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Tech Treks

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Web Development with Flask

Welcome!

- ROI leads the industry in designing and delivering customized technology and management training solutions
- Meet your instructor
  - Name
  - Background
  - Contact info
- Let's get started!

Session Objectives

In this session, you will:

- Learn the fundamentals of how websites work
- Use the Flask module to build a simple website using Python
- Learn the differences between web pages and web services

Session Concepts

Web Basics

Flask

How Does the Web Work?

- The web works by having a server run some code
  - Can be any language; Java, JavaScript, ASP.NET, Perl, and Python are common languages for web development
- The server has a public IP address that is usually mapped to a named URL
  - www.google.com is the URL but the DNS is routed to an IP address such as 142.250.184.4
  - There is also a port that it monitors; 80 is the default but it can be changed
- When someone navigates to a URL in a browser, they are using the HTTP protocol to send a request to the software running on that server which then runs the code and returns a result

`curl`

- We typically use a browser to navigate to a URL that returns a web page
- Sometimes it’s useful to navigate to a site from the command line instead, especially during development
- `curl` is a utility that allows us to make these requests and send additional parameters
- Basic syntax would look like this:
  - `curl localhost:8000`
  - `curl -d "title=curl" -X POST http://localhost:8000/todo`

HTML and Web Pages

- The code that runs on the server can return HTML formatted string content which contains formatting commands along with the content, which is meant to make it easy for humans to read
- HTML uses tags such as `<b>bold</b>`, `<body>My content</body>`, and many more
    - We won't do a deep dive into HTML here

JSON and Web Services

- In addition to web pages, a website may run code that is called as a web service
- The main difference is that a web service doesn’t return HTML meant for human eyes, but instead returns JSON or sometimes XML
- These formats focus on returning the data without visual formatting that makes it easier for other computer programs to read the data
- Web services are the main way computers can send, request, and share information among one another

Python Web Development

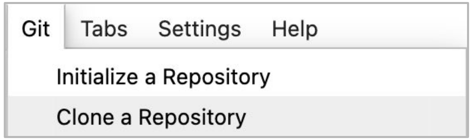
- Python is one of the more common languages to develop websites with but to do this, we need some additional modules
- There are many alternatives to choose from in the Python ecosystem
  - **Flask** is one of most common and easiest to use
  - **Django** is a bit more complex but better suited to a more comprehensive approach to building complex web-based apps
  - **Jinja** is a common templating library to help with formatting
  - **Beautiful Soup** is a common library used for parsing XML for doing things like web scraping type applications

Flask

- We will discuss Flask and use it to build a website that has both web pages and web services
- Basically, we will write a lot of Python functions to handle different kinds of requests
- We will learn how to route different requests to these functions and pass parameters to them
- These functions will do some work and either return HTML if its a web page, or JSON if its meant to be a web service
- The Flask app will run in the background as an infinite loop waiting for request from a browser or `curl` statement

Jupyter Notebook

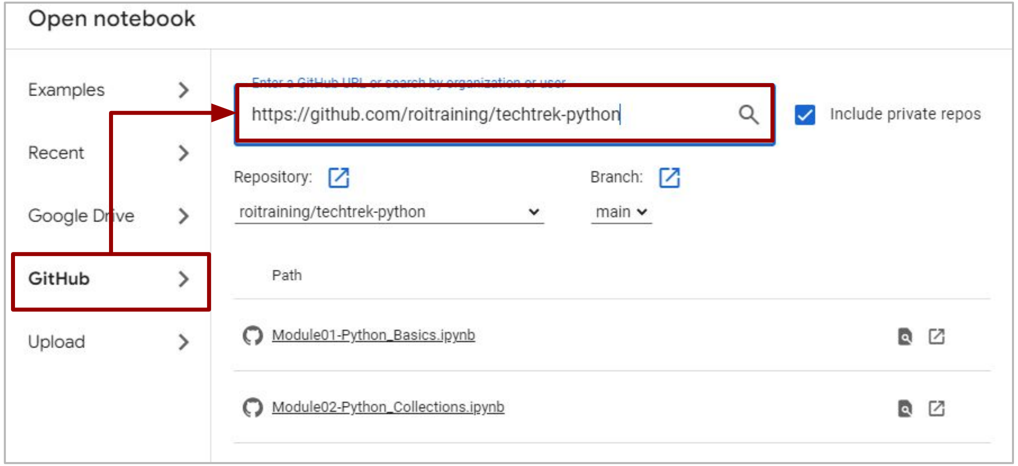
- Jupyter Notebook is perhaps the easiest way to get started with Python
- Let's start a Jupyter session by navigating to: https://notebooks.roitraining.com/
- Select the link nearest to your location
- From the top menu, choose **Git | Clone a Repository** and enter: `https://github.com/roitraining/techtrek-python`
  - Sometimes, you may need to add `.git` to the end
- Click the `Module03-Python_WebDevelopment.ipynb`



Note: The Notebook server will only be available during class and one hour afterward.

After Class

- To access the Notebook server after class, go to: https://colab.research.google.com/
- Select **GitHub** and enter **`https://github.com/roitraining/techtrek-python`**
- You must have a Google-compatible email account to log in



Open notebook

Enter a GitHub URL or search by organization or user: https://github.com/roitraining/techtrek-python

☑ Include private repos

Repository: roitraining/techtrek-python

Branch: main

Path

Module01-Python_Basics.ipynb

Module02-Python_Collections.ipynb

Session Summary

In this session, you have:

- Learned the fundamentals of how websites work
- Used the Flask module to build a simple website using Python
- Learned the differences between web pages and web services

Discussion: Recap