

Innovating Computer Science Education

with GitHub Integration



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International Conference
The Future of Education



Welcome

- Professor at Tecnológico de Monterrey
- Computer Science Engineer, Digital Transformation Engineer and Data Science Engineer Academics Program Director.
- Software Engineering Professor



Challenge & Goal



**CHALLENGE: THE GAP BETWEEN
ACADEMIC TRAINING AND INDUSTRY
EXPECTATIONS**



**GOAL: BRIDGE THAT GAP USING
GITHUB IN A FOUNDATIONAL CS
COURSE**

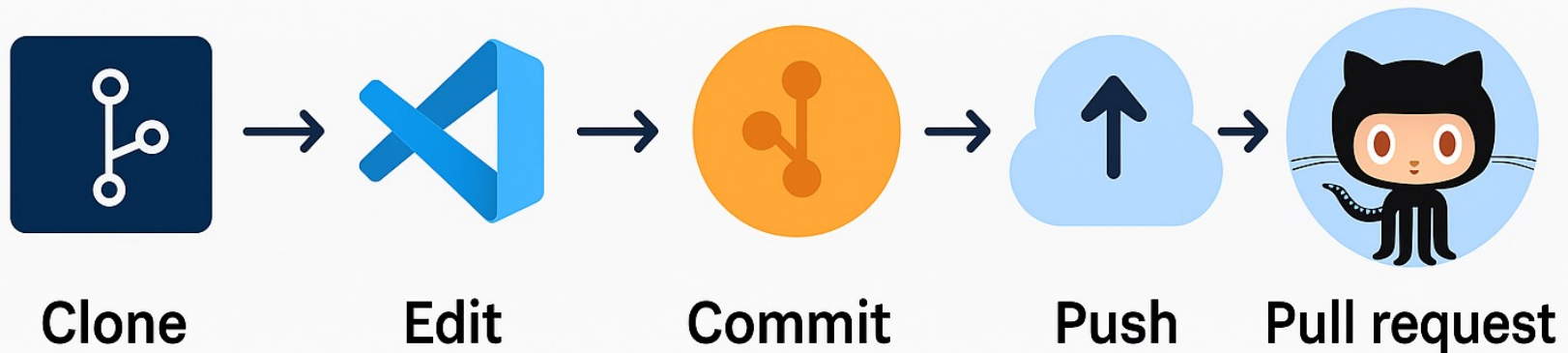
Why GitHub?

- Industry-standard tool
- Supports versioning, collaboration, documentation
- Underused in early university courses



Objectives of the Innovation

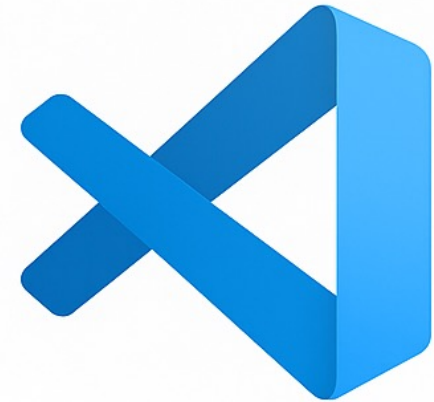
- Teach GitHub workflows
- Use GitHub in all course projects and activities
- Evaluate skill gains and perceptions



Course: Data Structures

Tools: GitHub + Visual Studio Code

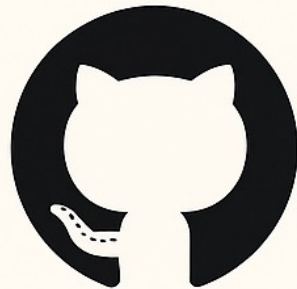
- 15 individual activities
- 4 milestone collaborative projects



Methodology Overview



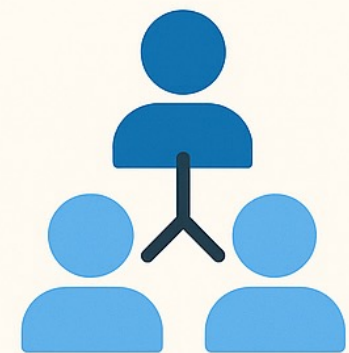
Coding
assignments



GitHub
repositories



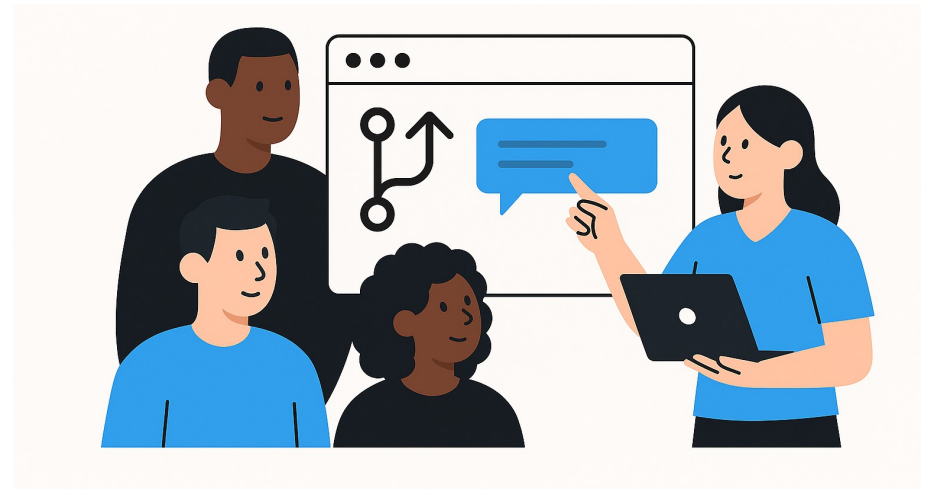
Code
review



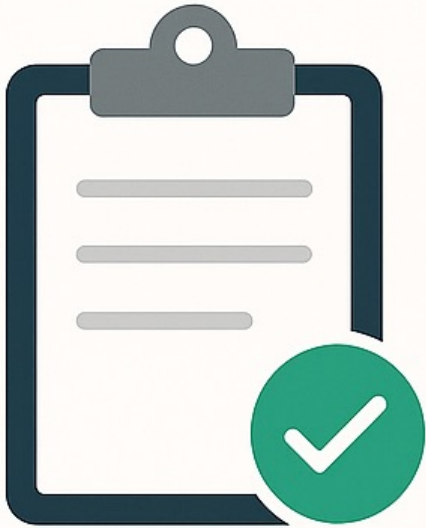
Team-based
projects

Team Collaboration

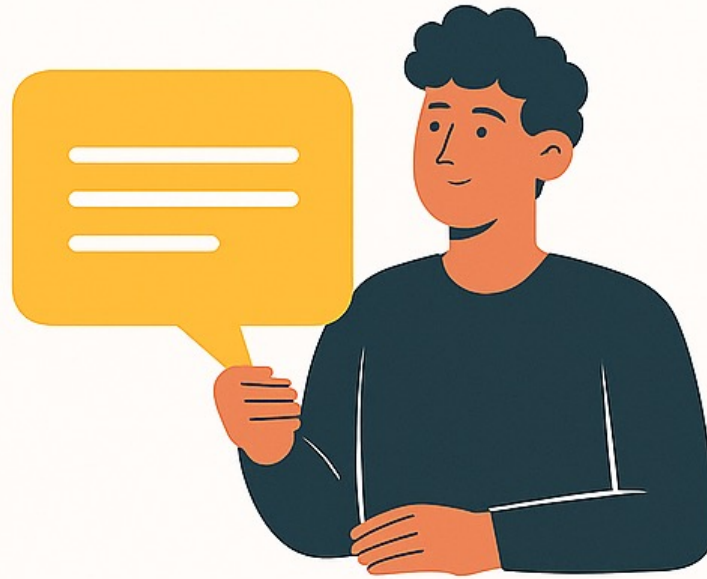
- Branching & conflict resolution
- Pull requests & reviews
- Shared in-class repo



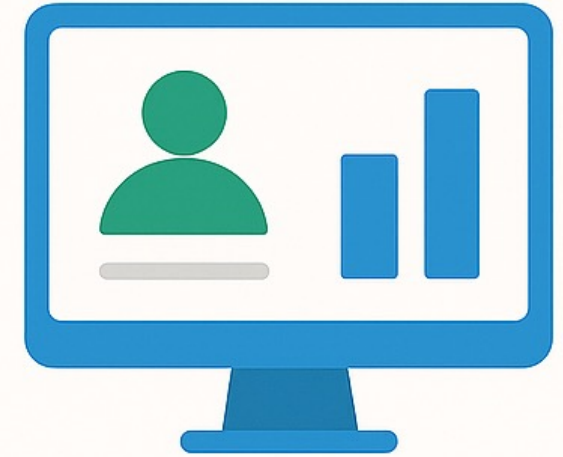
Evaluating and Monitoring



Survey



Feedback



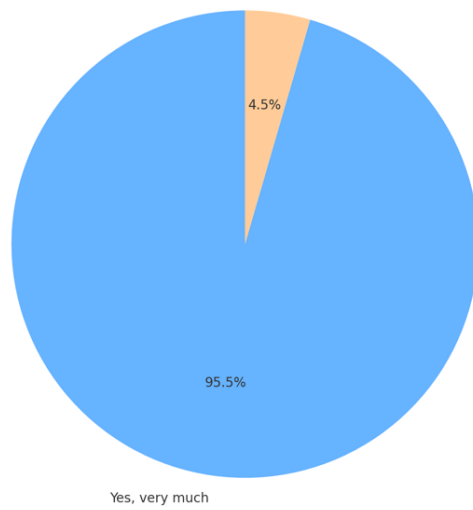
Participation

- Assessing student activities
- Collecting qualitative responses
- Tracking project completion

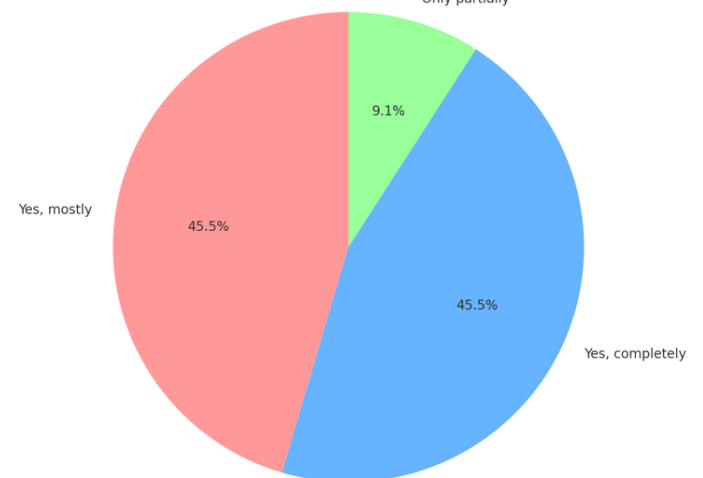
Key Outcomes

- 100% task completion
- 96% see GitHub as useful
- 91% see GitHub as a great collaborative tool
- 95% will continue using it

Do you think the GitHub skills you acquired will be useful for other academic or professional projects?



Were you able to collaborate effectively with your classmates using GitHub?



Student Feedback

- Confidence in version control
- Better collaboration
- Requests for deeper examples



Suggestions for Improvement



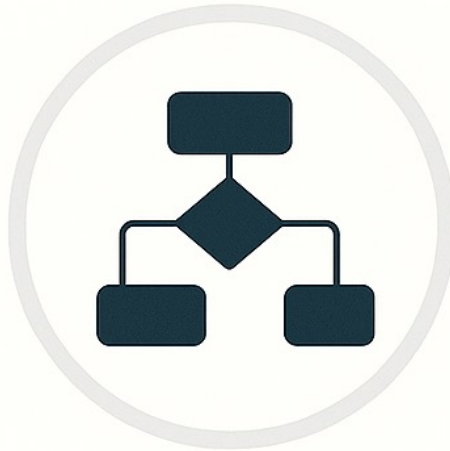
More on advanced workflows

Intro class for beginners

Realistic, large-scale tasks

Extra learning materials

Educational impact



Bridges
academic
content with
real-world
practices



Encourages
early development
of professional
habits



Strengthens
preparation
for internships
and future roles

Final Thoughts

- GitHub transformed the course
- Model for other CS courses
- Reinforces industry-aligned learning



Grazie

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