1. Creating a GitHub Account

Explanation:

- **GitHub** is an online platform for hosting and collaborating on code. It's especially popular for open-source projects and for version control using **Git**.
- Creating a GitHub account allows you to store code online, collaborate with others, and maintain a project portfolio.

Steps:

1. Go to GitHub.
2. Click **Sign up** and fill in the details.
3. Verify your email and log in.

Example:

Imagine you're working on a website with a team. Instead of emailing files back and forth, you all push updates to GitHub, which keeps track of who made changes and when.

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2. Setting Up the Project Folder and Git Initialization

Explanation:

- **Git** is a tool that lets you track changes to files over time. When you initialize a Git repository, you enable Git to start tracking files and changes within the folder.
- **Folder Naming**: To avoid confusion, name the local folder the same as the repository name on GitHub.

Steps:

1. On your computer, create a folder, e.g., `MyWebsiteProject`.
2. Open a terminal in that folder.
3. Run the command `git init`. This command initializes the folder as a Git repository.

```
mkdir MyWebsiteProject
cd MyWebsiteProject
git init
```

Example:

In a brand-new folder called `MyWebsiteProject`, if you create an `index.html` file, Git will be able to track every change made to this file, like adding or removing content.

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3. Understanding Repositories

Explanation:

- A **repository (repo)** is a container for a project's files and history. It stores your code and tracks changes made over time.
- Repositories can be hosted locally (on your computer) or remotely (like on GitHub).

Steps to Create a GitHub Repository:

1. Go to GitHub, click on **New Repository**.
2. Name it `MyWebsiteProject` (or something similar).
3. Choose whether it should be public or private.
4. Do **not** initialize with a README or .gitignore for now.
5. Click **Create Repository** and copy the URL for later.

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4. Adding a Remote Origin

Explanation:

- A **remote** is a version of the repository hosted on GitHub. The **origin** remote points to this GitHub repository and enables you to push changes from your local repo to GitHub.
- Think of the **remote origin** as the official "cloud copy" of your project.

Command:

```
git remote add origin <repository_url>
```

Example:

If your GitHub repository URL is `https://github.com/username/MyWebsiteProject.git`, you would run:

```
git remote add origin https://github.com/username/MyWebsiteProject.git
```

Now, when you push changes, Git will know to send them to this GitHub repository.

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5. Staging, Committing, and Pushing Changes

Explanation:

- **Staging** is like gathering changes you want to include in the next snapshot.
- **Commit** is creating a snapshot of the staged changes, permanently saved in the Git history.
- **Push** is sending these commits to the GitHub repository.

Steps:

1. **Create a file**: Open `index.html` and add some basic HTML structure.
2. **Stage the file**:

   ```
   git add index.html
   ```

   - This prepares `index.html` to be included in the next commit.
3. **Commit the changes**:

   ```
   git commit -m "Initial commit with index.html"
   ```

   - This records the change, with a message describing what you did.
4. **Push to GitHub**:

   ```
   git push origin main
   ```

Example:

You create an `index.html` with the text “Hello World!”. You run `git add index.html` (staging), `git commit -m "Added index.html"` (commit), and `git push origin main` (push).

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6. Hard and Soft Reset

Explanation:

- **Soft reset**: Moves the commit pointer but keeps changes in the staging area (useful if you want to re-commit with a different message).
- **Hard reset**: Moves the commit pointer and deletes all changes after that commit (use cautiously as it permanently deletes changes).

Commands:

1. **Soft Reset**:

   ```
   git reset --soft <commit_hash>
   ```

2. **Hard Reset**:

   ```
   git reset --hard <commit_hash>
   ```

Example:

If you’ve made three commits, and you want to undo the last one:

- Soft reset keeps the changes but removes the commit.
- Hard reset deletes the changes entirely.

7. Forking and Cloning a Repository

Explanation:

- **Fork**: A personal copy of someone else's repository, allowing you to experiment without affecting the original.
- **Clone**: A copy of any repository to your local machine.

Steps:

1. Go to a public repository and click **Fork**.
2. Copy the forked repository URL and run:

```
git clone <repository_url>
```

Example:

Fork a popular open-source project on GitHub and clone it to your computer to start making changes locally.

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8. Making Changes in the Forked Repository

Explanation:

- You can modify your forked repository independently, make changes, and push them to your fork.
- **Merging**: If the original repository owner accepts your changes, they can merge them.

Example Activity:

1. Add a file named `contribution.txt` with a note about what you changed.
2. Stage, commit, and push the file to your forked repository.

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9. Creating and Working with Branches

Explanation:

- A **branch** is a separate version of the project where you can work on new features or changes without affecting the main code.
- **Why Branches?** They allow you to experiment without breaking the main code, useful for feature development or bug fixing.

Steps:

1. Create and switch to a new branch:

```
git checkout -b new-feature
```

2. After making changes, commit and push the branch:

```
git push origin new-feature
```

Example:

Create a branch for a new feature (like `dark-mode`). Work on this feature without affecting the main code. Once complete, merge it back into the main branch.

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10. GitHub Student Developer Pack and Resources

Explanation:

- GitHub offers a **Student Developer Pack** with free or discounted access to various developer tools, ideal for students looking to expand their skills.
- **Notable Resources**: Free hosting, cloud credits, IDEs, and online courses.

Steps to Apply:

1. Visit the GitHub Education page.
2. Click on **Get benefits** and verify with your student credentials.

Examples of Tools:

- Free hosting on Heroku
- Microsoft Azure credits
- JetBrains IDEs

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11. Wrap-Up and Q&A

Summary Points:

- Git is essential for tracking changes and collaborating.
- GitHub extends Git's functionality with cloud storage and collaboration features.
- GitHub Student Developer Pack provides valuable tools to boost development skills.