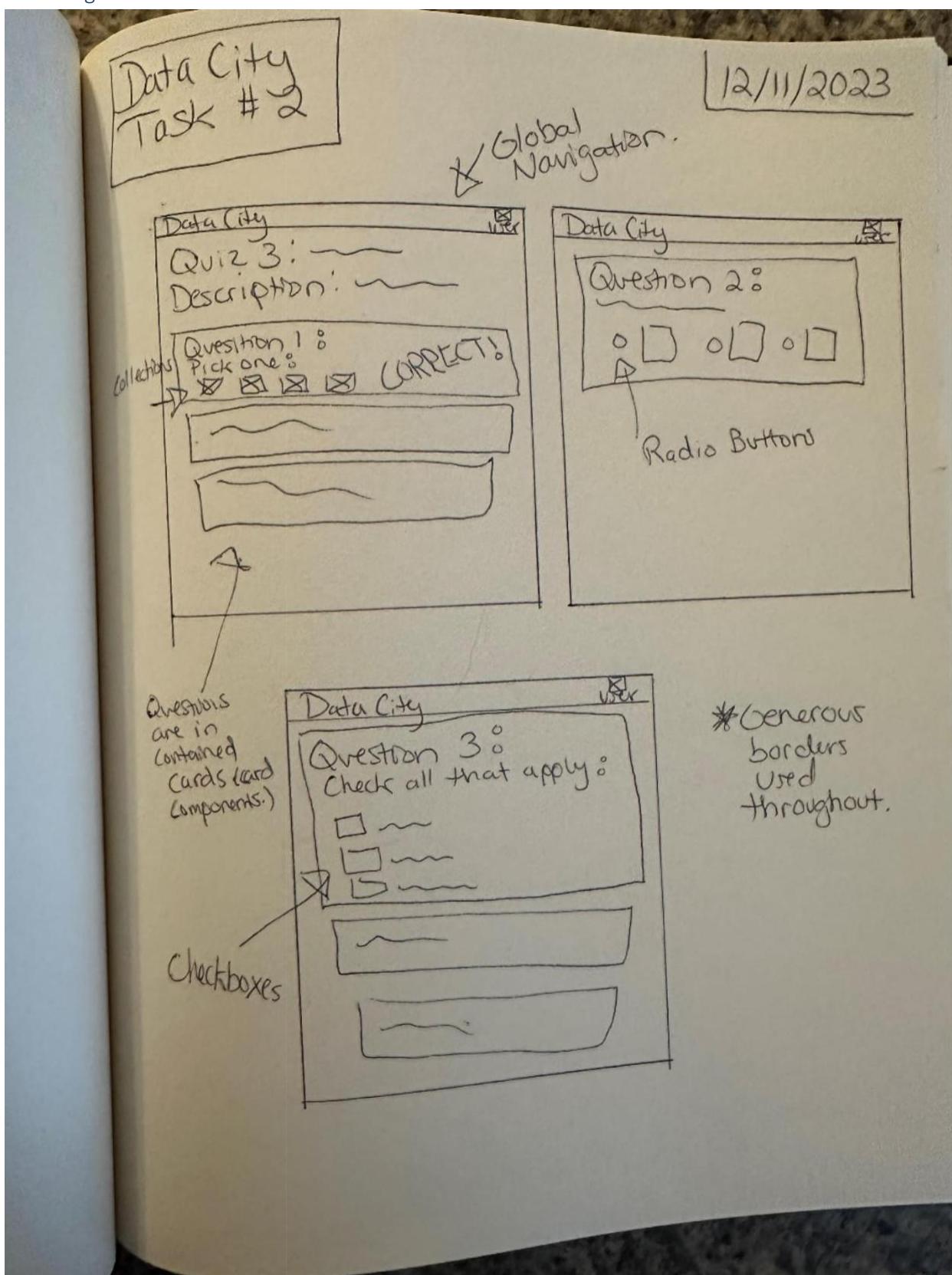
Task 2: Quizzes

Framer was used to develop an interactive quiz page. Each quiz question, along with interactions, is contained inside of a card. Each card is a customized component, created separately and then added to the quiz page of the prototype. A user can choose an answer to a quiz question and will receive instant feedback on whether it is correct or not. A user can also reset a question to its uncompleted state.

Task 2 Prompt

Starting on your homepage, click on Quiz 3: Utility Visualization. Try out all three of the quiz questions. You can reset questions if you get them wrong and try again. Once you are done, scroll back to the top and click on Home to return to your homepage.

Sketching



Task 2: Step-by-Step Walkthrough

Data City: Learn Data Science While Building Your Own City

Home Help Logout

Welcome to your dashboard, UserXYZ!

Refresh

City Progress: 🌱 🏠

Modules	Quizzes	Challenges
Module 1: Data Park  Introduction to Data Science: The foundational elements of data science, including data types, collection, and basic analysis. ✓	Quiz 1: Data Park Basics  Test your understanding of fundamental data science concepts. ✓	Challenge 1: Data Park Collection Challenge  Collect and analyze basic city data sets, learning the essentials of data gathering and interpretation. ✓
Module 2: Residential Analytics  Data Cleaning and Preprocessing: The crucial tasks of data cleaning and preprocessing. ✓	Quiz 2: Residential Data Clean-Up  Test your understanding of data cleaning and preprocessing. ✓	Challenge 2: Residential Area Data Organizing Challenge  Tackle data cleaning and preprocessing tasks to maintain order in the city's residential areas, dealing with missing data and noise. ✓
Module 3: Utility DataWorks  Data Visualization: Learn to transform raw data into compelling visual narratives. ✓	Quiz 3: Utility Visualization  Gauge your skills in data visualization. ↗	Challenge 3: Utility DataWorks Visualization Project  Create engaging visualizations of the city's water and electricity data, learning to communicate insights effectively through visual means.

Step 1: Starting from the homepage, click on Quiz 3: Utility Visualization.



Quiz 3: Utility Visualization



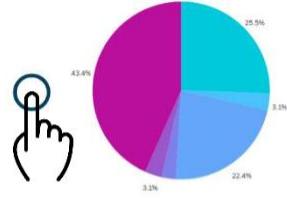
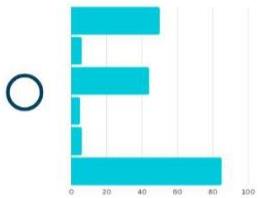
Quiz 3: Utility Visualization



Gauge your skills in data visualization.

Question 1

Which image correctly represents a pie chart?:



Question 2

Select the image of the line chart:



Step 2: Select an answer for the first quiz question.



Quiz 3: Utility Visualization



Quiz 3: Utility Visualization

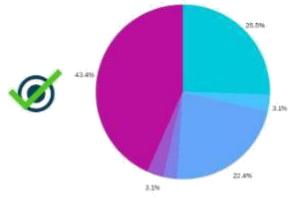
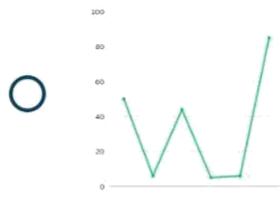


Gauge your skills in data visualization.

Question 1

[Reset](#)

Which image correctly represents a pie chart?:



CORRECT!

Question 2

Select the image of the line chart:



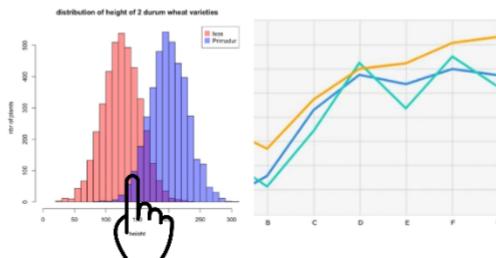
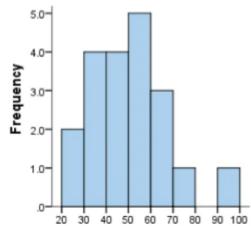
Step 3: Your answer is correct!

Quiz 3: Utility Visualization

CORRECT!

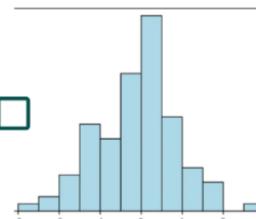
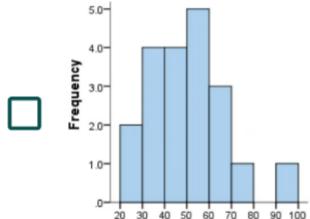
Question 2

Select the image of the line chart:



Question 3

Select ALL bar charts:



SUBMIT

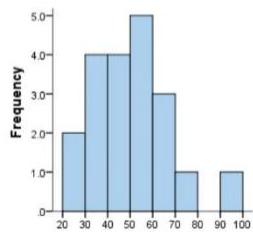
Step 4: Select an answer for the second quiz question.

Quiz 3: Utility Visualization

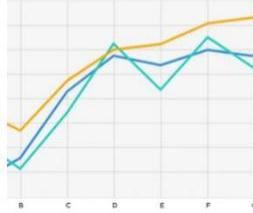
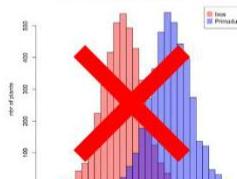
CORRECT!

Question 2

Select the image of the line chart:



distribution of height of 2 durum wheat varieties

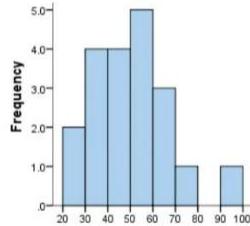


WRONG ANSWER!



Question 3

Select ALL bar charts:



SUBMIT

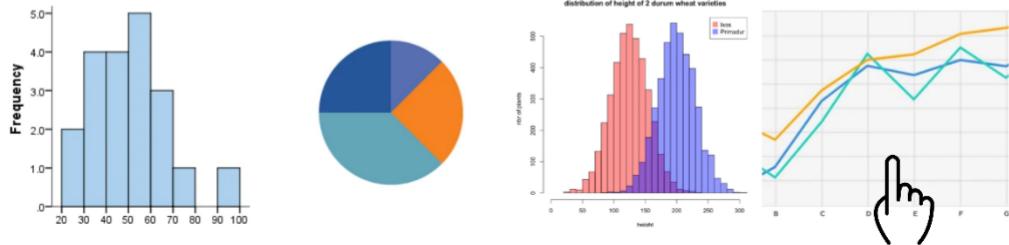
Step 5: That's the wrong answer! Click on Reset to reset the question.

Quiz 3: Utility Visualization

CORRECT!

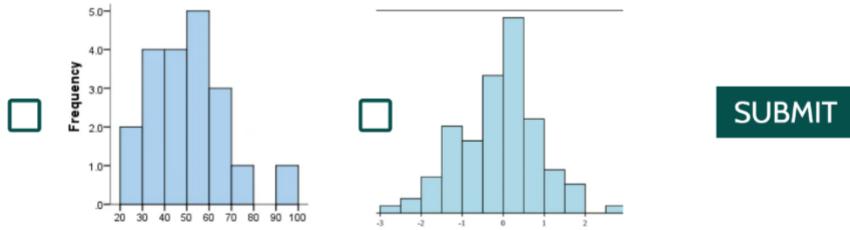
Question 2

Select the image of the line chart:



Question 3

Select ALL bar charts:



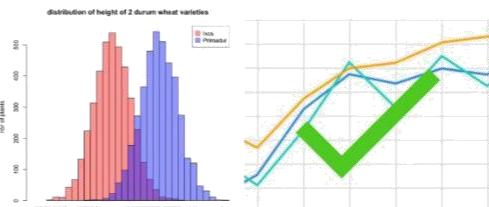
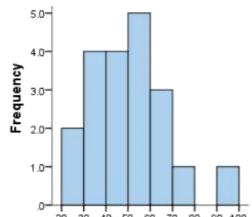
Step 6: Select another answer for quiz question 2.

Quiz 3: Utility Visualization

CORRECT!

Question 2

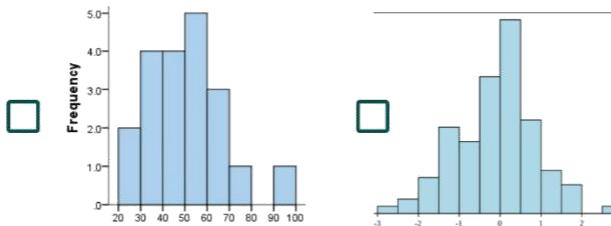
Select the image of the line chart:



CORRECT!

Question 3

Select ALL bar charts:



SUBMIT

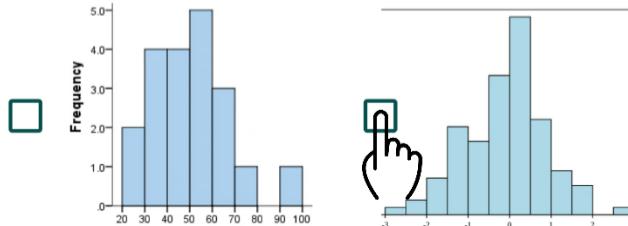
Step 7: The answer is correct. Move on to quiz question 3.

Quiz 3: Utility Visualization

CORRECT!

Question 3

Select ALL bar charts:



SUBMIT

That's all for now! Stay tuned for more.

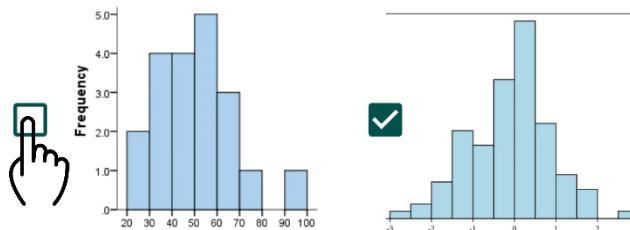
Step 8: Select the second checkbox.

Quiz 3: Utility Visualization

CORRECT!

Question 3

Select ALL bar charts:



SUBMIT

That's all for now! Stay tuned for more.

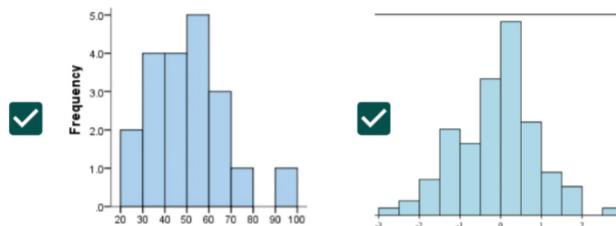
Step 9: Select the first checkbox.

Quiz 3: Utility Visualization

CORRECT!

Question 3

Select ALL bar charts:



SUBMIT



That's all for now! Stay tuned for more.

Step 10: Click submit.

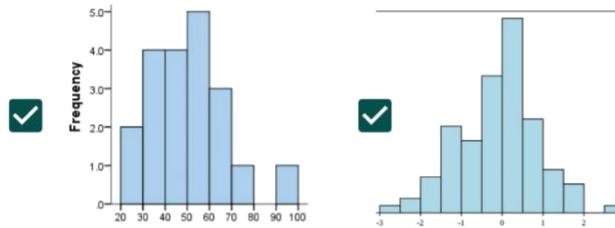
Quiz 3: Utility Visualization

CORRECT!

Question 3

↻Reset

Select ALL bar charts:



SUBMIT

CORRECT!

That's all for now! Stay tuned for more.

Step 11: Congrats, that's correct!

 Data City: Learn Data Science While Building Your Own City

Quiz 3: Utility Visualization



Quiz 3: Utility Visualization

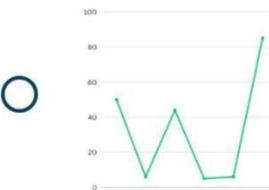


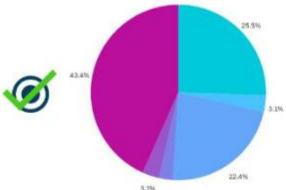
Gauge your skills in data visualization.

Question 1 

Which image correctly represents a pie chart?






43.4%
3.3%
22.4%
CORRECT!

Question 2 

Select the image of the line chart:



Step 12: Scroll back up to the top and press the house icon or Home to go back to the homepage.

Design Patterns/Interactive Elements

- **Generous Borders** – Large borders are used throughout the quiz questions, as well as the quiz page, to provide a good amount of room for accurate clicking or tapping.
- **Collections** – A collection of images is presented for one quiz question, focusing on the visual aspect of recognizing different types of charts.
- **Checkboxes and Radio Buttons** – Both checkboxes and radio buttons are used for various quiz question interactivity.

Task 3: Data Challenges

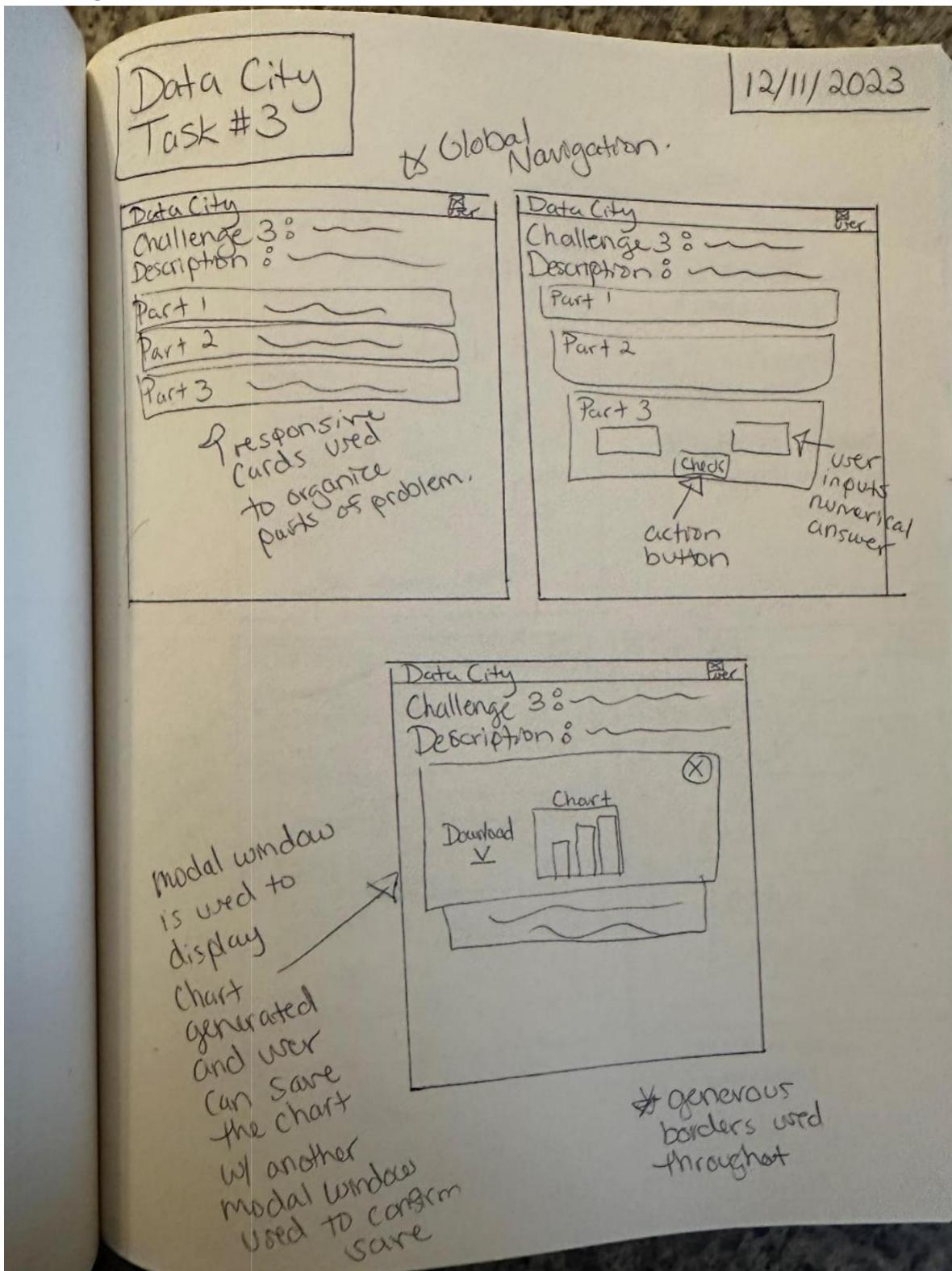
Framer was used to develop an interactive data challenges page. Each part of the data challenge is in its own card. The cards are organized in a Framer stack layout, keeping the design responsive, organized and compact. The final stacked frame encompasses interactivity for two inputs and an action button. This leads to a generated chart that the user can choose to save the chart or not. A modal window is used to inform the user if their save was successful.

Task 3 Prompt

Starting on your homepage, click on Challenge 3: Utility DataWorks Visualization Project. Read through Part 1, Part 2, and Part 3. Enter a water average and an electricity average. Click “Generate Bar Chart.”

Scroll down to look at the bar chart. Click download to download the bar chart. Once you are done, scroll to the top and click on Home to return to your homepage.

Sketching



Task 3: Step-by-Step Walkthrough

 Data City: Learn Data Science While Building Your Own City

Welcome to your dashboard, UserXYZ!

 Refresh

City Progress:

Modules	Quizzes	Challenges
 Module 1: Data Park  Introduction to Data Science: The foundational elements of data science, including data types, collection, and basic analysis. 	 Quiz 1: Data Park Basics  Test your understanding of fundamental data science concepts. 	 Challenge 1: Data Park Collection Challenge  Collect and analyze basic city data sets, learning the essentials of data gathering and interpretation. 
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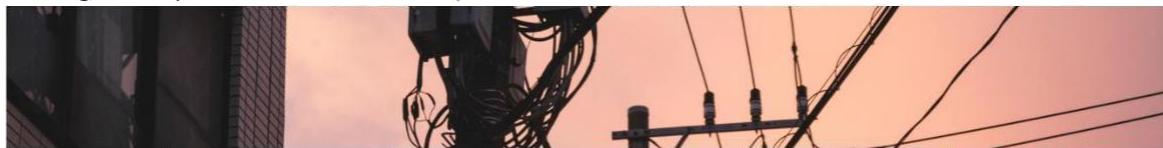
Step 1: Starting on the homepage, click on Challenge 3: Utility DataWorks Visualization Project.



Challenge 3: Utility DataWorks Visualization Project



Challenge 3: Utility DataWorks Visualization Project



Create engaging visualizations of the city's water and electricity data, learning to communicate insights effectively through visual means.

Part 1: Understanding the Data

Welcome to the Data Challenge!

Objective: Get acquainted with our dataset on city utilities.

Your Task: We've provided data on city water and electricity usage over the last 5 months. Your goal is to explore this data to understand usage trends.

Dataset:

- Water Usage (in million gallons): [15, 12, 18, 20, 16]
- Electricity Usage (in thousand MWh): [30, 35, 28, 40, 32]

Action: Examine the numbers and identify which month had the highest and lowest usage for both water and electricity.

Part 2: Performing Simple Statistics

Let's Dig Deeper!

Objective: Apply basic statistical analysis to our dataset.

Your Task: Calculate the average usage for both water and electricity over the last 5 months.

Action: Calculate the average for both datasets.

Part 3: Visualization with Bar Chart

Step 2: Read through the first two parts of the challenge.

Challenge 3: Utility DataWorks Visualization Project

Part 2: Performing Simple Statistics

Let's Dig Deeper!

Objective: Apply basic statistical analysis to our dataset.

Your Task: Calculate the average usage for both water and electricity over the last 5 months.

Action: Calculate the average for both datasets.

Part 3: Visualization with Bar Chart

Bring Data to Life!

Objective: Learn to visually represent data.

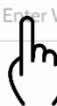
Your Task: Create a bar chart using the averages you calculated for water and electricity usage.

Action:

Input your calculated averages into the designated fields.
Watch as your inputs dynamically generate a bar chart, visually comparing the average usage of water and electricity.

- Input Field for Water Average: [Your Answer Below]
- Input Field for Electricity Average: [Your Answer Below]

Note: Your bar chart will update automatically as you input the averages.



Enter Water Average...

Enter Electricity Average...

GENERATE BAR CHART

Step 3: Read the third part of the challenge and click on the “Enter Water Average...” field to input your number.

Challenge 3: Utility DataWorks Visualization Project

Part 2: Performing Simple Statistics

Let's Dig Deeper!

Objective: Apply basic statistical analysis to our dataset.

Your Task: Calculate the average usage for both water and electricity over the last 5 months.

Action: Calculate the average for both datasets.

Part 3: Visualization with Bar Chart

Bring Data to Life!

Objective: Learn to visually represent data.

Your Task: Create a bar chart using the averages you calculated for water and electricity usage.

Action:

Input your calculated averages into the designated fields.

Watch as your inputs dynamically generate a bar chart, visually comparing the average usage of water and electricity.

- Input Field for Water Average: [Your Answer Below]
- Input Field for Electricity Average: [Your Answer Below]

Note: Your bar chart will update automatically as you input the averages.

16.2

Enter Electricity Average...



GENERATE BAR CHART

Step 4: Click on the “Enter Electricity Average...” to input your number.

Challenge 3: Utility DataWorks Visualization Project

Part 2: Performing Simple Statistics

Let's Dig Deeper!

Objective: Apply basic statistical analysis to our dataset.

Your Task: Calculate the average usage for both water and electricity over the last 5 months.

Action: Calculate the average for both datasets.

Part 3: Visualization with Bar Chart

Bring Data to Life!

Objective: Learn to visually represent data.

Your Task: Create a bar chart using the averages you calculated for water and electricity usage.

Action:

Input your calculated averages into the designated fields.

Watch as your inputs dynamically generate a bar chart, visually comparing the average usage of water and electricity.

- Input Field for Water Average: [Your Answer Below]
- Input Field for Electricity Average: [Your Answer Below]

Note: Your bar chart will update automatically as you input the averages.

16.2

33

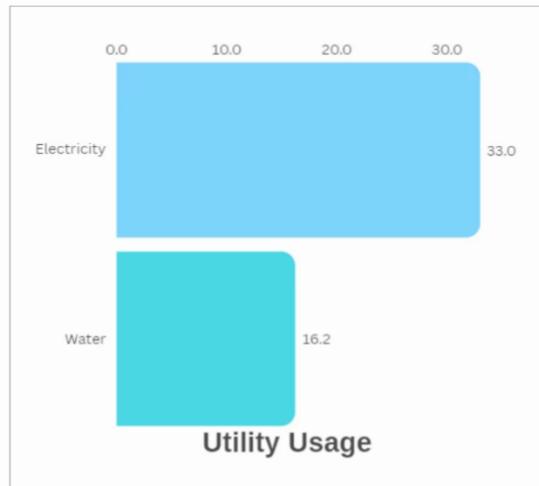
GENERATE BAR CHART



Step 5: Click on “Generate Bar Chart.”

Challenge 3: Utility DataWorks Visualization Project

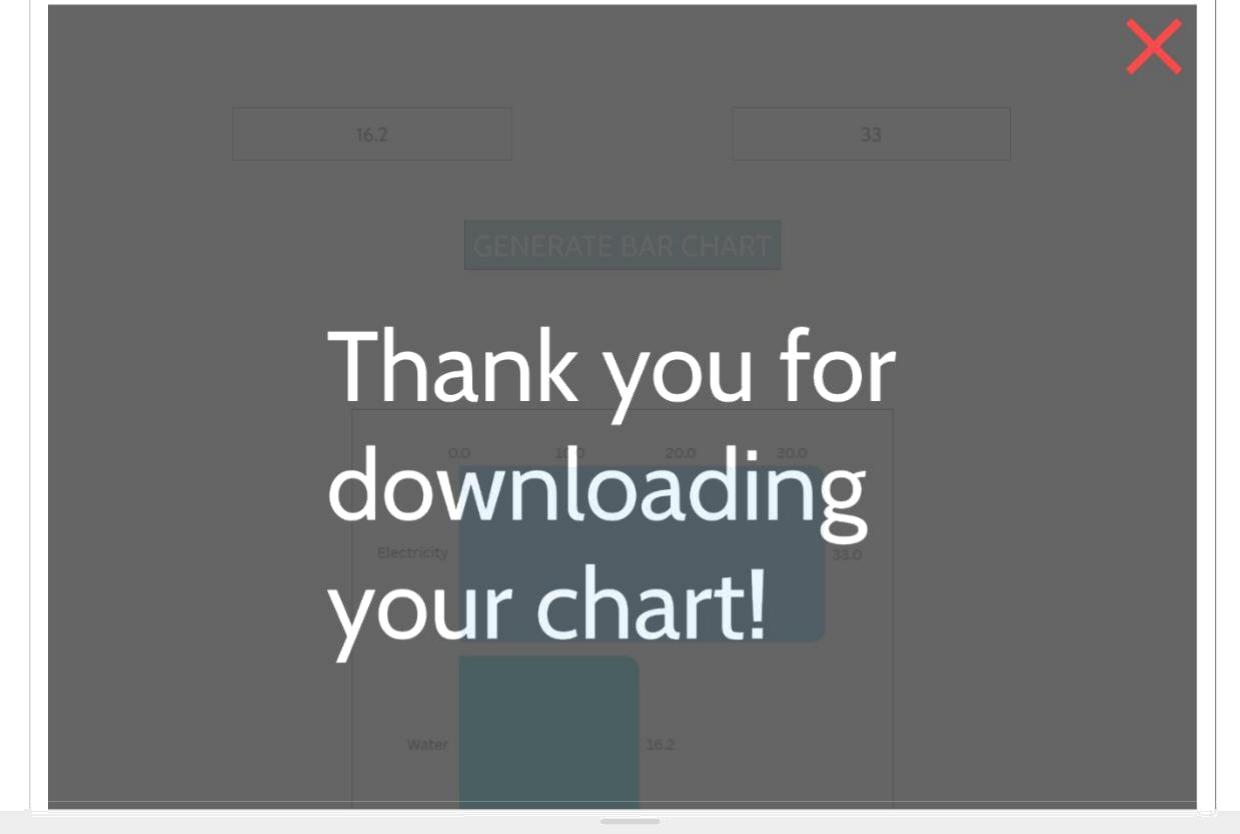
GENERATE BAR CHART



Download

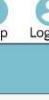
Step 6: Scroll down to view your generated bar chart. Click on download to download the chart.

Challenge 3: Utility DataWorks Visualization Project



Step 7: A modal window confirms that you downloaded the chart.

 Data City: Learn Data Science While Building Your Own City

Challenge 3: Utility DataWorks Visualization Project



Create engaging visualizations of the city's water and electricity data, learning to communicate insights effectively through visual means.

Part 1: Understanding the Data

Welcome to the Data Challenge!

Objective: Get acquainted with our dataset on city utilities.

Your Task: We've provided data on city water and electricity usage over the last 5 months. Your goal is to explore this data to understand usage trends.

Dataset:

- Water Usage (in million gallons): [15, 12, 18, 20, 16]
- Electricity Usage (in thousand MWh): [30, 35, 28, 40, 32]

Action: Examine the numbers and identify which month had the highest and lowest usage for both water and electricity.

Part 2: Performing Simple Statistics

Let's Dig Deeper!

Objective: Apply basic statistical analysis to our dataset.

Your Task: Calculate the average usage for both water and electricity over the last 5 months.

Action: Calculate the average for both datasets.

Part 3: Visualization with Bar Chart

Step 8: Scroll back up to the top and click on the house icon or the word Home to return to the homepage.

Design Patterns/Interactive Elements

- **Cards** – Cards are used for each part of the data challenge, as well as the last part of the challenge that contains additional interactive elements.
- **Modal Windows** – A modal window is used to inform a user they successfully saved their generated chart.
- **Action Button and Input Fields** – Both input fields and an action button is used to gather information from a user and generate a bar chart.
- **Generous Borders** – Large borders are used throughout, particularly within the card that houses the action button and input fields.

Chapter 3 - Content-Fidelity Matrix Fit

Content	Very-Low Fidelity	Low Fidelity	Medium Fidelity	High Fidelity	Very-High Fidelity
Information Design					X

Interaction Design				X	
Visual/ Branding Design					X
Editorial Content					X

Information Design:

- I chose **Very-High Fidelity** for the **Information Design** because I used a consistent layout, global navigation, and a general theme throughout the entire prototype. Placement of options is very organized, heavily using Framer's stacks and grids, keeping the information design responsive, clear, and efficient.

Interaction Design:

- I chose **High Fidelity** for **Interaction Design** on this prototype. Most of the Framer components I customized and/or created from scratch are highly interactive. Venturing into code components for more complex interactions would most likely instantly move the prototype up to Very-High Fidelity. Additionally, building out other interactions, such as Help, and User Account would improve the interactivity complexity.

Visual Design/Branding:

- I chose **Very-High Fidelity** for the **Visual Design/Branding** due to my theme of urban planning combined with data science for a learning platform. I created both a logo and a name for the application, as well as used real, relevant images throughout. Additionally, there is a distinct color palette, as well as font used throughout. The brand idea is very clear in every functional area of the prototype.

Editorial Content:

- I chose **Very-High Fidelity** for the **Editorial Content** because the overall prototype does not use any filler text. Real and relevant content is used, including titles, lessons, quiz questions, data challenges, and more. The goal of this prototype was to clearly demonstrate the full potential of the application, as well as giving a clear picture of how the final product will look and function.

Chapter 4 - Framer: Advantages and Disadvantages

Advantages

Custom Components:

- Similar to Figma:** Like Figma, Framer offers the capability to create custom components. This feature is essential for designers who want to tailor interactive elements specifically to their project's needs.
- Ease of Learning:** The process of learning and creating custom components in Framer is fairly intuitive. The learning curve is not steep, making it accessible for users who are new to the tool or to UI/UX design.

Layouts:

- **CSS Flexbox and Grid Formats:** Framer allows for efficient organization of components, text, and other elements in layouts that mirror CSS Flexbox and Grid systems. This feature is particularly useful for maintaining responsive designs and aligning UI elements effectively.

Disadvantages

Lack of Pre-Made Components:

Unlike Balsamiq or draw.io, Framer has a limited selection of pre-made components. This means that users often must create most components from scratch, which can be time-consuming and may require a higher level of skill.

Code Components and Code Overrides:

The ability to override the behavior, look, etc. of a prototype with JavaScript is very powerful and can be used to create highly complex interactivity. However, this functionality has a strong learning curve and minimal training resources available for it.

Chapter 5 - Framer vs. Other Tools

- **Customization:** Framer excels in allowing for a high degree of customization with its custom components, which can be a significant advantage over some other tools (like Balsamiq). However, this also means a slightly higher entry barrier for complete beginners.
- **Learning Curve:** Framer's learning curve is relatively gentle compared to some other advanced tools (similar learning curve to Figma), making it a good middle ground for those transitioning from more basic tools but not yet ready for the complexities of more advanced software.
- **Component Library:** One of the main drawbacks when comparing Framer to tools like Figma is the lack of an extensive pre-made component library. While Figma and others offer a wide range of ready-to-use components, Framer requires more effort in this area.
- **Design Responsiveness:** Framer's focus on layouts that mimic CSS structures is beneficial for designers, as well as front-end developers, who are also mindful of how their designs will translate into actual web development, potentially offering a smoother transition from design to development.

Chapter 6 - User Evaluation

Prompts

- **Task 1 Prompt:** Starting on your homepage, click on Module 3: Utility DataWorks. Click the dropdown arrow for Lesson 1: Types of Visualizations. Scroll down and look through the slideshow of different types of charts. Scroll down further and read the Knowledge Check. Try to spot which definition is wrong and click on it. Scroll to the top and click on Home to go back to your homepage.
- **Task 2 Prompt:** Starting on your homepage, click on Quiz 3: Utility Visualization. Try out all three of the quiz questions. You can reset questions if you get them wrong and try again. Once you are done, scroll back to the top and click on Home to return to your homepage.

- **Task 3 Prompt:** Starting on your homepage, click on Challenge 3: Utility DataWorks Visualization Project. Read through Part 1, Part 2, and Part 3. Enter a water average and an electricity average. Click “Generate Bar Chart.” Scroll down to look at the bar chart. Click download to download the bar chart. Once you are done, scroll to the top and click on Home to return to your homepage.

Setup for Studies

The user study was conducted in-person for both participants. The participants sat at the computer with the Framer prototype open. I gave each participant the prompt, one at a time. I also instructed each participant to think aloud throughout the duration of the study.

Participant 1: Danny

- **Task 1:** Smoothly navigated and interacted with the content.
- **Task 2:** Completed the quiz effortlessly.
- **Task 3:** Efficiently navigated and interacted with the project cards, confirming the intuitive design and ease of use.

Participant 2: Todd

- **Task 1:** Took longer in identifying the incorrect definition, suggesting a need for clearer highlighting of key information.
- **Task 2:** Struggled with one question but utilized the reset feature effectively, highlighting its usefulness.
- **Task 3:** Took more time in understanding and analyzing the content, suggesting a potential need for more guided instructions or simplified data entry processes for users who might need additional assistance.

Lessons Learned

- There's room for improvement in making key information more prominent and providing additional guidance for users who may require more time to understand complex content.
- Interactive elements like the reset feature in quizzes are highly beneficial and should be considered in other learning modules.