**Embedded Systems**
*Engr. Jobert DC. Cadiz*

| *Prelim Period*<br><br>**AC** | **Activity#5: Introduction to Git & GitHub - Version Control**<br><br>*Members:* Altiche, Angsioco, Anhao, Artagame, Castronero<br>*Group Number:* 4        *Section:* COM801 | *Grade* |
|---|---|---|

**I - Objectives:**
1. Understand the importance of Git and GitHub in software development.
2. Learn how to set up Git on a Windows machine.
3. Practice cloning, committing, pushing, and pulling changes in a GitHub repository.
4. Apply version control to store and track ESP32 activities/projects.

**II – What is Git & GitHub?**
- Git is a tool that tracks changes in your code and allows you to collaborate with others.
- GitHub is an online platform where you can store, share, and manage your Git repositories.

**III – Setting Up Git on Windows**
1. Install Git
    1.1. Download Git for Windows
    1.2. Run the installer and keep the default settings.
    1.3. After installation, restart your computer (if necessary).
    1.4. Open Command Prompt (cmd) or Git Bash and type:
    **git --version**

    If you see something like git version 2.x.x, Git is successfully installed!

2. Create a GitHub Account
    2.1. Go to GitHub and sign up if you don't have an account.
    2.2. Verify your email and log in.

3. Configure Git on Your Computer
    Before using Git, we need to tell it who you are:
    3.1. Open Git Bash (or Command Prompt).
    3.2. Set your username (replace "Your Name" with your real name):
    **git config --global user.name "Your Name"**

    3.3. Set your email (use the same email as your GitHub account):
    **git config --global user.email "your@email.com"**

    3.4. Check if Git saved your details:
    **git config --list**

There are only 10 types of people in the world: those who understand binary and those who don't.

If you see your name and email, you're good to go!

4. Create a New GitHub Repository
    4.1. Go to GitHub.
    4.2. Click New Repository (or + > New Repository).
    4.3. Name it "ESP32-PWM-Project" (or anything you like).
    4.4. Select "Public" and check "Add a README file".
    4.5. Click Create Repository.

    You now have an empty project ready!

5. Clone Your Repository to Your Computer
    Cloning means downloading the project to your PC so you can edit it.
    5.1. Copy the repository link from GitHub (click the "Code" button).
    5.2. In Git Bash (or Command Prompt), go to a folder where you want to save your project:
        **cd Documents**

    5.3. Clone the repo:
        **git clone https://github.com/yourusername/ESP32-PWM-Project.git**

    5.4. Open the cloned folder:
        **cd ESP32-PWM-Project**

    Your project is now on your PC!

6. Add Your ESP32 Code to GitHub
    Now, let's save your ESP32 PWM servo code into GitHub.
    6.1. Copy your PAct4 ESP32 servo project files into the cloned folder (ESP32-PWM-Project).
    6.2. Go back to Git Bash (inside the project folder).
    6.3. Check which files are new or changed:
        **git status**
    6.4. Add all files to Git tracking:
        **git add .**
    6.5. Commit the changes with a message:
        **git commit -m "Added ESP32 PWM Servo Project"**
    6.6. Push the files to GitHub:
        **git push origin main**

    Check GitHub, and you'll see your ESP32 code uploaded!

7. Update Your Project (Pull & Push)
    If you make changes later:
    ● Check for updates from GitHub:
        **git pull origin main**
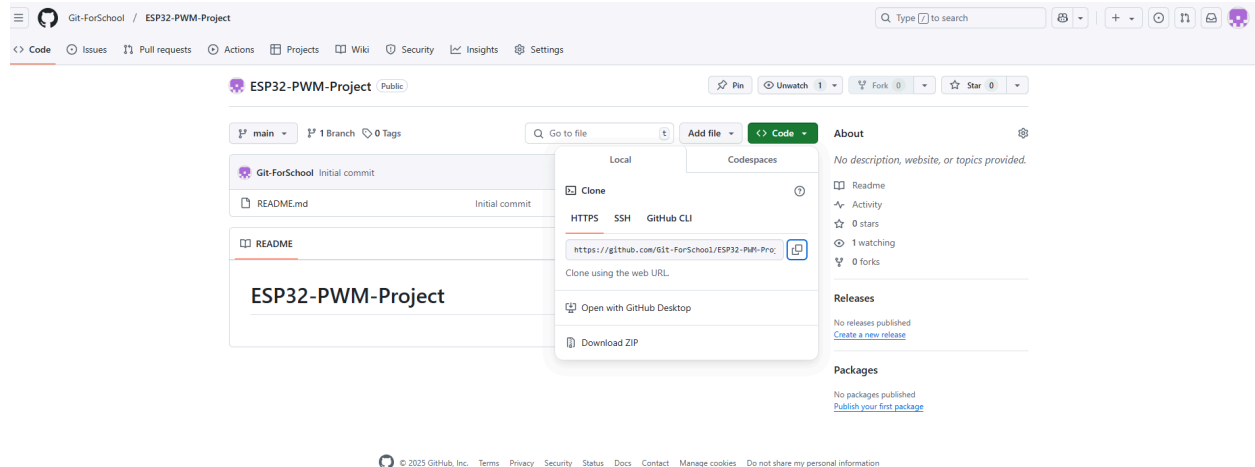    ● After editing files, save them with Git:
        **git add .**

**"STUDY AND PRAY. ALWAYS PUT GOD FIRST"…**

**git commit -m "Updated PWM angle control"**
**git push origin main**

This keeps your project up-to-date on GitHub! 🎯

## IV - Output:
Put here your GitHub repository link and screenshot

https://github.com/Git-ForSchool/ESP32-PWM-Project.git

## V - Expected Output
- Your ESP32 PWM servo project is stored safely on GitHub.
- You can access and modify it from any computer.
- You've learned Git commands to manage your project.

## VI - Summary of Git Commands

| Command | What It Does |
|---------|--------------|
| git --version | Check if Git is installed |
| git config --global user.name "Your Name" | Set your Git username |
| git config --global user.email | Set your Git email |
| git clone <repo-link> | Download a project from GitHub |
| git status | Check which files changed |
| git add . | Add all changes to Git |
| git commit -m "message" | Save changes with a message |

There are only 10 types of people in the world: those who understand binary and those who don't.

| git push origin main | Upload changes to GitHub |
| --- | --- |
| git pull origin main | Download the latest version from GitHub |

**Congratulations! You now know how to use Git & GitHub for Embedded Systems!**

**VII - Conclusion**

In this activity, we learned the essential concepts of Git and GitHub and their importance in software development, particularly in managing and collaborating on projects. By setting up Git on our Windows machine and creating a GitHub repository, we gained valuable experience in version control, which helps us track changes in our code, maintain a project history, and collaborate effectively with others.

We also practiced using key Git commands, such as cloning a repository, adding and committing changes, pushing updates to GitHub, and pulling the latest changes. With these skills, we can now confidently manage our ESP32 projects and collaborate with others, knowing that all our work is safely stored on GitHub and can be accessed from any device.

This activity not only strengthened our understanding of version control, but also laid the groundwork for future development in embedded systems, ensuring our projects are organized, shareable, and trackable. As we continue exploring Git and GitHub, we'll enhance our workflow and improve our overall development practices.

**"STUDY AND PRAY. ALWAYS PUT GOD FIRST"...**