

OST Project Report

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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/ananvapatni	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/51f1bea1c7cf146fc61c469e6f119a657f1e282
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

Add an LED rolling animation before showing the final dice number #2

Closed 4

SohamJade opened 3 hours ago

it would be more attractive and fun to watch

Create sub-issue

jatin-gurjar-enjoy added enhancement 2 hours ago

jatin-gurjar-enjoy self-assigned this 2 hours ago

jatin-gurjar-enjoy linked a pull request that will close this issue ↗ Enhacement: Added animation #4 1 hour ago

jatin-gurjar-enjoy closed this as completed in #4 1 hour ago

Assignees: jatin-gurjar-enjoy

Labels: enhancement

Projects: No projects

Milestone: No milestone

Relationships: None yet

2) Label: bug - dice roll formula

Bug: Dice Roll Calculation Formula Limits Maximum Result to 5 #1

Closed 3

jiyapalod opened 3 hours ago

The core error in the digital dice code is that the roll calculation, `dice = (TMR0 % 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 `dice = (TMR0 % 6) + 1;` to correctly generate a number in the 1 to 6 range.

Create sub-issue

jatin-gurjar-enjoy added bug 2 hours ago

jatin-gurjar-enjoy self-assigned this 2 hours ago

jatin-gurjar-enjoy linked a pull request that will close this issue ↗ Fix: dice roll formula allows 1-6 #3 1 hour ago

jatin-gurjar-enjoy closed this as completed in #3 1 hour ago

jatin-gurjar-enjoy 1 hour ago

The bug has been fixed — the dice roll formula now allows values 1–6.
A pull request has been opened to address this issue.

Owner: jatin-gurjar-enjoy

Assignees: jatin-gurjar-enjoy

Labels: bug

Projects: No projects

Milestone: No milestone

Relationships: None yet

Development: Code with agent mode

Fix: dice roll formula allows 1-6
jatin-gurjar-enjoy/digital-dice-pic18f4550

Notifications: Customize

Subscribe

6. Pull request:

1) Branch 1

Enhancement: Added animation #4

Merged jatin-gurjar-enjoy merged 1 commit into main from 2-add-an-led-rolling-animation-before-showing-the-final-dice-number 1 hour ago

Conversation 0 Commits 1 Checks 0 Files changed 1 +6 -0

jatin-gurjar-enjoy commented 1 hour ago
Added simple block to add animation

Enhancement: Added animation 2b40cb2

jatin-gurjar-enjoy linked an issue 1 hour ago that may be closed by this pull request
[Add an LED rolling animation before showing the final dice number #2](#) Closed

jatin-gurjar-enjoy merged commit 3608cd2 into main 1 hour ago Revert

Pull request successfully merged and closed Delete branch

You're all set — the 2-add-an-led-rolling-animation-before-showing-the-final-dice-number branch can be safely deleted.

Reviewers: No reviews

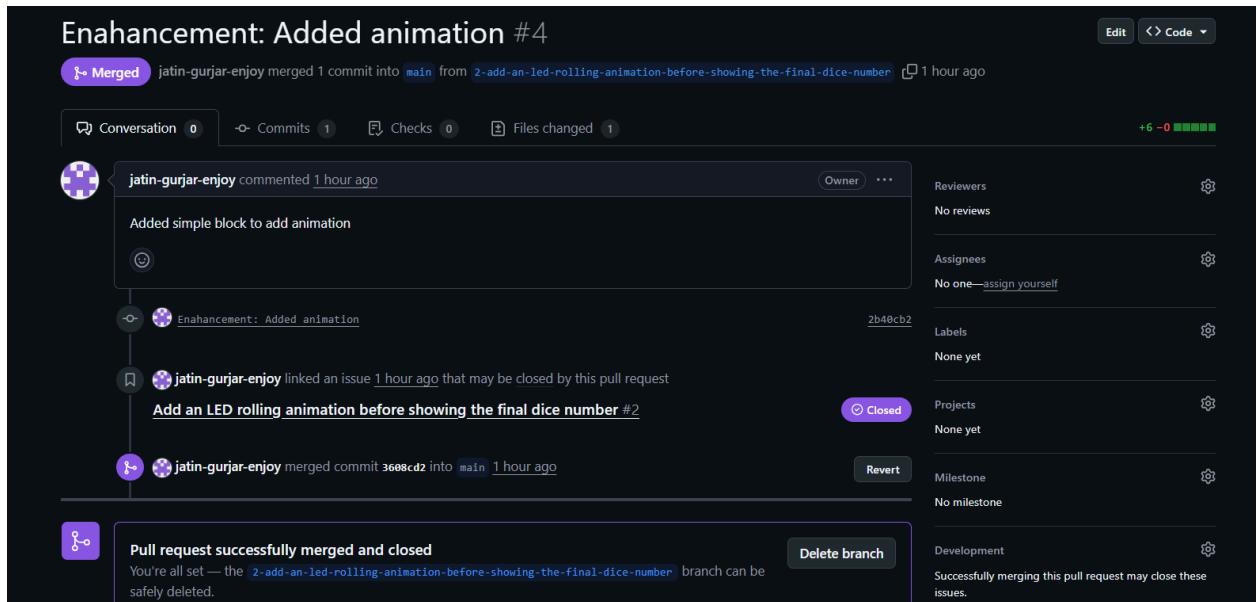
Assignees: No one—assign yourself

Labels: None yet

Projects: None yet

Milestone: No milestone

Development: Successfully merging this pull request may close these issues.



2) Branch 2

Fix: dice roll formula allows 1–6 #3

Merged jatin-gurjar-enjoy merged 1 commit into main from 1-bug-dice-roll-calculation-formula-limits-maximum-result-to-5 1 hour ago

Conversation 0 Commits 1 Checks 0 Files changed 1 +1 -1

jatin-gurjar-enjoy commented 1 hour ago
Changes Made

- Updated dice roll formula in main.c
- Verified correct output for all dice faces

Fix: dice roll formula allows 1–6 6c82586

jatin-gurjar-enjoy linked an issue 1 hour ago that may be closed by this pull request
[Bug: Dice Roll Calculation Formula Limits Maximum Result to 5 #1](#) Closed

jatin-gurjar-enjoy merged commit 24a58e7 into main 1 hour ago Revert

Pull request successfully merged and closed Delete branch

You're all set — the 1-bug-dice-roll-calculation-formula-limits-maximum-result-to-5 branch can be safely deleted.

Reviewers: No reviews

Assignees: No one—assign yourself

Labels: None yet

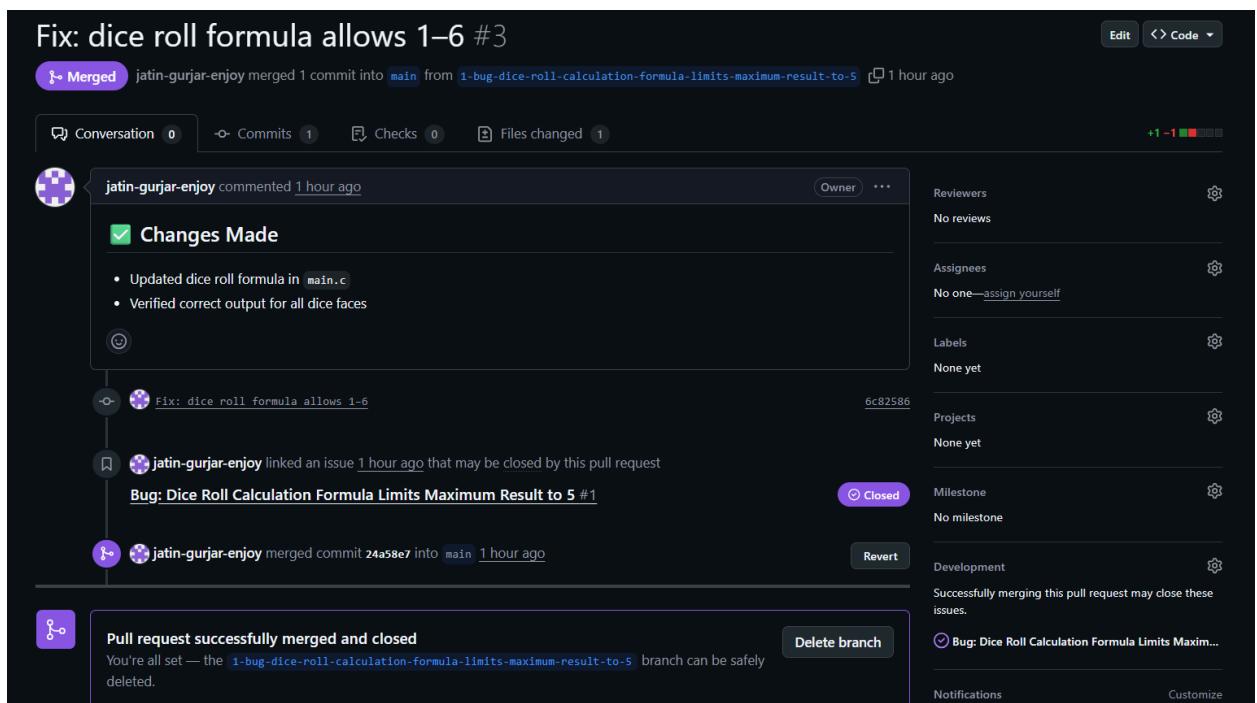
Projects: None yet

Milestone: No milestone

Development: Successfully merging this pull request may close these issues.

Bug: Dice Roll Calculation Formula Limits Maximum Result to 5 #1

Notifications Customize



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-calcu...	...
⌚ 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-calcu... 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.