BugHub

Data Pipeline and Knowledge Graph
For
StackOverflow & GitHub
Team Collaboration

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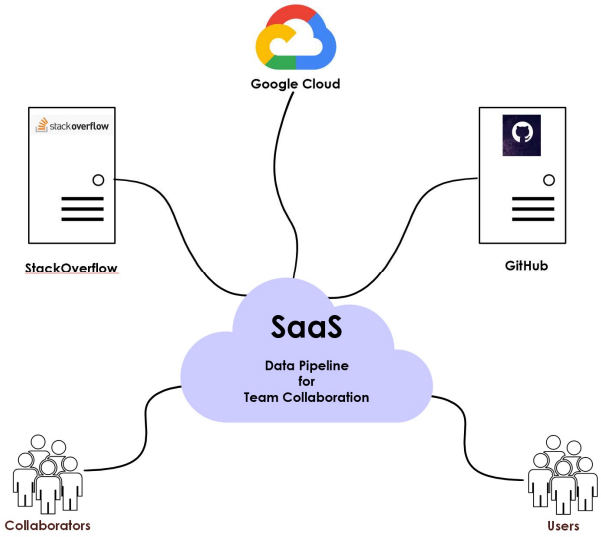
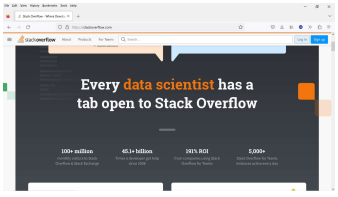
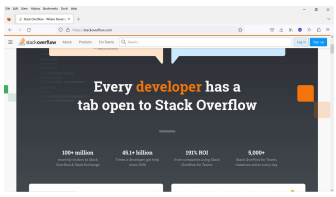
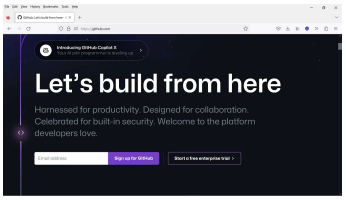
Last Edit: 4/11/2023









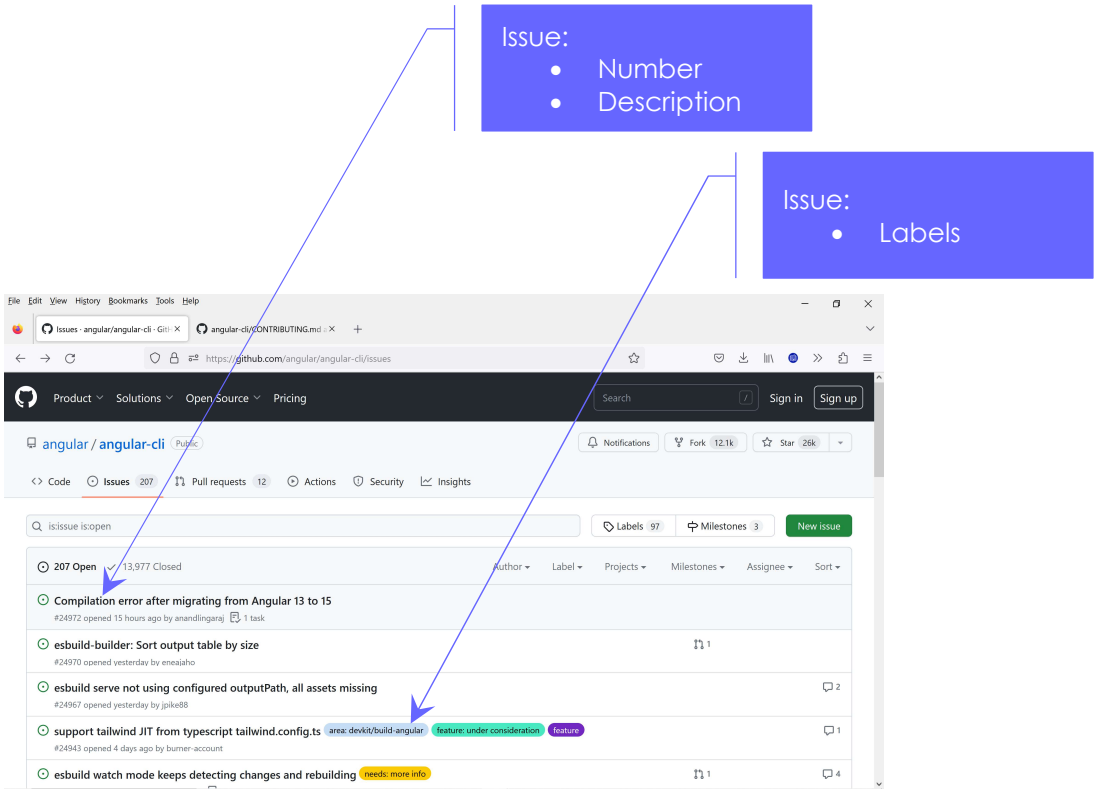
Your Task is to use **GitHub** and **StackOverflow** data to create the data pipeline and the Knowledge Graph for **BugHub**

Project Overview Statement:

StackOverflow and **GitHub** decided to join forces to start a new SaaS (Software as a Service) data pipeline for the **BugHub** project to build the platform of the future for Team Collaboration and Knowledge Sharing.

The challenge for the **Repos' Contributors** is how to distinguish between a **general question** vs. a **bug**.

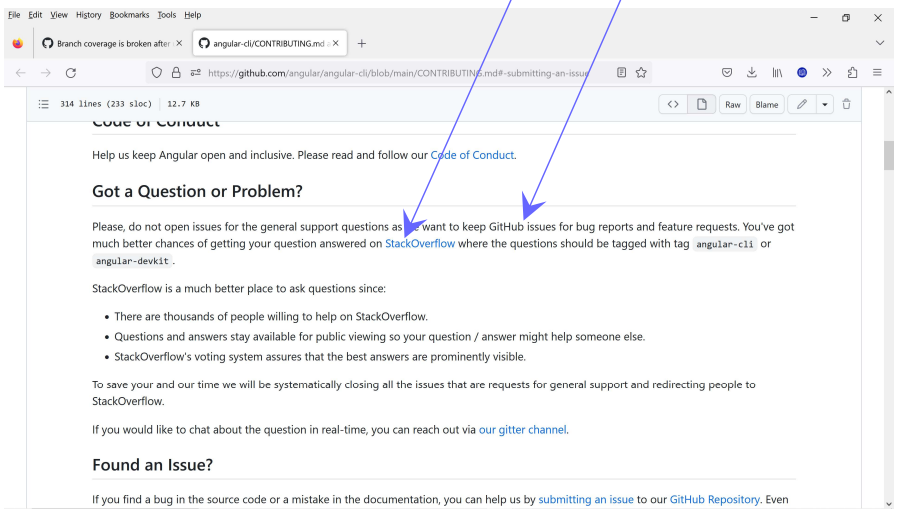
When you find a **bug** in a release, you open an **issue** on **GitHub**, and the **issue** will have a **number** and **labels** associated with it, see below an example:



GitHub Repos' Contributors urge users to check **StackOverflow** for general questions before opening an **issue** on **GitHub**

StackOverflow for:
- General Questions
- Answers

GitHub Issues for:
- Bug Reports
- Feature Request

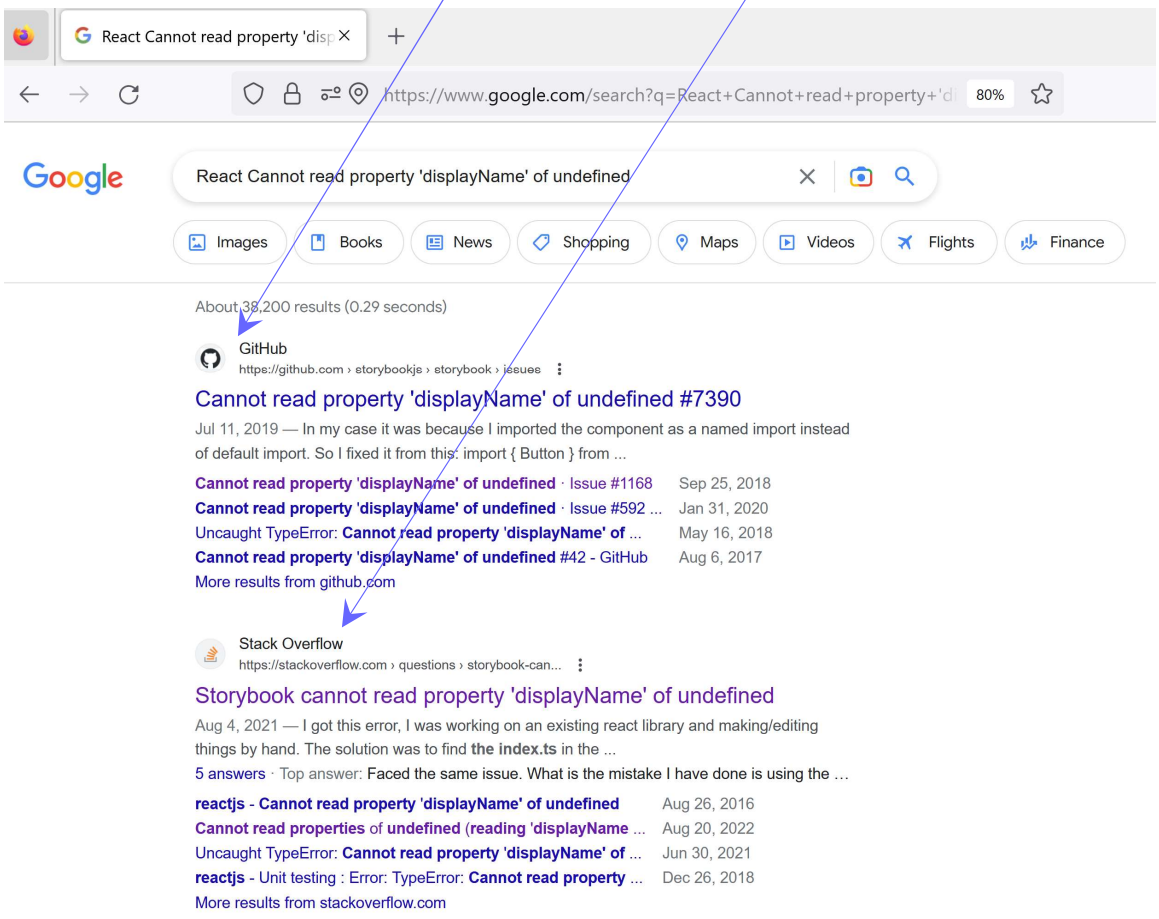


Use **Google** to search for the following error:

React Cannot read property 'displayName' of undefined

Google found it on:
- GitHub

Google found it on:
- StackOverflow



For this pilot project, imagine that **StackOverflow** and **GitHub** have contacted you to help them to develop a **data pipeline** to pull data from their servers concurrently and **cross-reference** the questions/answers/tags of StackOverflow to GitHub Repos/Branches/Issues/Labels/contributes/releases/etc.

The **data pipeline** will be used to collect the raw data from **StackOverflow** and **GitGub** and the data will be ingested from the two data sources into the data store. Before data flows into the data store, it will go through data preparation and preprocessing to filter and aggregate the data from the two data sources.

The data received from the two data sources will be processed and stored in EdgeDB as follows:

- **GitHub** data for the different **Repos** will be stored in **EdgeDB**
- **StackOverflow** data (Questions, Answers, Tags, etc.) will be stored in **EdgeDB**
- **BugHub** will have **GitHub Repo** data and attached to it **StackOverflow** data stored in **EdgeDB**

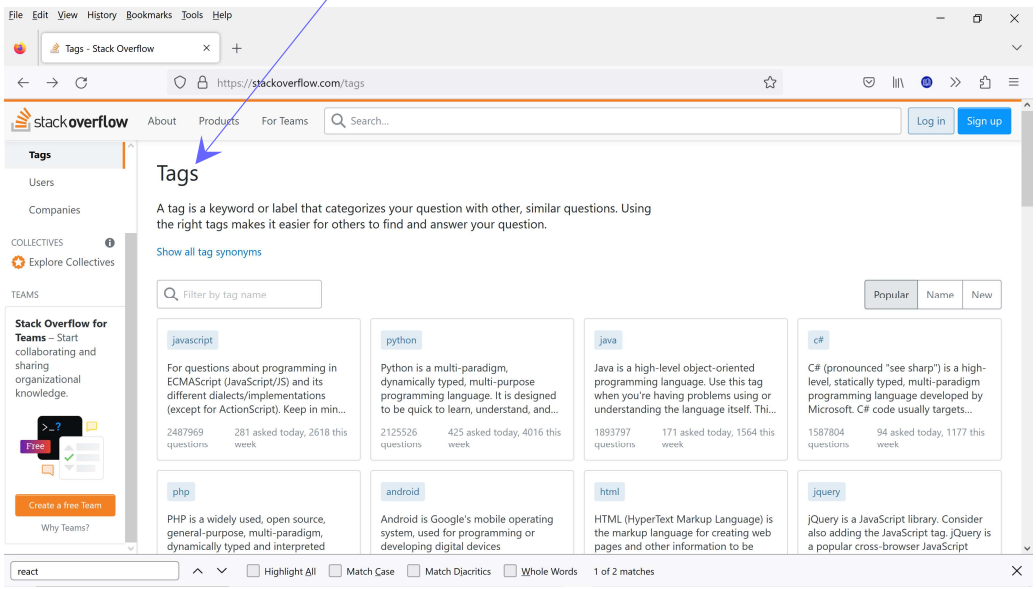
Online Documentations and Resources

After you review and analyze the documentation for **GitHub**, **Git,** and **StackOverflow** using the online educational resources listed below, provide your answers for the requirements listed in the **Requirements Specification** section below.

- https://docs.github.com/en
- https://pygithub.readthedocs.io/en/latest/introduction.html
- https://github.com/sks444/Pygithub-Examples/blob/master/get_repositories_details.py
- https://github.com/sks444/Pygithub-Examples/blob/master/get_issues_details.py
- https://networkx.org/documentation/stable/tutorial.html#
- https://docs.github.com/en/get-started/quickstart/hello-world
- https://docs.github.com/en/get-started/quickstart/git-and-github-learning-resources
- https://docs.github.com/en/get-started/quickstart
- https://docs.github.com/en/get-started/quickstart/git-cheatsheet
- https://docs.github.com/en/get-started/quickstart/be-social
- https://docs.github.com/en/get-started/quickstart/github-flow
- https://docs.github.com/en/get-started/quickstart/communicating-on-github
- https://docs.github.com/en/account-and-profile/setting-up-and-managing-your-personal-account-on-github/managing-personal-account-settings/about-your-personal-dashboard
- https://docs.github.com/en/get-started/quickstart/be-social
- https://docs.github.com/en/get-started/quickstart/github-glossary
- https://stackoverflow.com/tags

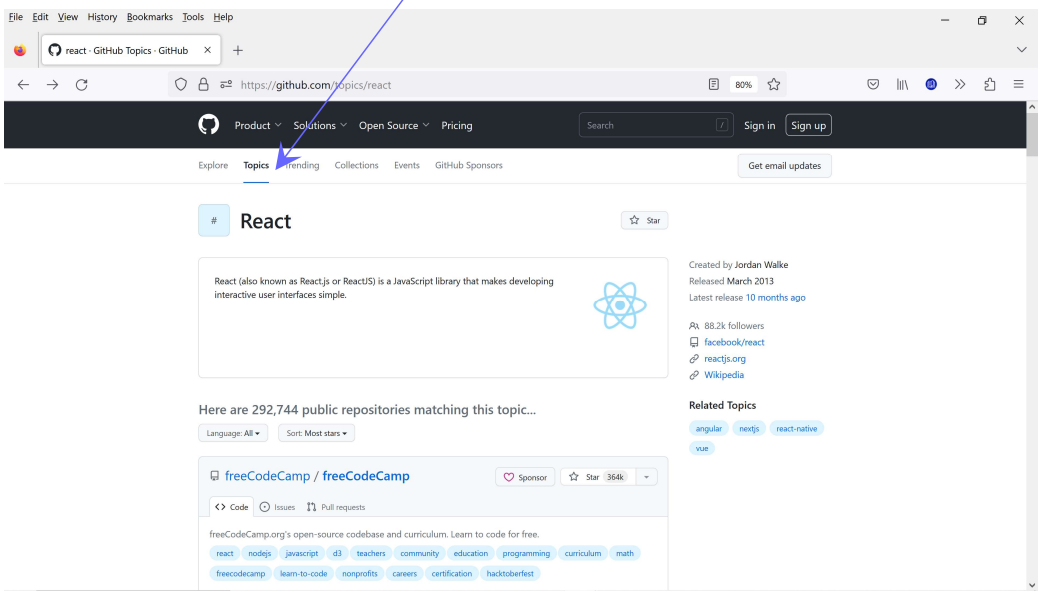
StackOverflow :

- Tags



GitHub :

- Topics
- Repos



Requirements:

Provide your answers for the following requirements:

1. List all objects, properties and links that are needed to represent the **graph data model** of the knowledge graph of **GitHub** topics, tags, repositories, and issues.

2. List all objects, properties and links that are needed to represent the **graph data model** of the knowledge graph of **StackOverflow** tags, questions, and answers.

3. Use **networkx** package to create the **graph data model** of the knowledge graph (Network) for **GitHub**
    i. https://networkx.org/documentation/stable/install.html

4. Use **networkx** package to create the **graph data model** of the knowledge graph (Network) for **StackOverflow**
    i. https://networkx.org/documentation/stable/install.html

5. Use **networkx** package to create the **graph data model** of the knowledge graph (Network) for the combined data, we will call it the the **BugHub** knowledge graph, of **GitHub** and **StackOverflow**
    i. https://networkx.org/documentation/stable/install.html

6. Write Python code (Use the **APIs** for **StackOverflow** and **GitHub**) to retrieve the data for **GitHub** and **StackOverflow** based on the knowledge graphs you created in Requirements 1, 2, 3, 4, and 5:
    a. https://github.com/topics/react
        i. https://github.com/facebook/react
        ii. https://stackoverflow.com/questions/tagged/reactjs

b. https://github.com/topics/angular
    i. https://github.com/angular/angular
    ii. https://stackoverflow.com/questions/tagged/angular

c. https://github.com/topics/visualization
    i. https://github.com/d3/d3
    ii. https://stackoverflow.com/questions/tagged/d3.js

7. Use **networkx** package to create the knowledge graph (Network) for every repo listed in requirement 6.

8. Go to **GitHub** and **StackOverflow** and inspect the following **topics**, **repos,** and **tags** and document the most relevant **repos** and **tags** for every topic:
    a. https://github.com/topics/react
        i. https://github.com/facebook/react
        ii. https://stackoverflow.com/questions/tagged/reactjs

    b. https://github.com/topics/angular
        i. https://github.com/angular/angular
        ii. https://stackoverflow.com/questions/tagged/angular

    c. https://github.com/topics/visualization
        i. https://github.com/d3/d3
        ii. https://stackoverflow.com/questions/tagged/d3.js

9. Use **GitHub API** to retrieve information of the past 2 years for the following repositories:
    1. https://github.com/angular/angular
    2. https://github.com/angular/material
    3. https://github.com/angular/angular-cli
    4. https://github.com/SebastianM/angular-google-maps
    5. https://github.com/d3/d3
    6. https://github.com/facebook/react

7. https://github.com/tensorflow/tensorflow
8. https://github.com/keras-team/keras
9. https://github.com/pallets/flask

10. Use **StackOverflow API** to retrieve information of the past 2 years for **Tags** related to the repositories listed in requirement 9.

11. Store your **GitHub** data in a DataFrame and retrieve from the DataFrame the **repo** that has the highest number of **GitHub** issues created.

12. Store your **StackOverflow** data in a DataFrame and retrieve from the DataFrame the **repo/tag** that has the highest number of **StackOverflow** questions created.

13. Store your **StackOverflow** data in a DataFrame and retrieve from the DataFrame the top 5 questions for **React** on **StackOverflow** that have the highest number of answers, votes, and views.

14. Use **EdgeQL/GraphQL** to create the complete object-relational data model for **GitHub** in **EdgeDB** using the **GitHub** data

15. Use **EdgeQL/GraphQL** to create the complete object-relational data model for **StackOverflow** in **EdgeDB** using the **StackOverflow** data

16. Use **EdgeQL/GraphQL** to create the complete object-relational data model for **BugHub** in **EdgeDB** using the combined **GitHub** and **StackOverflow** data; consider the following partial list of objects/attributes, it is your responsibility to provide the complete list of objects/properties/links:
    - git
    - GitHub
    - Repository
    - Project
    - Wiki

- Pulse
- Graph
- Code
- Issue
- commit
- branch
- clone
- remote
- fork
- pull
- log
- merge
- push
- status
- Tag
- Release
- histroy
- File
- General Comment
- Line Comment
- Review
- User Account
- Organization Account
- README.md
- CONTRIBUTING.md
- ISSUE_TEMPLATE.md
- System Configuration
- Global Configuration
- Local Configuration
- Etc.

17. Use **EdgeDB UI** to demonstrate how **StackOverflow** data (questions/answers/tags/etc) for the following tags/topics/repos are attached to **GitHub** repos in your **BugHub** object-relational database application:
    d. https://github.com/topics/react
        i. https://github.com/facebook/react
        ii. https://stackoverflow.com/questions/tagged/reactjs

    e. https://github.com/topics/angular
        i. https://github.com/angular/angular
        ii. https://stackoverflow.com/questions/tagged/angular

    f. https://github.com/topics/visualization
        i. https://github.com/d3/d3
        ii. https://stackoverflow.com/questions/tagged/d3.js

18. Use **EdgeQL/GraphQL** and **BugHub EdgeDB** to retrieve the repo that has the highest number of **GitHub** issues created.

19. Use **EdgeQL/GraphQL** and **BugHub EdgeDB** to retrieve the repo that has the highest number of **StackOverflow** questions created.

20. Use **EdgeQL/GraphQL** and **BugHub EdgeDB** to retrieve the top 5 questions for **React** on **StackOverflow** that have the highest number of answers, votes, and views.