

GitHub & GitHub Classroom

Integration in Associate Degree Programs



Welcome



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Passionate developer and lecturer



Programming

Associate Degree

2 year program 166 students

3 year program 204 students







Agenda

- An overview of our main actors
- A bit more in depth on the functionality
- Some heavy lifting (on your end)
- Behind the scenes (how did we create the previous?)
- Integrating
- Challenges
- Group therapy
- Q&A (closing remarks/feedback)







Our main actors today

A quick introduction



git

- free, open source
- distributed version control system
- small -> very large projects
- easy to learn





https://git-scm.com/





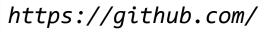
GitHub

- platform / cloud-based service
- version control using git
- adds the options of;
 - access control
 - bug tracking
 - (software) feature requests
 - task management
 - continuous integration
 - wikis
 - •











GitHub Classroom













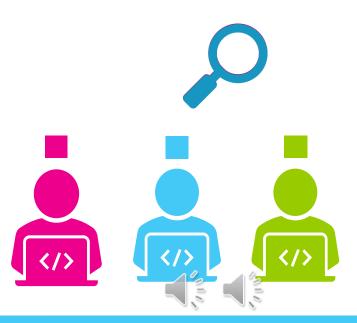


A highlevel overview

Let's check what GitHub and GitHub Classroom could do for us

GitHub





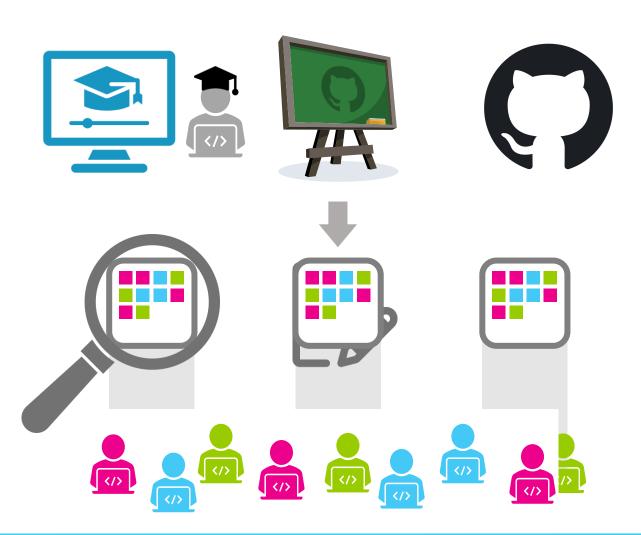
- Developer Team
- Repository
- Committing work
- Review committed work

- ✓ Collaboration on shared codebase
- ✓ History and versioning
- ✓ Peer reviews





GitHub Classroom



- Classroom creation
- Assignment creation
- Team formation (optional)
- Students accept assignment

- √ Repository per team/student
- ✓ Real-world versioning control
- ✓ Educator reviews and feedback





GitHub Classroom Features

- ✓ Create assignments
 - individual or groups
 - supports repository templates
- ✓ Automatic repository creation

- ✓ Grading and feedback
 - feedback on code level
 - autograding with unit tests

- √ Monitor assignments
 - submissions
 - late submissions
- ✓ Integrates with GitHub
 - version control and history
 - discussions and reviews
 - integrated IDE (VS Code)
 - development environment
 - CI/CD tooling
 - ...





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Hands on!

We've got something for you!



Before we dive deeper

Let's get to know each other through ...

A GitHub Classroom Assignment



You'll need a **GitHub** account!















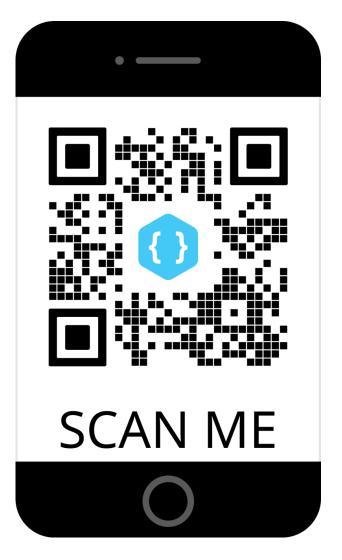


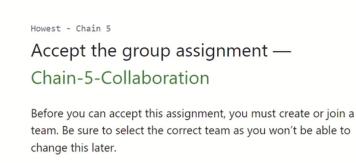












Join an existing team Participants 0 Join OR Create a new team + Create team Create a new team





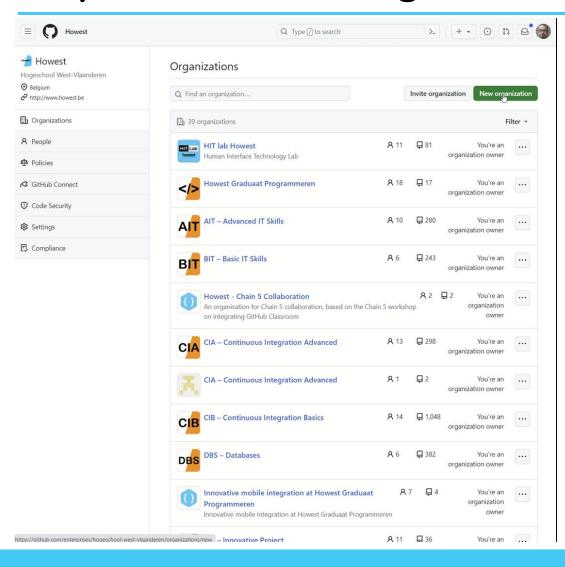
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How much work did this take?

Let's take a look

O

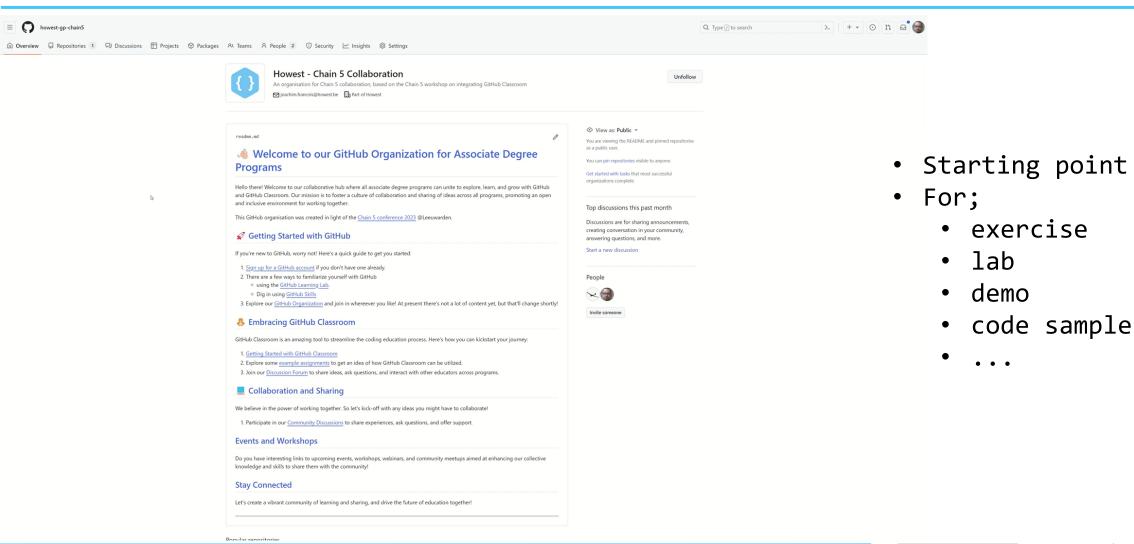
Step 1 - create an organisation



- One time only
- Recommended 🖗
 - 1 Organisation per course
 - One stop shop for all course material
 - Align naming conventions and setup
- Simple and straightforward
- Customisation possible



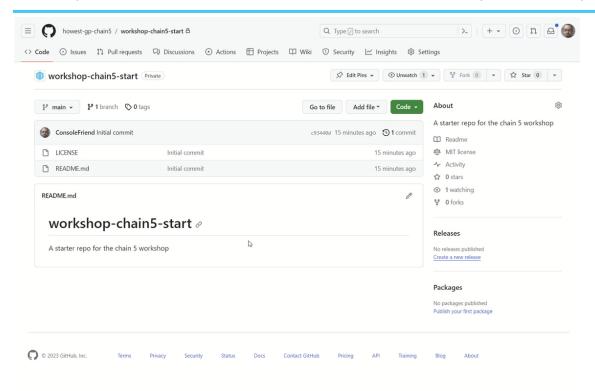
Step 2 - create a repository







Step 3 - add information (code) to the repository

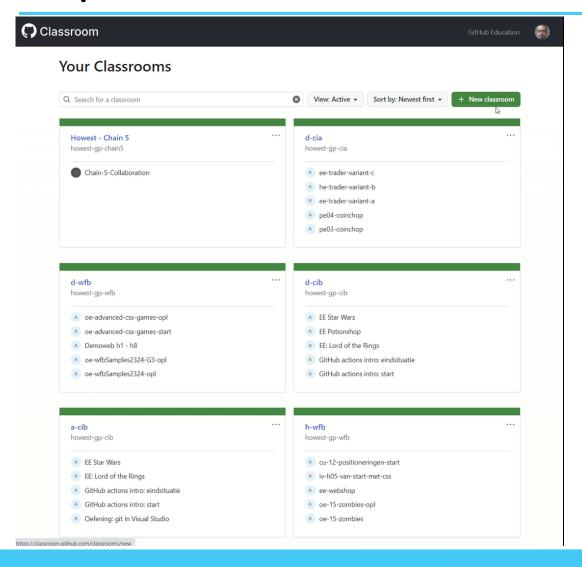


- Add code, information, guidelines, ...
- Recommended 🖗
 - Align naming conventions and setup
 - Make use of markdown

- Simple and straightforward
- Customisation possible



Step 3 - create a classroom

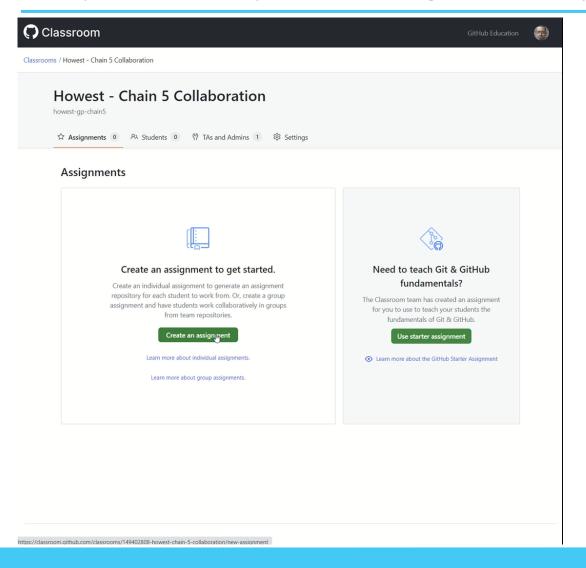


- Link Classroom => Organisation
- Invite colleagues
- Add your students
 - Via Google Classroom
 - Canvas
 - Moodle
 - Sakai
 - Manually
- Recommended **P**
 - Align naming conventions and setup





Step 4 - setup an assignment (basics)

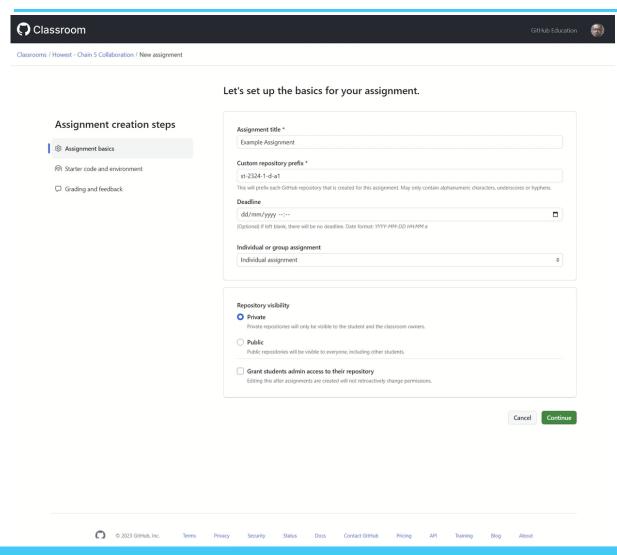


- Title
 - Prefixes student repository
- Add a starting point (can be blanc)
- Individual or group
- Optional use of Codespaces
- Optional use of Autograding (test)
- Optional use of feedback PR
- Recommended **a**
 - Private repositories
 - Align naming conventions and setup





Step 5 - managing an assignment (students)



- Title
 - Prefixes student repository
- Add a starting point (can be blank)
- Individual or group
- Optional use of Codespaces
- Optional use of Autograding
- Optional use of feedback PR
- Recommended 💡
 - Private repositories
 - Align naming conventions and setup





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The (potential) integration

How can **you** integrate?

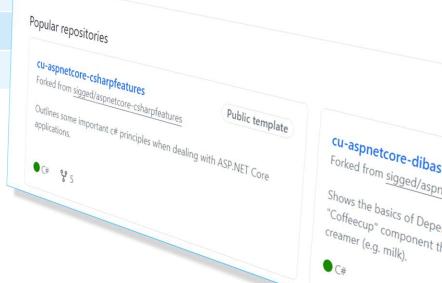
Curriculum integration

Create one GitHub organization per Course Unit

| Course Unit | Abbreviation | GitHub Organization |
|--------------------|--------------|----------------------------------|
| Programming Basics | PRB | https://github.com/howest-gp-prb |
| Web Backend | WBA | https://github.com/howest-gp-wba |
| | | |
| Workplace Learning | WPL | https://github.com/howest-gp-wpl |

- Public visibility
- Add educators as admins
- No permissions for students by default
 - → permissions are per repository, granted by GitHub Classrooms









Curriculum integration

Categorizing course materials on GitHub and GitHub Classroom



Content

- Instructionals
- Example code
- Sample projects
- ..



Exercises

- Free practice
- Challenges
- Project-based
- Solutions
- ...



Tests

- Graded tests
- Exams
- Group-based projects
- Individual projects
- •

Continuous evaluation

→ Iterative practice

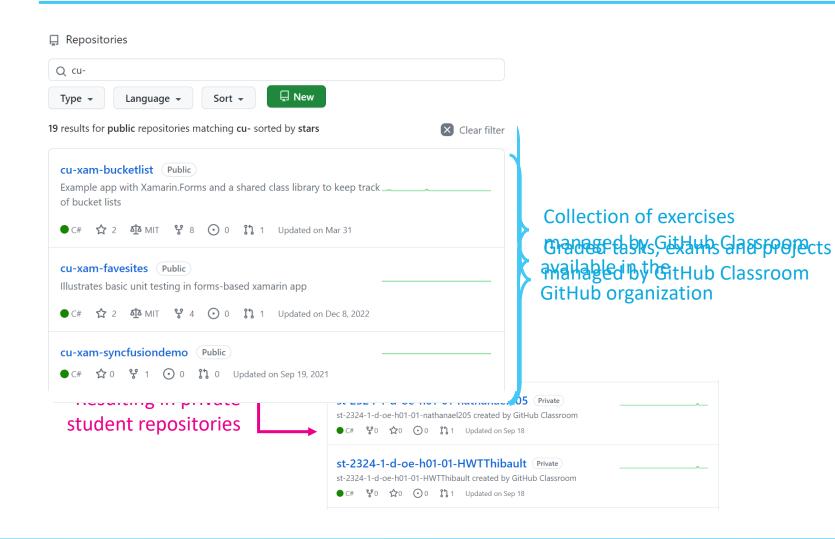
→ Skill assessment

→ Complements lectures





Curriculum integration





Tests

- Graded tests
- Exams
- Group-based projects
- Individual projects
- ...





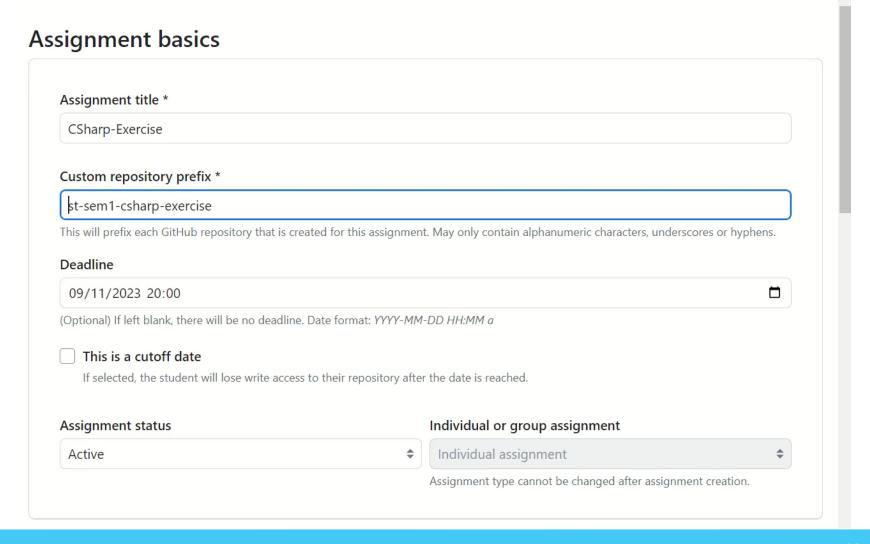
Tips for engaging exercises

- Clear instructions
 bundled with starter code or as a list of tasks
- Progressive complexity start easy, end with a challenge
- Provide starter code immediate focus on the learning objective
- Use GitHub Actions
 for automatic feedback on code quality
- Encourage exploration



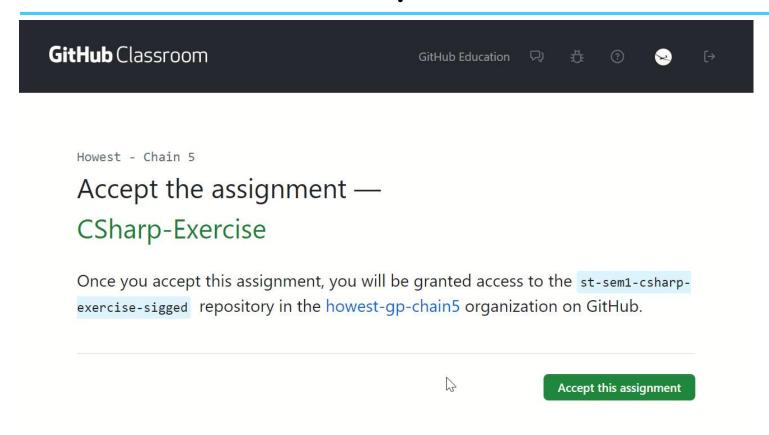


Demo: setup autograding and reviews





Demo: student acceptance



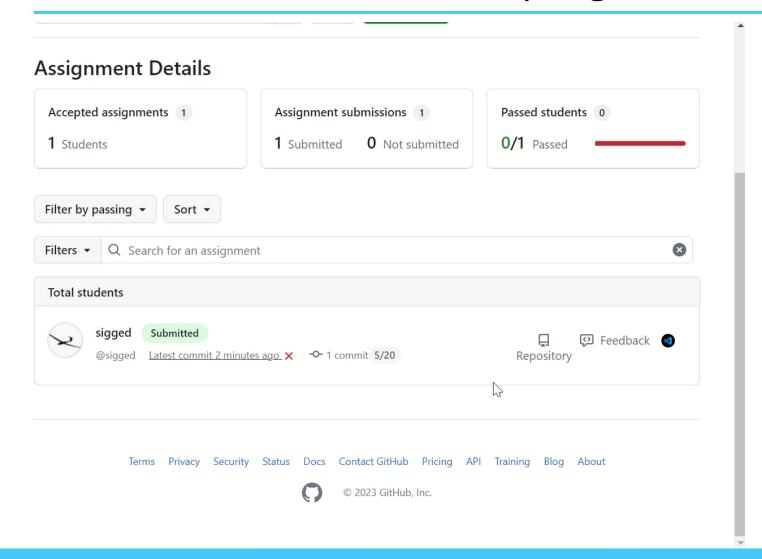


Demo: student solves exercise

```
st-sem1-csharp-exercise-sigged [GitHub]
      =
                                         C# BmiCalculator.cs X C# PaySlip.cs
                                          src > C# BmiCalculator.cs > {} Howest.Prb.BmiCalc > C# BmiCalculator > C# CalculateBmi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Part of the last o
                                                                                   namespace Howest.Prb.BmiCalc
                                                                                                          public class BmiCalculator
                                                                                                                                  // Task 1
                                                                                                                                  public double CalculateBmi(double height, double weight)
                                                                                                                                                          throw new NotImplementedException();
                                                          9
                                                   10
                                                   11
                                                   12
     . . .
     (8)
   202
```



Demo: educator monitors progression



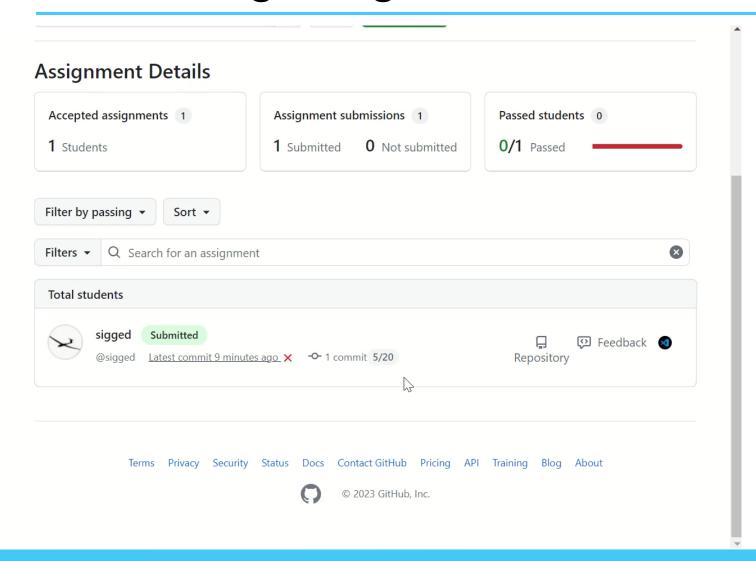


Demo: student finalizes exercise

```
st-sem1-csharp-exercise-sigged [GitHub]
      C# PaySlip.cs X
                                                                                        ...
      src > C PaySlip.cs > {} Howest.Prb.BmiCalc > ♀ PaySlip > ♀ CalculateGrossPay
         9
                          TaxRate = taxRate;
       10
       11
                      public double HoursWorked { get; set; }
       12
                      public double HourlyRate { get; set; }
        13
                      public double TaxRate { get; set; }
       14
       15
                      // Task 2
       16
       17
                      public virtual double CalculateGrossPay()
        18
        19
                          throw new NotImplementedException();
        20
        21
. . .
        22
                      // Task 3
                      public virtual double CalculateNetPay()
        23
        24
                          throw new NotImplementedException();
        25
        26
        27
        28
       $ master ⊕ ⊗ 0 △ 0 $5 Pull Request #1
                                                Spaces: 4 UTF-8 with BOM LF ( € C# Layout: US  □
```

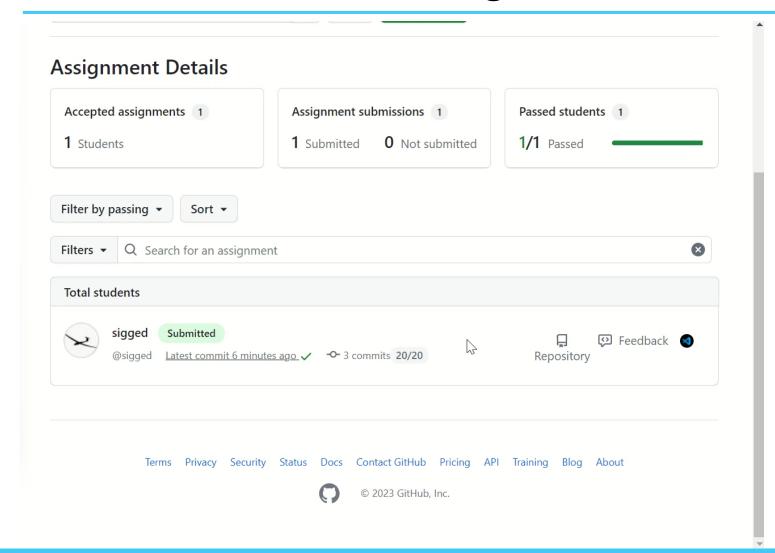


Demo: autograding in action





Demo: reviews with fine-grained feedback





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Challenges?

What did we encounter?
How did we overcome?
What resources are there?

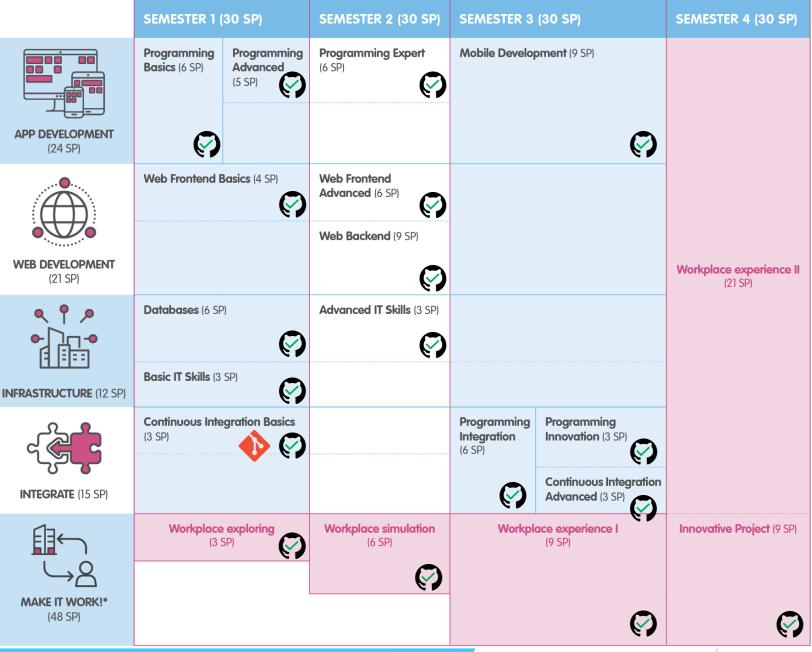
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Challenge !

 Students need basic knowledge of git

Our solution \mathbb{Q}

- Add a course on the basics
 - git Porcelain commands suffice
 - Basics on GitHub





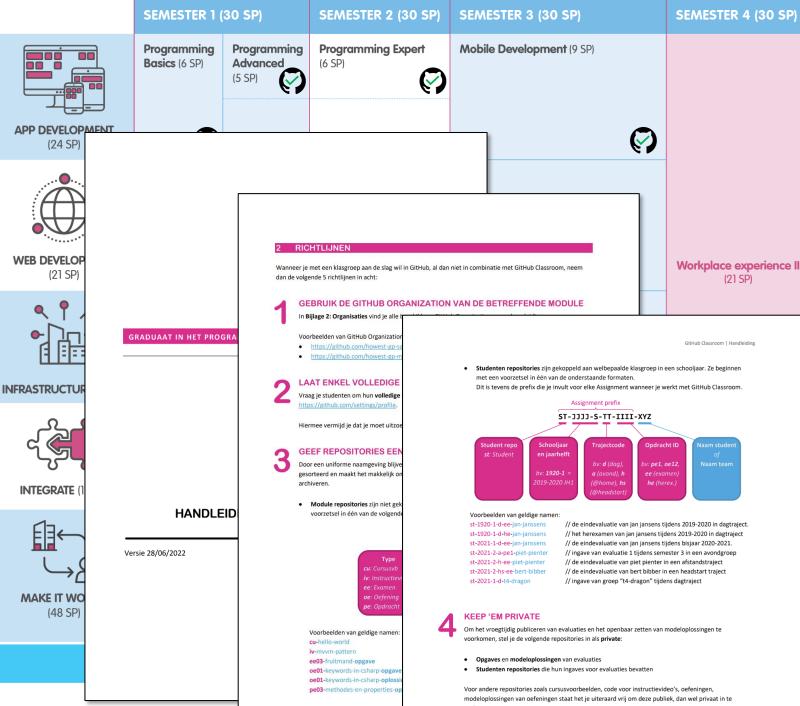


Challenge

• 18 courses - 18 colleagues Things tend to get wild

Our solution **Q**

• Setup team conventions in the use of GitHub (Classroom)

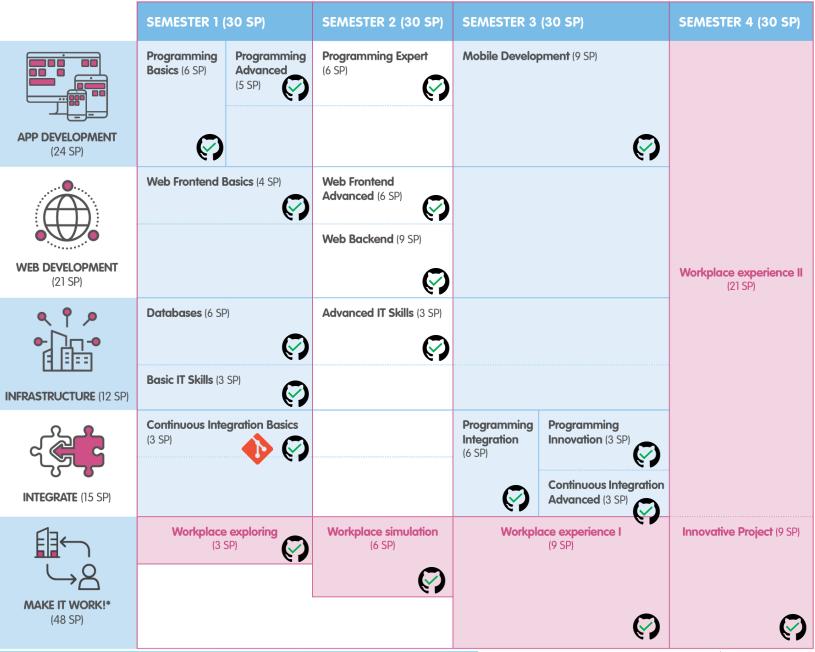


Challenge !

 Recreate an organisation / Classroom every semester

Our solution \mathbb{P}

- Archive student repos (easy due to conventions)
- Reuse organisation + Classroom





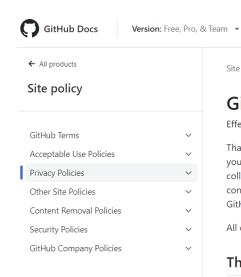






Resources

| Report | Coverage period | |
|---|--------------------------|-------------------|
| SOC 1, Type 2 Report | | |
| The SOC 1, Type 2 report documents GitHub's internal controls that may be relevant to a customer's financial statements. The GitHub SOC reporting period concludes September 30. New SOC 1 & SOC 2 reports will be available by the end of November. | 2021-10-01 to 2022-09-30 | 丛 Download |
| SOC 1, Type 2 Bridge Letter | | |
| Accompanying bridge letter for the SOC 1, Type 2 report. The bridge letter will cover the period from October 1 - December 31. The letter will be available by the end of January the following year. | 2022-10-01 to 2022-12-31 | 业 Download |
| SOC 2, Type 2 Report | | |
| The SOC 2, Type 2 report evaluates GitHub's controls relevant to operations, security, and compliance upon which a customer may rely. The GitHub SOC reporting period concludes September 30. New SOC 1 & SOC 2 reports will be available by the end of November. | 2021-10-01 to 2022-09-30 | 丛 Download |
| SOC 2, Type 2 Bridge Letter | | |
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| GitHub.com ISO/IEC 27001:2013 certification | | |
| This certificate is evidence of the GitHub Information Security Management System conformance with the ISO/IEC 27001:2013 standard as a result of an audit performed by an ANAB-accredited certification body. | 2022-05-06 to 2025-05-05 | 业 Download |
| GitHub.com ISO/IEC 27701:2019 certification | | |
| This certificate is evidence of the GitHub Privacy Information Management System conformance with the ISO/IEC 27701:2019 standard as a result of an audit performed by an ANAB-accredited certification body. | 2023-05-25 to 2025-05-05 | 丛 Download |
| GitHub.com ISO/IEC 27018:2019 certification | | |
| This certificate is evidence of the GitHub Information Security Management System conformance with the ISO/IEC 27018:2019 standard as a result of an audit performed by an ANAB-accredited certification body. | 2023-05-25 to 2025-05-05 | 丛 Download |
| GitHub.com CSA STAR Level 2 certification | | |
| This certificate is evidence of the GitHub's conformance with the Cloud Controls Matrix (CCM) in coordination with an assessment of the ISO/IEC 27001:2013 standard performed by an ANAB-accredited certification body. | 2023-06-27 to 2025-05-05 | 丛 Download |
| GitHub.com Services Continuity and Incident Management Plan | | |
| The Services Continuity and Incident Management Plan documents the measures GitHub has taken to respond to significant business disruptions. | Last updated 2023-04-14 | 业 Download |
| CSA CAIQ | | |
| The Cloud Security Alliance Consensus Assessment Initiative Questionnaire (CSA-CAIQ or CAIQ) is a self-assessment that evaluates a cloud provider against CSA's Cloud Control Matrix. | | ☐ View |



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To see our Privacy Notice for U.S. Residents, please go to GitHub's Notice about U.S. State Data Privacy or scroll down.







Resources

- https://docs.github.com/
- https://docs.github.com/en/get-started/getting-started-with-git
- https://education.github.com/pack#offers For students
- https://github.com/howest-gp-chain5
- https://github.com/howest-gp/conventions

Fun Fact **We run approx.** 30k + repositories each semester!



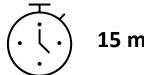
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Group therapy!



Group therapy!

- Small 'break-out' teams
- ? After our short session, do you see possibilities to integrate GitHub / GitHub Classroom in your program.
- ? Do you think it's interesting to collaborate further on this topic within the chain5 setting.
- ? Do you still have questions or concerns you'd like to raise.



15 minutes









feedback





Keep in touch!

links & contact

git https://git-scm.com/

https://github.com/

https://classroom.github.com/

https://classroom.github.com/a/L_B7CDPX

https://github.com/howest-gp-chain5

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