

OST Project Report

Name	PRN
Ananya Patni	23070123023
Arya Shahi	23070123030
Divyansh Rastogi	23070123048
Ishaan kukade	23070123062
Jatin Gurjar	23070123067

Title: version control of Digital Dice Implementation Using git and git hub

Introduction:

This project demonstrates the design and implementation of a digital dice using a PIC18F4550 microcontroller, replicating the function of a physical dice through LED-based binary output. When a button is pressed, the microcontroller generates a pseudo-random number (1–6) and displays the result on LEDs arranged in a standard dice pattern. The system eliminates manual bias and offers a simple, reliable digital alternative. The code, written in Embedded C using MPLAB X IDE, utilizes GPIO, timer, and interrupt functions. This project serves as a cost-effective educational tool for board games, probability experiments, and classroom demonstrations.

This project illustrates the utilization of Git and GitHub for efficient version control, collaboration, and project management in creating a Digital Dice implementation on the PIC18F4550 microcontroller. Git was used to record every change made on the source code, circuit schematics, and documentation so the contributors could work in parallel without interfering with one another's work. GitHub was a remote repository that offered a central location for code hosting, issue tracking, and management of pull requests.

Every team member made their own branch for individual elements — like hardware schematics, source code, header files, and documentation — and then combined their work into the master branch via pull requests. This provided a controlled and transparent process where each update could be reviewed, tested, and versioned correctly.

By using Git and GitHub, the group attained organized collaboration, history of versions that is traceable, and effective problem-solving. The repository now has a full history of how the project evolved from the earliest commits through to the last testable version, which can be easily maintained, improved upon, or cloned in the future.

1.Tools: Git and Github

2. Programming language:

3. Contribution

S.No	Name	role/contribution	Github profile	Pull request/commits
1	Ananya Patni	Header files	https://github.com/ananyapatni	https://github.com/jatin-gurjar-enjoy/digital-dice-pic18f4550/commit/7041de5d3a048aab6c9c463d63630f1ac84854eb
2	Arya Shahi	README file	https://github.com/arya-shahi	https://github.com/jatin-gurjar-enjoy/digital-dice-pic18f4550/commit/47971b3e1d07d49b84f39039dbb6526afcebe3cd
3	Divyansh Rastogi	Hardware/schematic	https://github.com/divyansh7705705	https://github.com/jatin-gurjar-enjoy/digital-dice-pic18f4550/commit/51f1bea1c7cfd146fc61c469e6f119a657f1e282
4	Ishaan kukade	Source file	https://github.com/ishaankukade	https://github.com/jatin-gurjar-enjoy/digital-dice-pic18f4550/commit/cc49e57dd68d45020bfb9a2797f27e5f9afe4644
5	Jatin Gurjar	Issue resolve	https://github.com/jatin-gurjar-enjoy	<ul style="list-style-type: none">• https://github.com/jatin-gurjar-enjoy/digital-dice-pic18f4550/commit/3608cd27a27e6cd56e73966ec0a3fc49e9c7bb4d• https://github.com/jatin-gurjar-enjoy/digital-dice-pic18f4550/commit/24a58e774e5eb655130dd3b6a0ad40e4af592a31

4. Challenges Faced and Solved

- Timer Randomness: Initial rolls were predictable. Improved by resetting Timer0 and adding delay.
- Button Debounce: False triggers occurred. Solved using a 5 ms debounce delay.
- LED Flicker: LEDs flickered during roll. Fixed by clearing LATB before each display.
- Indicator LED Conflict: RC1 conflicted with other pins. Reassigned and added delay for startup blink.

5. Pushing the project to github

- Github repository link: [Digital Dice](#)

Issues:

1) Label: enhancement - animation for dice roll

This screenshot shows a GitHub issue titled "Add an LED rolling animation before showing the final dice number #2". The issue is labeled "enhancement" and is currently closed. It was opened by user SohamJade 3 hours ago. The description states: "it would be more attractive and fun to watch". The issue history shows that user jatin-gurjar-enjoy added the "enhancement" label 2 hours ago, self-assigned the issue 2 hours ago, linked a pull request "Enhancement: Added animation #4" 1 hour ago, and finally closed the issue as "completed" in #4 1 hour ago. The right sidebar shows the issue's metadata: Assignees (jatin-gurjar-enjoy), Labels (enhancement), Projects (No projects), Milestone (No milestone), and Relationships (None yet).

2) Label: bug - dice roll formula

This screenshot shows a GitHub issue titled "Bug: Dice Roll Calculation Formula Limits Maximum Result to 5 #1". The issue is labeled "bug" and is currently closed. It was opened by user jiyapalod 3 hours ago. The description explains the core error: "The core error in the digital dice code is that the roll calculation, $\text{dice} = (\text{Math} \times 5) + 1$, is incorrect for a six-sided die. The modulo operation (mod5) ensures the result is always 0 to 4, which, when 1 is added, limits the maximum possible dice value to 5, making it impossible to roll a 6. The fix is to change the formula to $\text{dice} = (\text{Math} \times 6) + 1$, to correctly generate a number in the 1 to 6 range." The issue history shows that user jatin-gurjar-enjoy added the "bug" label 2 hours ago, self-assigned the issue 2 hours ago, linked a pull request "Fix dice roll formula allows 1-6 #3" 1 hour ago, and closed the issue as "completed" in #3 1 hour ago. The right sidebar shows the issue's metadata: Assignees (jatin-gurjar-enjoy), Labels (bug), Projects (No projects), Milestone (No milestone), Relationships (None yet), and Development (Code with agent mode). A link to the pull request "Fix dice roll formula allows 1-6" is also visible.

6. Pull request:













1) Branch 1

The screenshot shows a GitHub pull request interface for a pull request titled "Enhancement: Added animation #4". The pull request is merged and closed. The main content area shows a commit history with a single commit by "jatin-gurjar-enjoy" titled "Enhancement: Added animation" with commit hash "2b40cb2". The commit message is "Added simple block to add animation". Below the commit history, there is a section titled "Pull request successfully merged and closed" with a "Delete branch" button. The right sidebar shows the pull request details, including "Reviewers" (No reviews), "Assignees" (No one—assign yourself), "Labels" (None yet), "Projects" (None yet), "Milestone" (No milestone), and "Development" (Successfully merging this pull request may close these issues).

2) Branch 2

The screenshot shows a GitHub pull request interface for a pull request titled "Fix: dice roll formula allows 1-6 #3". The pull request is merged and closed. The main content area shows a commit history with a single commit by "jatin-gurjar-enjoy" titled "Fix: dice roll formula allows 1-6" with commit hash "6c82586". The commit message is "Updated dice roll formula in main.c" and "Verified correct output for all dice faces". Below the commit history, there is a section titled "Pull request successfully merged and closed" with a "Delete branch" button. The right sidebar shows the pull request details, including "Reviewers" (No reviews), "Assignees" (No one—assign yourself), "Labels" (None yet), "Projects" (None yet), "Milestone" (No milestone), and "Development" (Successfully merging this pull request may close these issues).

7. Commits:

Merge pull request #4 from jatin-gurjar-enjoy/2-add-an-led-rolling-an... Pull request merge	...
 jatin-gurjar-enjoy pushed 2 commits to main • 24a58e7...3608cd2 • 1 hour ago	
Enhancement: Added animation	...
 jatin-gurjar-enjoy pushed 1 commit to 2-add-an-led-rolling-animation-before-showing-the-final-dice-number • 24a58e7...2b40cb2 • 1 hour ago	
Merge pull request #3 from jatin-gurjar-enjoy/1-bug-dice-roll-calcula... Pull request merge	...
 jatin-gurjar-enjoy created 2-add-an-led-rolling-animation-before-showing-the-final-dice-number • 24a58e7 • 1 hour ago	
Merge pull request #3 from jatin-gurjar-enjoy/1-bug-dice-roll-calcula... Pull request merge	...
 jatin-gurjar-enjoy pushed 2 commits to main • cffd9e9...24a58e7 • 1 hour ago	
Fix: dice roll formula allows 1-6	...
 jatin-gurjar-enjoy pushed 1 commit to 1-bug-dice-roll-calculation-formula-limits-maximum-result-to-5 • cffd9e9...6c82586 • 2 hours ago	
Update main.c	...
 jatin-gurjar-enjoy created 1-bug-dice-roll-calculation-formula-limits-maximum-result-to-5 • cffd9e9 • 2 hours ago	
Update main.c	...
 jatin-gurjar-enjoy pushed 1 commit to main • 7041de5...cffd9e9 • 3 hours ago	
add header files	...
 ananyapatni pushed 1 commit to main • cc49e57...7041de5 • 3 hours ago	
add source file for digitaldice program	...
 ishaankukade pushed 1 commit to main • 51f1bea...cc49e57 • 3 hours ago	
add schematic folder with circuit diagram	...
 divyansh7705 pushed 1 commit to main • 47971b3...51f1bea • 4 hours ago	
update README.md file	...
 arya-shahi pushed 1 commit to main • c25abfc...47971b3 • 5 hours ago	
Add README.md file	...
 arya-shahi created main • c25abfc • 5 hours ago	

README File: It contains all the necessary information related to the project repository which explains the objective and working of the project. It helps users understand the reason and operation of the given project.

Git commands used:

1. git init: Initialize a new Git repository
2. git add: Add all project files to staging area
3. git commit -m "initial commit" : Commit the files with a message
4. git branch -M main: Rename the default branch to 'main'
5. git remote add origin: -link- Connect the local repo to GitHub
6. git push -u origin main: Push the files to GitHub

5. Conclusion:

We successfully built a digital dice and pushed the project to the github repository. This repository contains all the documents and codes related to the project. We also modified the code to make it more efficient and add new enhancements while solving issues raised by other users.