TechTrek Developer Handbook

Introduction

This developer handbook was created to ensure a smooth and enjoyable experience during the upcoming TechTrek. It contains recommendations on the skills and technologies beneficial to you during the TechTrek.

*Note: Other than **required** skills, the other recommendations serve as a guide and not indicators of the assessment criteria. Feel free to work on the tech stack that you are comfortable with. Although only web development technologies are included, native development is welcome too.

Please ensure that the required setup have been installed into your laptops beforehand.

Required Setup

The TechTrek will be attempted on your personal computer so please make sure that you are able to install selected technologies and troubleshoot ahead of the TechTrek.

Technologies you should setup on your computer:

- Nodejs with ExpressJs and ReactJs
- Python with Flask
- Git
- Postman
- MySQL

Optional Technologies

- Github Desktop (GUI)
- HediSQL (GUI)
- Anaconda

Web Development

Frontend Development

Frontend development is the development of the graphical user interface where users view and interact with the website's content. Using only HTML, CSS, and JavaScript is possible but the use of a frontend library or framework is preferred. In this case, we recommend the **React** library for JavaScript.

*Note: Frameworks like Angular and Vue.js can also be used but **React** is recommended because of its ease of use. Within React, **functional** components are **preferred** to class components.

Required Concepts

- HTML, CSS, JavaScript
- Display webpage, Basic design
- API call
- Authentication

Recommended

- React
  - React Documentation
  - Tutorial

- Axios
  - Axios Documentation
  - Axios HTTP Post Request Examples
  - Tutorial

Backend Development

Backend development handles everything the user does not see and contains the backbone of the application. It handles the logic behind the actions performed on a website, focusing mainly on databases, servers, etc.

*Note: We recommend using either the **Express** or **Flask** frameworks as they are lightweight and easy to implement.

Required

- Backend language
  - JavaScript (Node.js)
  - Python
- APIs
- CRUD operations
- Basic Authentication

Recommended Backend

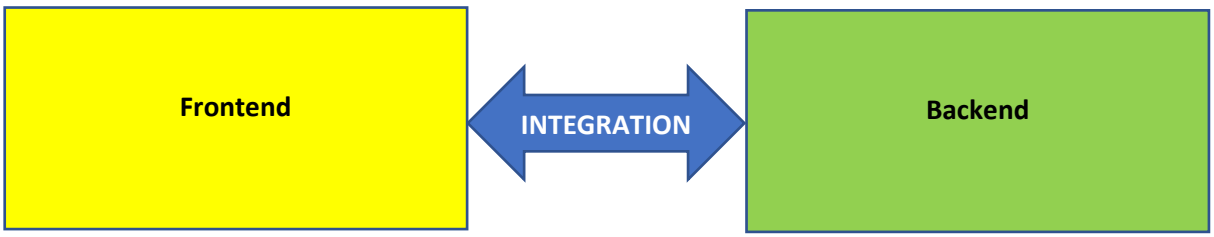
- Express
  - Express Documentation
  - Tutorial
- Flask
  - Flask Documentation
  - Tutorial

Recommended Data Management

- SQL
  - MySQL
- NoSQL
  - MongoDB

Integration

For any application, integrating the frontend and backend has always been tedious. However, to create a functioning application, it is important to ensure that information flows smoothly from the web-page to the database. This section will provide you with some ideas and tools to help with the integration.



Local host integration is the minimum requirement. Additional integration i.e. Integrating into the cloud is optional and up to your own discretion.

*Note: We recommend using either the **Express** or **Flask** frameworks for backend, as well as **React** for the frontend as they are lightweight and easy to implement.

Required Local Integration

- Backend language
  - JavaScript (Node.js)
  - Python
- Frontend
  - React
  - Axios
- Understanding localhost

Concepts:

- Express + React
  - Tutorial 1
  - Tutorial 2
- Flask + React
  - Tutorial 1
  - Tutorial 2

General

Tools

Here are some tools that you will find useful for the TechTrek.

Version Control

Version control is the practice of tracking and managing changes to software code and is integral to any project, big or small. This is especially important with multiple collaborators where overlapping or conflicting changes should be resolved before the source code is changed. It is **HIGHLY RECOMMENDED** to push your commits frequently. Smaller commits help to keep the software code updated, while minimizing the issues of git conflicts when working in a team.

*Note: Groups will be required to create and maintain a GitHub repository for the TechTrek.

Required

- Git
  - Documentation
  - Tutorial
  - Managing Git

Team Collaboration

Communication will be the key to success in this TechTrek as with all collaborative work. To ensure a pleasant experience for all participants please be respectful to one another and talk through any concerns with the team. Along with that, here are some tools to facilitate smoother collaboration. **Please note that for a successful integration, team collaboration and communication between the backend and frontend teams needs to be regular throughout the hackathon.**

Recommended but not compulsory

- Documentation
  - Google Docs
- Wireframing
  - Sketch
  - Figma
  - Adobe

Team Presentation

Presenting your work and ideas are the next important element in this hackathon. This is also a key part of the assessment and in this section, tips will be provided to guide you on some presentation skill and structure. Note that these are recommendations, and we welcome other structures or methods that value-add to your project as a whole.

1) **Focus on the why instead of the what.** Ensure you are able to express your viewpoints on why certain tech stack/technologies are used and why not the others.
2) Keep your presentation concise and clean while ensuring you have strong substance in your content.
3) If you have too many exciting points to share, make sure you start off with the **most impactful points** as this is to ensure you can make use of the time well and effectively.
4) PRIDE values, especially Decisive, Relationship-led and Purpose Driven are key during the presentation as well as throughout the hackathon. Consider methods on how you can display these values and imbibe them into your actions during the hackathon.

Application Development and Support (Advanced)[1]

Additional areas to look at for Application Development involves understanding how project planning for application development happens, as well as how application support occurs postproduction. To showcase your knowledge in this pillar, we recommend you understand the following concepts.

Suggested Exploration:

- Security
  - Basic Web Security
- Requirements & Resource management
- Cost of Production
  - Cost of Production
- Timeline
- Postproduction support
  - Graceful Degradation
  - Handling Upgrades

Note:
Remember that these are guidelines for those who have little understanding in this area. You should ideally do your own research and have a good understanding of this pillar if you wish to showcase your knowledge here.

[1] These are advanced skills and meant for you to showcase your domain knowledge. The knowledge shared within the handbook is only meant to start your own self-exploration, and you are expected to do your own research and analysis if you wish to showcase your domain knowledge in this field.

DevOps and Site-Reliability Engineering (Advanced)[2]

As a DevOps and Site-Reliability Engineering (SRE) specialist, you should have sufficient knowledge in DevOps and SRE principles. Concepts such as Downtime, Accessibility, risk acceptance and mitigation must be properly understood. Below are some links that introduce the basics of these concepts.

Suggested Exploration:

DevOps and SRE Basic Knowledge:

- 5 SRE Principles
- Error Budgeting
- Downtime

Note:
Remember that these are guidelines for those who have little understanding in this area. You should ideally do your own research and have a good understanding of this pillar if you wish to showcase your knowledge here.

[2] These are advanced skills and meant for you to showcase your domain knowledge. The knowledge shared within the handbook is only meant to start your own self-exploration, and you are expected to do your own research and analysis if you wish to showcase your domain knowledge in this field.