Google Summer of Code (GSoC) 2025 Proposal

Project Title: Improving GRASS GIS Developer Experience through Pytest Support

Personal Information:

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Synopsis:

This project will update the GRASS GIS Python testing system by adding support for pytest. Right now, GRASS uses a custom testing setup based on Python's unittest, which has some older, complex parts. By switching to pytest, it will be easier to write simpler and more readable tests. The project includes building helpful tools like test fixtures, breaking down comparison functions into reusable parts, and making sure things work well with grass.script.setup and create_location.

Benefits to the Community:

Adding pytest support will make life easier for developers working on GRASS GIS. It will simplify the way tests are written, which is especially helpful for new contributors who want to get involved. This change will also make testing faster and more reliable. Overall, it will help the project move toward more modern development practices and improve the quality of the code by encouraging more tests across different parts of the project.

Deliverables:

- Break down existing test comparison tools from grass.gunittest so they can be reused with pytest
- Create simple setup tools (called fixtures) to start and clean up temporary GRASS GIS sessions
- Make sure grass.script.setup and create_location work smoothly with pytest
- Update some current tests to use the cleaner, easier pytest style
- Write clear documentation and include example tests using pytest
- *(Optional)* Add tools to measure test performance or help integrate with modern test automation tools (CI/CD)

Timeline:

- Community Bonding (April–May):
    - Learn how the current grass.gunittest framework works and get familiar with pytest
    - Talk with mentors and other contributors to understand the project better
    - Try running existing tests and explore how GRASS GIS is set up
- Phase 1 (May–June):
    - Start by breaking out the comparison functions from the current test system
    - Begin writing tests using pytest style
    - Create a basic fixture to handle temporary GRASS GIS sessions during testing
- Midterm Deliverables:
    - A working set of pytest-based tests for some parts of the project
    - Fixtures and helper tools working as expected
- Phase 2 (July):
    - Update parts of GRASS GIS (grass.script.setup and create_location) to work well with pytest
    - Convert more tests to use pytest
    - Start writing clear documentation and show examples of how to use the new test setup
- Final (August):
    - Clean up the code and improve the docs
    - Submit a test coverage report
    - Wrap things up and complete the final evaluation

About Me:

I'm an 18-year-old Computer Science undergraduate who's passionate about open-source projects and using Python to solve real-world problems. I've worked with Python, SQL, Git, and scripting, and lately I've been exploring areas like testing, machine learning, and geospatial tech. I'm new to GRASS GIS, but I'm a quick learner and genuinely excited to contribute. I'm looking forward to growing through this project and making helpful, long-term contributions to the codebase.

Why Me?:

I'm really excited about this project because it combines my love for Python with something I find fascinating — geospatial technology and maps! I've always been curious about how geomaps work, and being able to contribute to a tool like GRASS GIS feels both meaningful and fun. I care a lot about writing clean, helpful code, and making things better for other developers through improved testing really resonates with me. I'm self-driven,

easy to communicate with, and eager to contribute not just during GSoC, but even after it ends.