



Projects & Collaboration with Git

FinTech Boot Camp



Project Week Overview

Class Objectives



Articulate the requirements for Project 1.



Draw and interpret diagrams of Git branching workflows.



Create new branches with Git.



Push local branches to GitHub.

Project Week! (This Week)

Day 1	Day 2	Day 3
Form Groups	Hardcore Development	Hardcore Development
Outline Project Ideas		
Initial Data Exploration		
Begin Research of Datasets		
Submit Project Proposal for Approval		

Project Week! (Next Week)

Day 4	Day 5	Day 6
Hardcore Development	Hardcore Development	Presentations
	Presentation Prep	

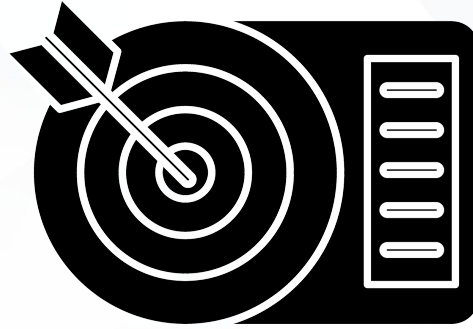


Time to divide into teams!

Project 1



FinTech Financial Programming and Quantitative Analysis



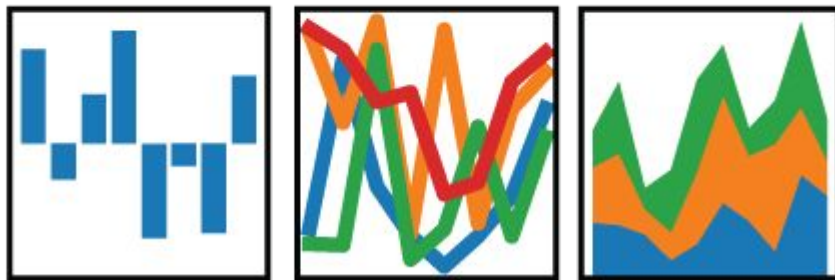
Project Requirements

Development Requirements

Use Pandas to **clean and format** your dataset(s).

pandas

$$y_{it} = \beta' x_{it} + \mu_i + \epsilon_{it}$$

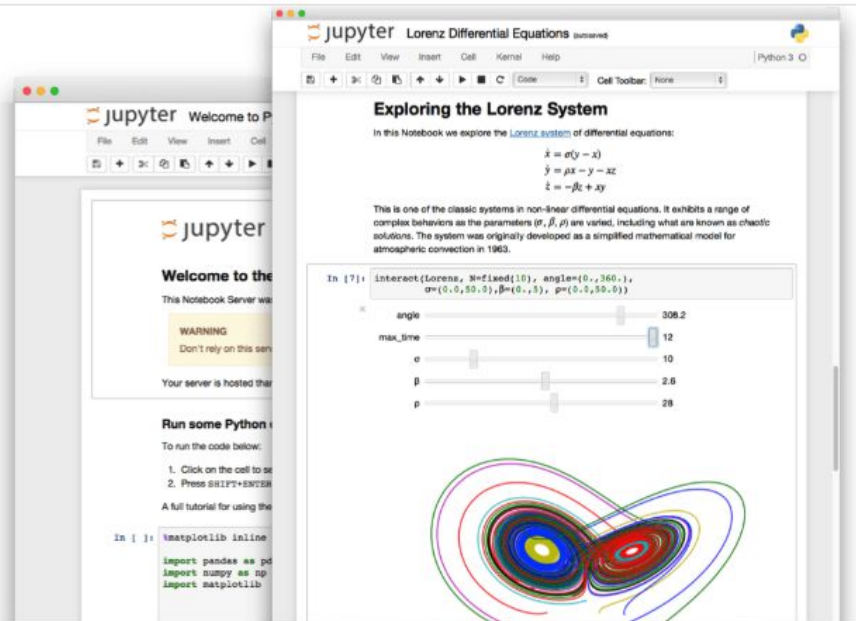


Development Requirements

Create a Jupyter Notebook describing the **data exploration and cleanup** process.



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The Jupyter Notebook

The Jupyter Notebook is an open-source web application that allows you to create and share documents that contain live code, equations, visualizations and narrative text. Uses include: data cleaning and transformation, numerical simulation, statistical modeling, data visualization, machine learning, and much more.

[Try it in your browser](#)

[Install the Notebook](#)

Development Requirements

Create a Jupyter Notebook illustrating the **final analysis**.



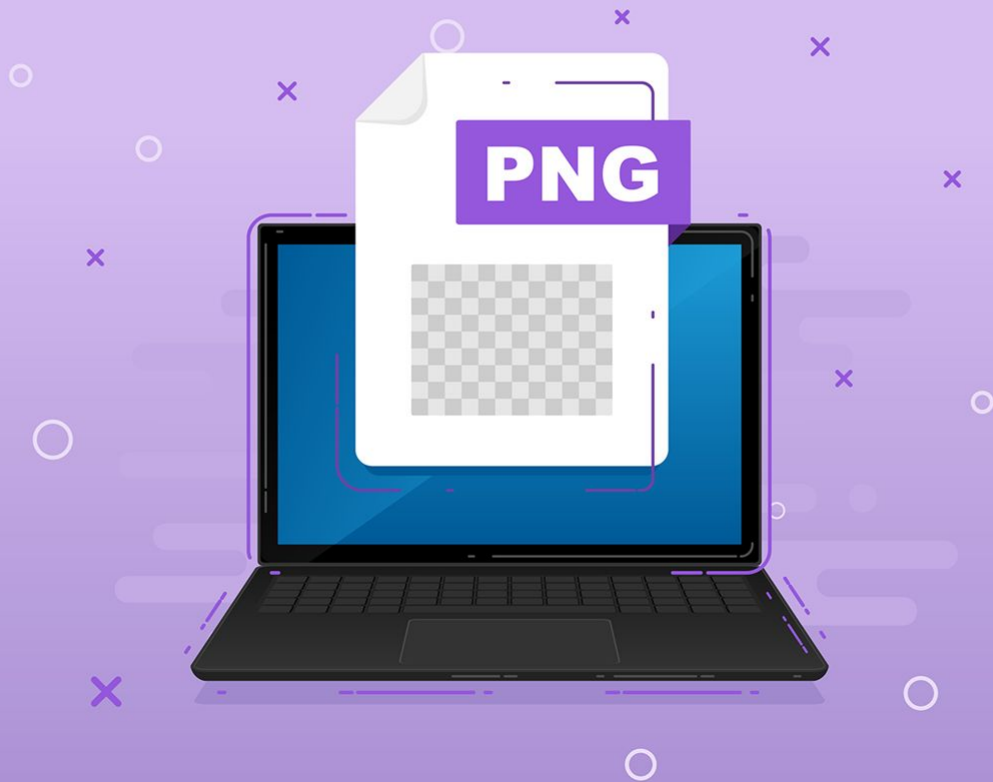
Development Requirements

Use PyViz, Panel, Plotly Express, and Hvplot to create a total of 6–8 visualizations of your data (ideally, at least 2 per "question" you ask of your data) and then aggregate these visualizations into a dashboard.



Development Requirements

Save PNG images of your visualizations to distribute to the class and instructional team, and for inclusion in your presentation and your repo's `README.md` file.



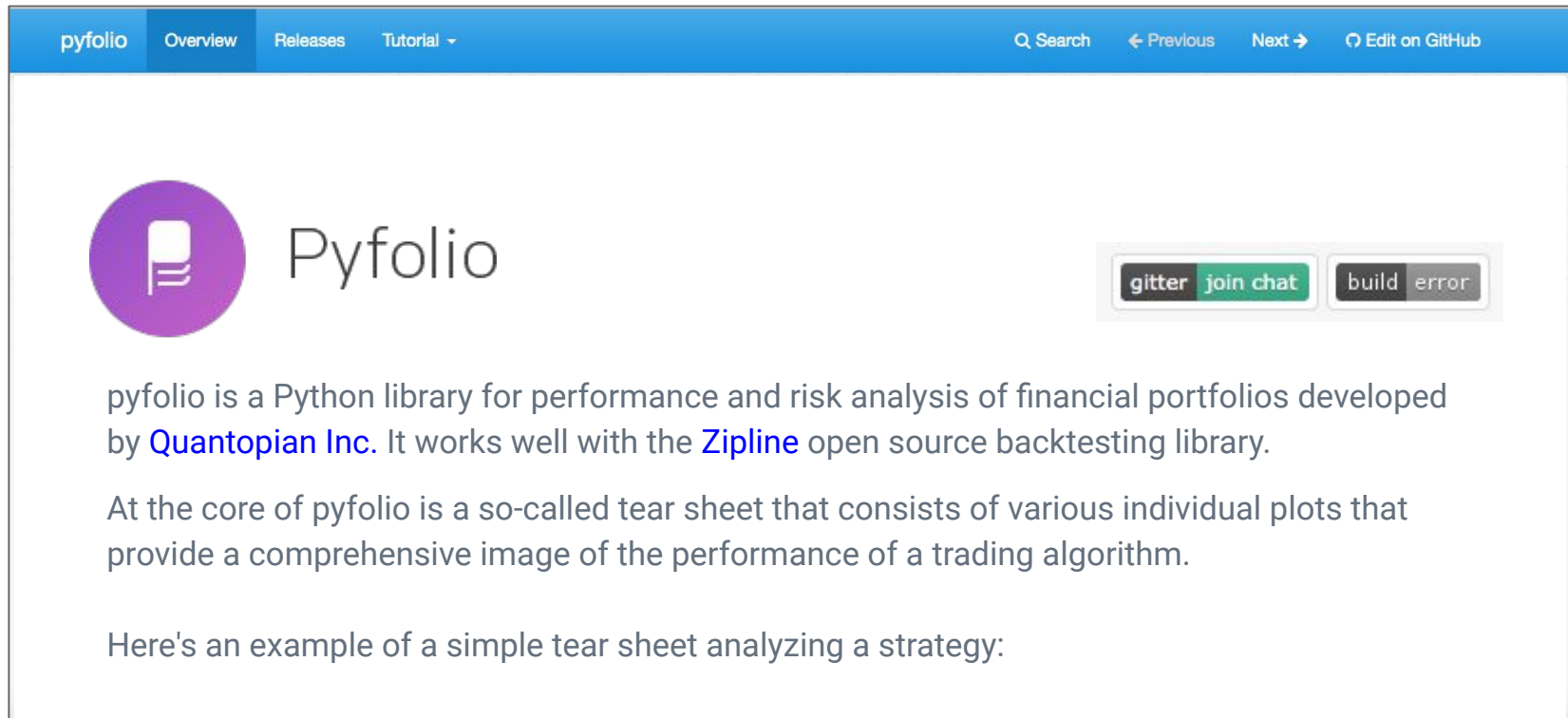
Development Requirements

Optionally, use at least one API, if you can find an API with data pertinent to your primary research questions.



Development Requirements

Use one new Python library that hasn't been covered in class.



The screenshot shows the GitHub repository page for Pyfolio. The header is blue with navigation links: 'pyfolio', 'Overview', 'Releases', and 'Tutorial'. On the right, there are links for 'Search', 'Previous', 'Next', and 'Edit on GitHub'. The main content area features the Pyfolio logo (a purple circle with a white icon) and the text 'Pyfolio'. To the right of the logo are buttons for 'gitter', 'join chat', 'build', and 'error'. Below the logo, the text describes Pyfolio as a Python library for performance and risk analysis of financial portfolios, developed by Quantopian Inc. It mentions that it works well with the Zipline open source backtesting library. The text further explains that at the core of Pyfolio is a 'tear sheet' consisting of various individual plots that provide a comprehensive image of the performance of a trading algorithm. Finally, it states: 'Here's an example of a simple tear sheet analyzing a strategy:'.

pyfolio is a Python library for performance and risk analysis of financial portfolios developed by [Quantopian Inc.](#) It works well with the [Zipline](#) open source backtesting library.

At the core of pyfolio is a so-called tear sheet that consists of various individual plots that provide a comprehensive image of the performance of a trading algorithm.

Here's an example of a simple tear sheet analyzing a strategy:

Development Requirements

Create a `README.md` in your repo with a write-up summarizing your major findings. This should include a heading for each "question" you asked of your data, and under each heading, a short description of what you found and any relevant plots.



Presentation Requirements

You will also be responsible for preparing a formal, 10-minute presentation that covers:



Questions you found interesting and what motivated you to answer them



Where and how you found the data you used to answer these questions



The data exploration and cleanup process (accompanied by your Jupyter Notebook)



The analysis process (accompanied by your Jupyter Notebook)



Your conclusions, which should include a numerical summary and visualizations of that summary



The implications of your findings: what do your findings mean? How do they impact Finance?

Suggested Data Sources

Suggestions for Data Sources

Feel free to ask us (the instructional staff) for input, but our general advice is to stick to data sources that:



Are sufficiently large.



Have a consistent format.



Ideally, contain more data than needed.

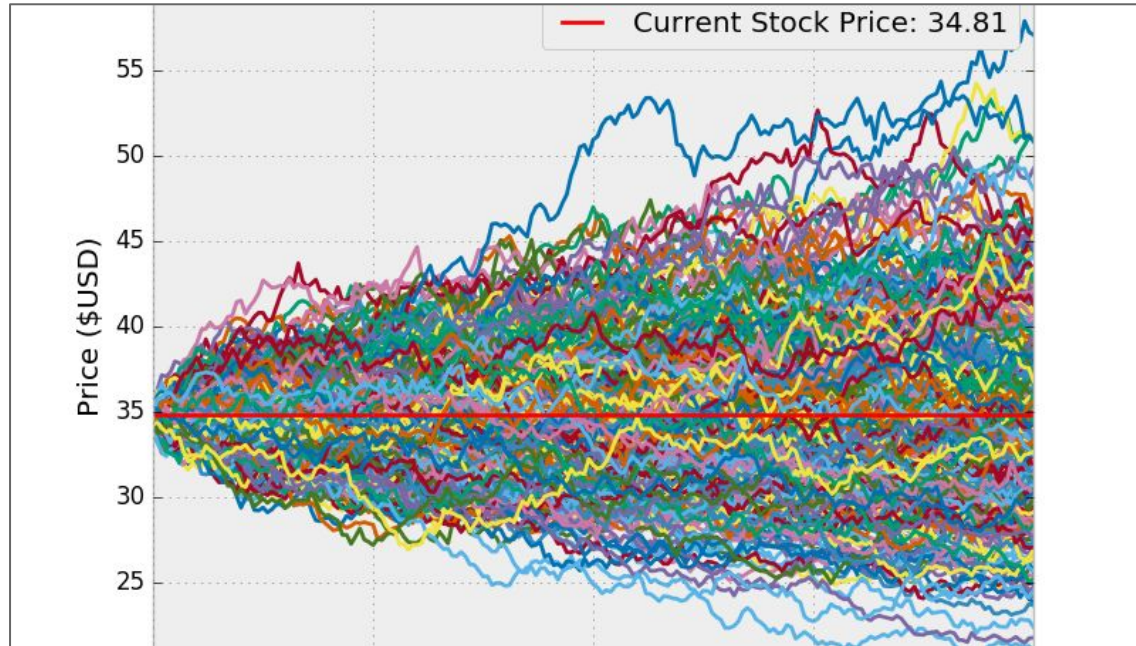


Are well-documented.

Example Project Ideas

Portfolio Analyzer

Prepare a tearsheet for a portfolio that includes calculations, tables, charts, financial models, Monte Carlo simulations and statistical analysis of portfolio performance for a given portfolio.



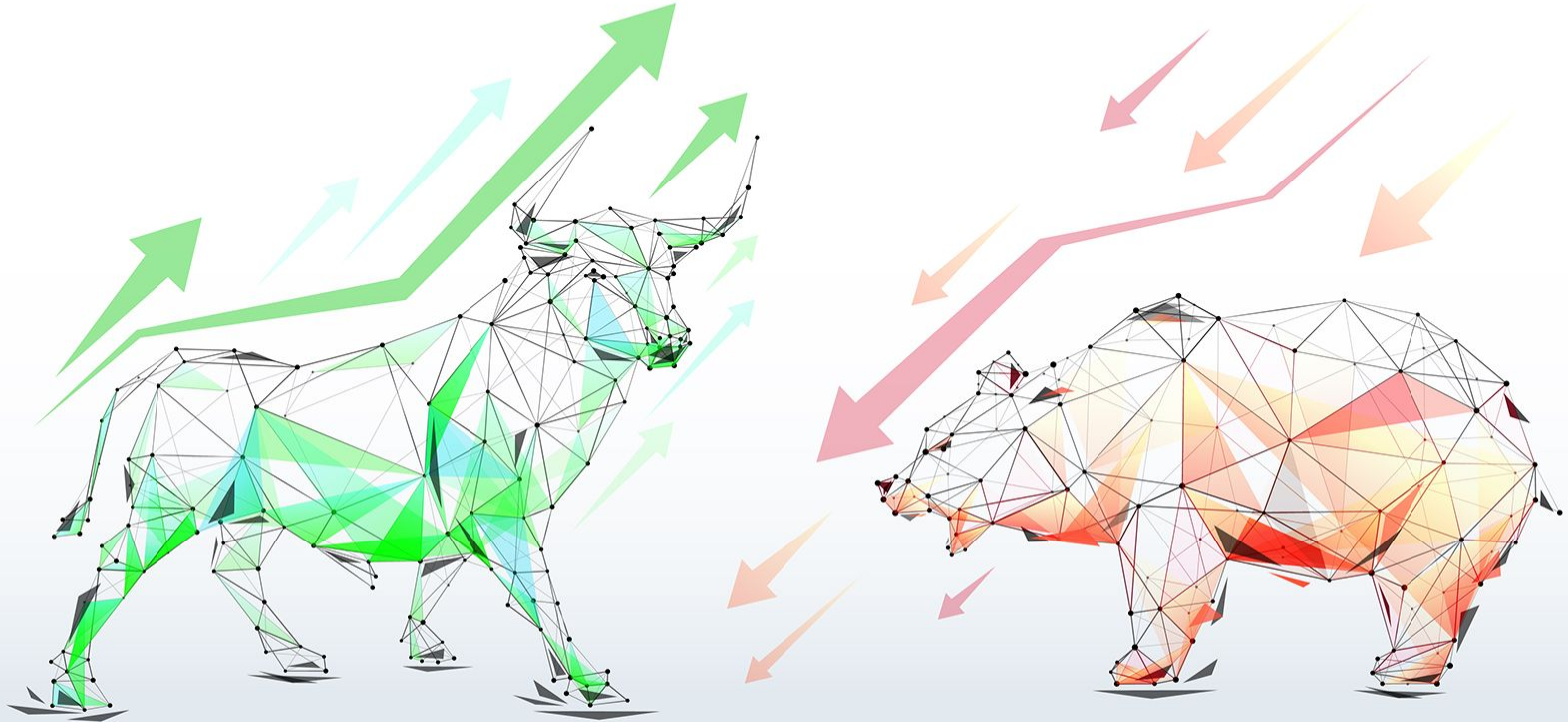
Portfolio Analyzer

Create and host a dashboard for the tearsheet with interactive visualizations and a storyboard interface.



Portfolio Analyzer

What do your results suggest about the current portfolio performance?
What would you recommend customizing to improve the portfolio?



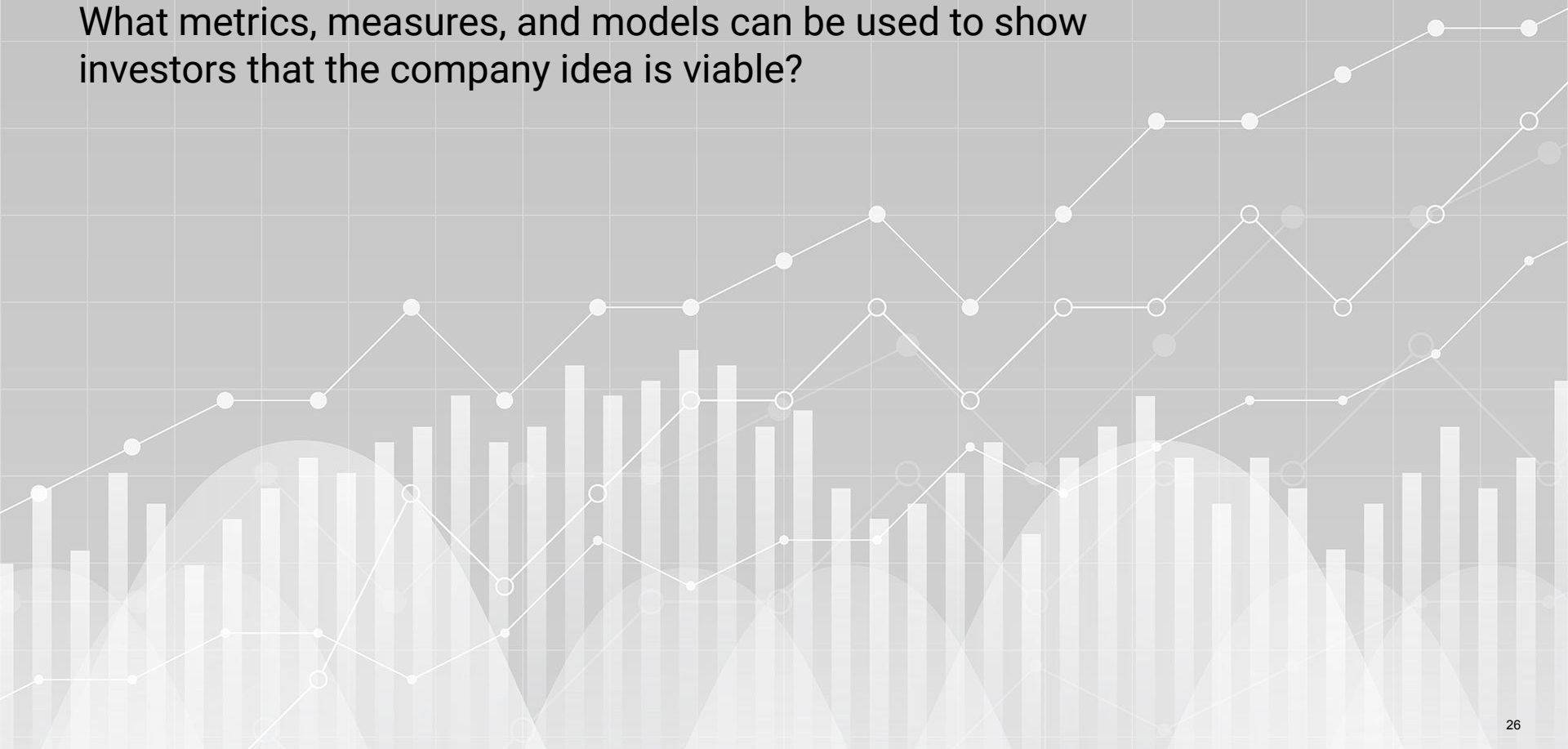
Fund my FinTech!

Fund my FinTech is a business valuation use case. Entrepreneurs would like to fund their new business with a crowdfunding platform. In order to do that, they need to prove to potential investors that their company is viable.



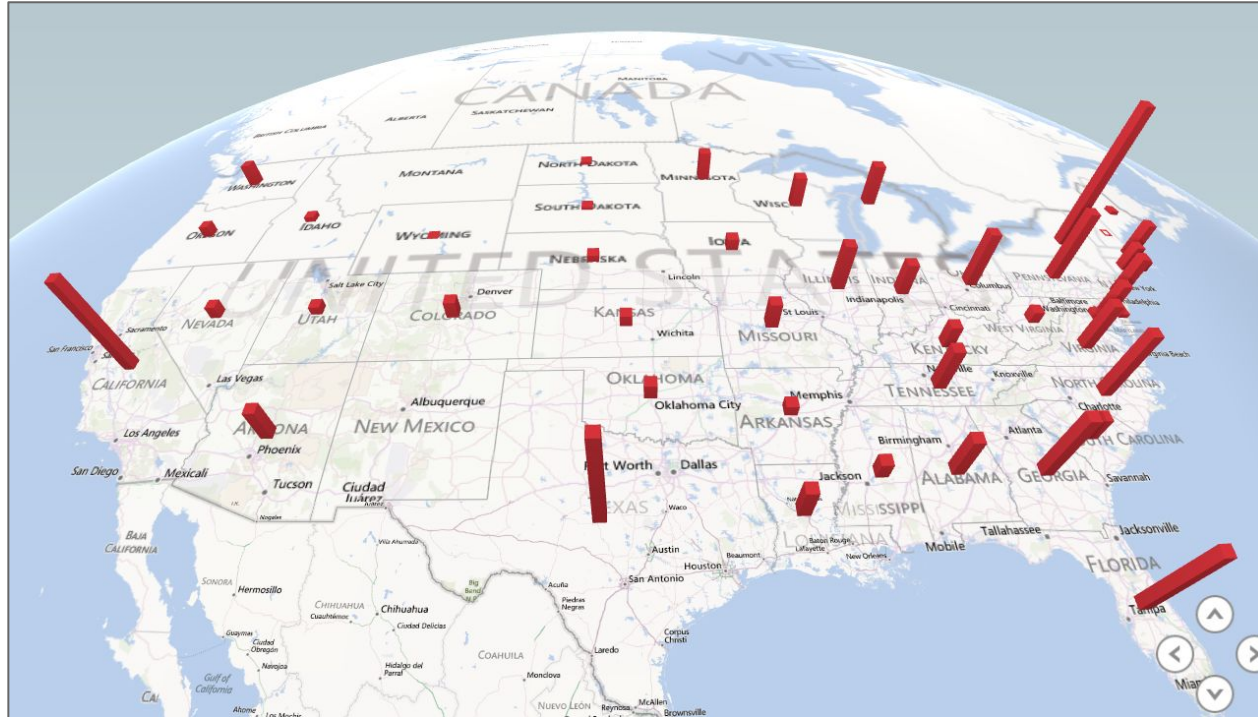
Fund my FinTech! Financial Valuation

What metrics, measures, and models can be used to show investors that the company idea is viable?



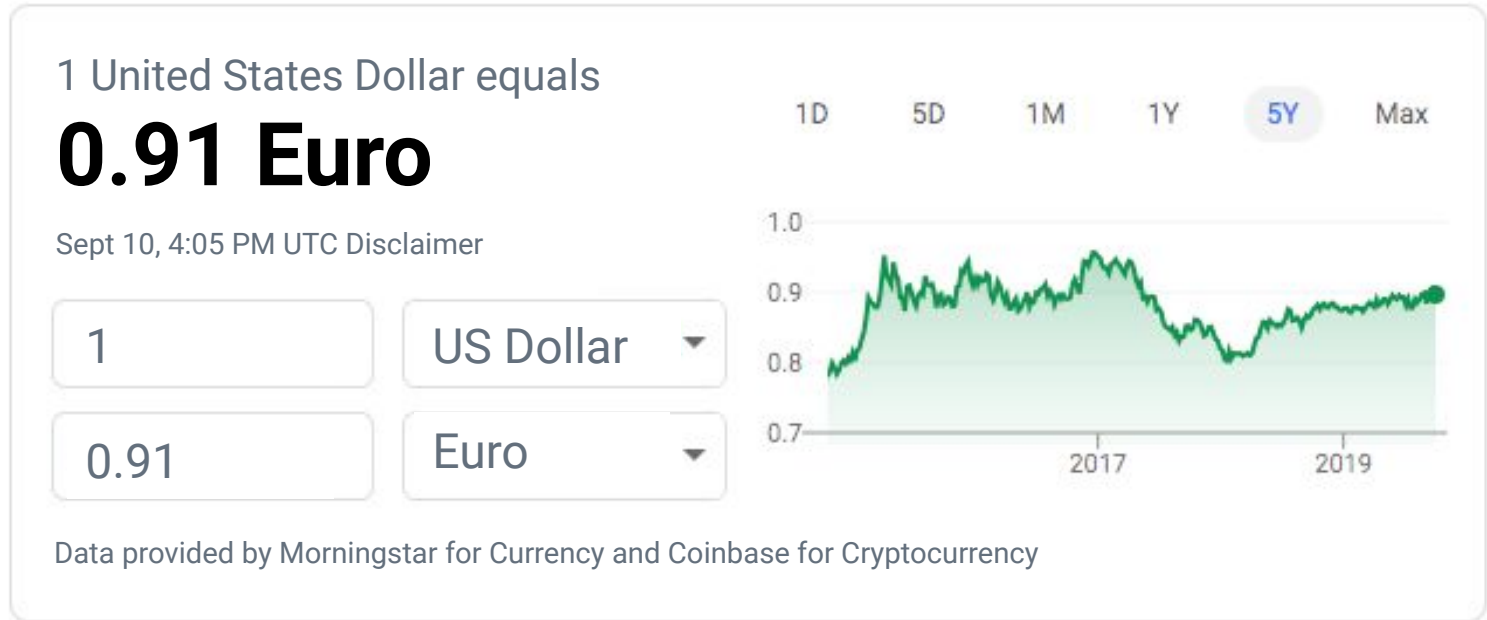
Fund my FinTech! Location Analysis

What analysis shows that the proposed location or country for the business will be profitable? **Can you compare one location to another?**



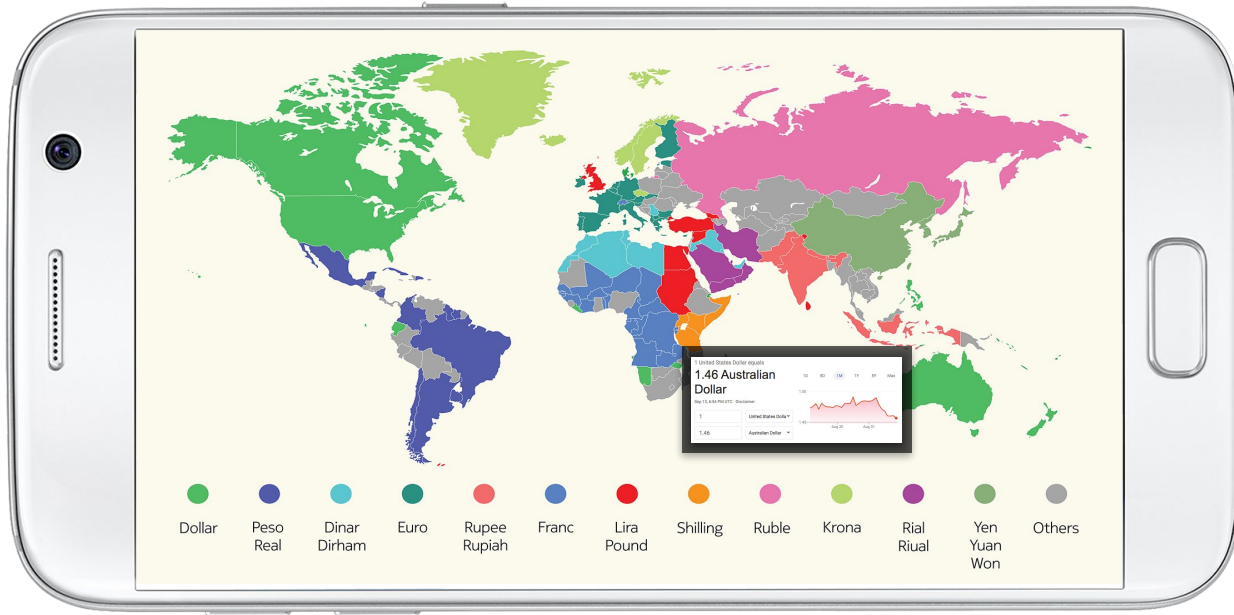
Currency Calculator

A travel agency has hired your team to build a currency calculator into their travel planner. This calculator will be hosted as an interactive dashboard application.



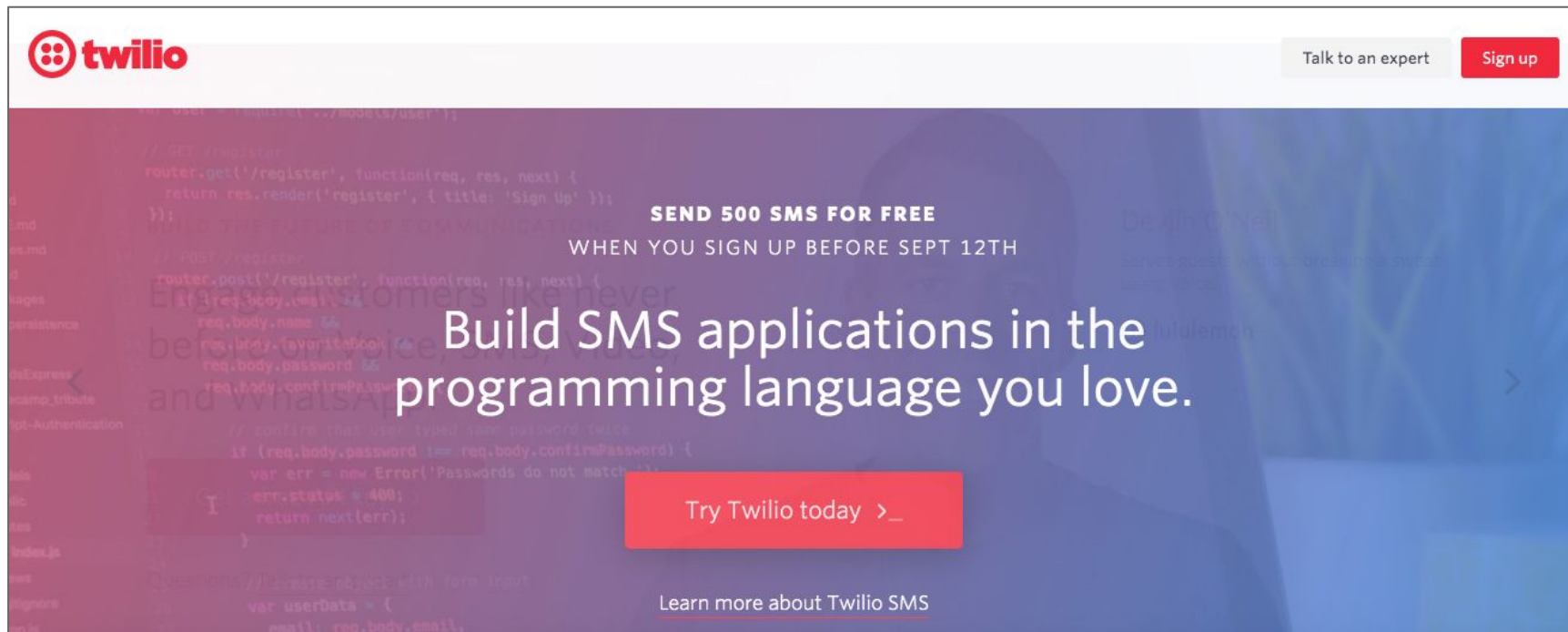
Currency Calculator

This calculator not only provides real-time conversions to/from a variety of currencies, but it also provides interactive maps that allow travelers to view and compare exchange markets for different locations



Currency Calculator

The application will also prepare a report on the selected locations and send that to a registered mobile number using tools such as [Twilio](#).



The image is a screenshot of the Twilio website. At the top left is the Twilio logo. At the top right are two buttons: "Talk to an expert" and "Sign up". The main content area features a dark background with a faint image of a person. Overlaid on this is a large block of white text that reads "Build SMS applications in the programming language you love." To the left of this text is a snippet of JavaScript code. Above the main text, there is a promotional offer: "SEND 500 SMS FOR FREE WHEN YOU SIGN UP BEFORE SEPT 12TH". Below the main text is a red button that says "Try Twilio today >_". At the bottom right, there is a link that says "Learn more about Twilio SMS".

twilio

Talk to an expert Sign up

`var user = require('.../models/user');

// GET /register
router.get('/register', function(req, res, next) {
 return res.render('register', { title: 'Sign Up' });
});

// POST /register
router.post('/register', function(req, res, next) {
 if (req.body.email < 16
 req.body.name < 6
 req.body.favoriteBook < 1
 req.body.password < 6
 req.body.confirmPassword < 6
) {
 // confirm that user typed same password twice
 if (req.body.password !== req.body.confirmPassword) {
 var err = new Error('Passwords do not match');
 err.status = 400;
 return next(err);
 }
 }

 // create user object with form input
 var userData = {
 email: req.body.email,
 name: req.body.name,
 favoriteBook: req.body.favoriteBook,
 password: req.body.password,
 confirmPassword: req.body.confirmPassword
 };
 user.save(function(err) {
 if (err) {
 return next(err);
 }
 res.redirect('/');
 });
});`

SEND 500 SMS FOR FREE
WHEN YOU SIGN UP BEFORE SEPT 12TH

**Build SMS applications in the
programming language you love.**

Try Twilio today >_

[Learn more about Twilio SMS](#)

Today's Focus

By the End of Today's Class:



Brainstorm possible project ideas.



Begin data research.



Write a description of the scope of your research.

By the End of Today's Class:

Create a short, 1-page project proposal that covers the following:



Project Title



Team Members



Project Description/Outline



Research Questions to Answer



Datasets to Be Used



Rough Breakdown of Tasks



Questions?