MarkUs, a web based application to annotate student's code

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Summary

Identified needs

Motivation

How to manage and evaluate the work performed by students in projects or in practical work?

Use

- Deployed at the École Centrale de Nantes since september 2010
- Centrale Nantes is contributing to the development of MarkUs since summer 2009
- MarkUs is used in
  - Teaching computer science (reports and source code)
  - Class of more than 350 students
  - More than 20 teachers impacted

Summary

Limitations of classic way to handle practical work

Teachers side

- Important **number** of submissions to handle (hundreds by practical work)
- Difficulty of harmonizing correction factors between graders
- Paper handling
  - Accumulation of papers containing source code
  - Giving back papers to students
- Email handling
  - Mistakes in the grader's name
  - Zip archives not readable
  - Not a smooth process

Limitations of classic way to handle practical work

Students side

- Difficulty to have **feedback** on his work
- Paper handling
  - Loss of reports
  - How to **share** correction with his co-worker?
- Email handling
  - Mistakes in student's names
  - An email among others

MarkUs, an online marking tool

MarkUs? Mark us!

MarkUs is:

- a **web** application
- Aimed at **grading assignments** in computer science
- **Versioned** repository of student's work
- **Direct annotation** of documents by teachers
- Reduced **time** of correction

Organization around MarkUs

MarkUs team

Karen Reid, senior lecturer at the University of Toronto, team leader
Morgan Magnin, associate professor at the École Centrale de Nantes, managing french student projects

- 4 core developers
- Quarterly team of students (Canadian and French)
- Several Universities are using MarkUs (Canadian and French)
- Collaborative development on Github

Some features

Improving teaching (grader)

Possibility to **annotate**

- Source code (with syntax highlighting)
- Images
- PDF

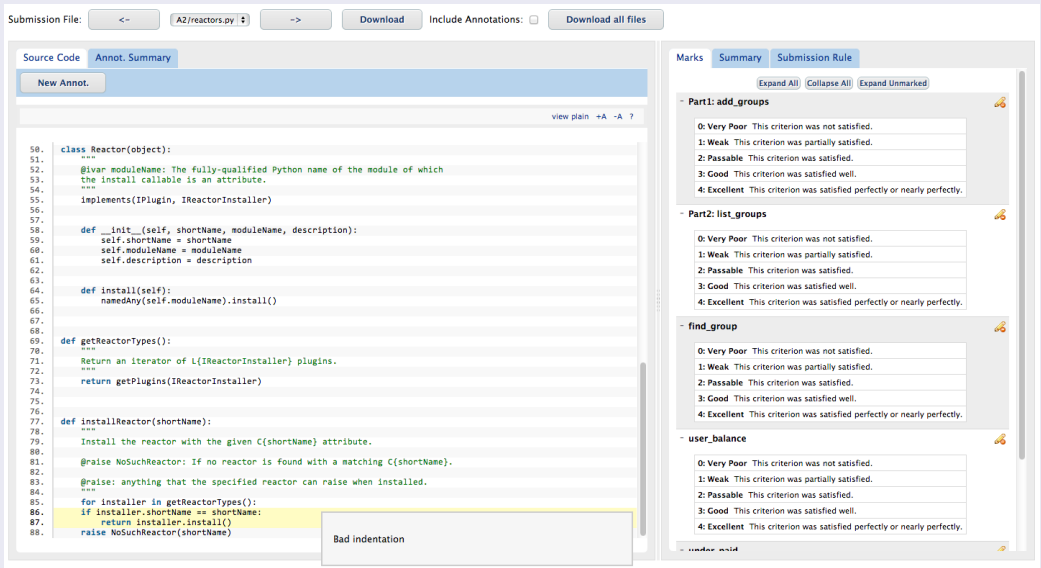

Figure : Grader view

Some features

Improving teaching (grader)

- **Fixed** assessment criteria
- Annotations (source code, images and PDF)
- More than one grader on a paper
- Grader management by criteria

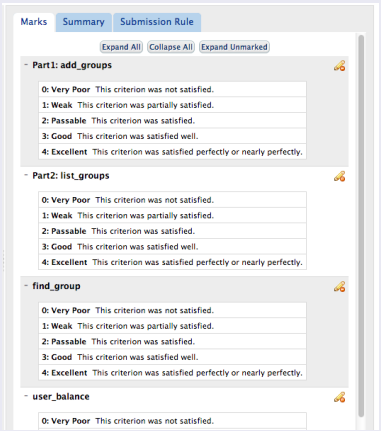

Figure : Set of criteria

Some features

Improving teaching (grader)

- Handling many practical work, with one instance of MarkUs per course
- Managing **deadlines** with configurable penalties
- Possibility to see and grade a **former** version

Some features

Improving teaching (student)

- Creating groups **for each practical work**
- **Exporting** annotations
- Better and faster feedback
- Possibility to read annotations until the evaluation
- Can create **remark request**

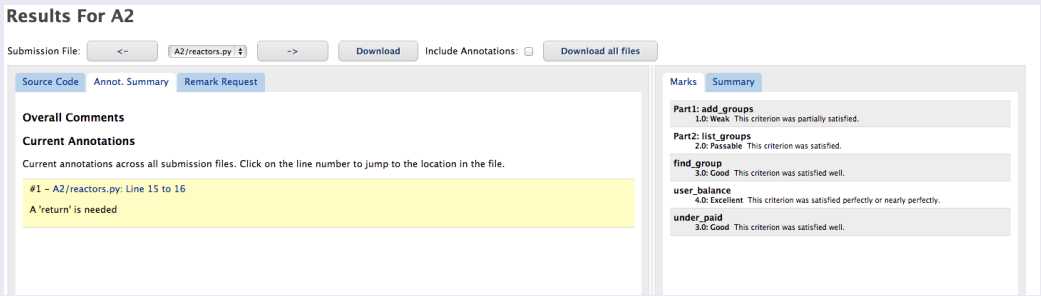

Figure : Result view for students

Some features

Release of MarkUs 1.0

- Compatibility Ruby 1.9.3 and Ruby on Rails 3.x
- **Sections** inside of a class
- Conversion of PDF **instantaneous**
- Added **remark requests**
- **New dashboard** for admin

Demo

And what about seeing MarkUs in action?

Summary

Why MarkUs seduces teachers?

- Managing **large volumes**
- **Centralized** document management
- **Reduced time** for grading (around 50%)
- **Paperless**
- **Mobile** access

Why MarkUs seduces students?

- **Unique** platform to submit and get feedback for practical work
- **Permanent** access to former work graded by teachers
- Improved **time** for obtaining the correction

At Centrale Nantes

Deployment of MarkUs for computer science courses

- Since September 2010
- Connected to **LDAP**
- Used in first and second year:
  - 370 and 340 students
  - 21 teachers
- **Computer science** class:
  - Algorithm
  - C
  - Java

Advantages of MarkUs

Student side:

- Pedagogical effect of **reaching deadlines**
- **Individual access** to the graded work of his group
- **More consultation** of the annotations left by teachers

Advantages of MarkUs

Teacher side:

- Improved **logistics** management
- An initial **standardization** of criteria
- **Incentive** effect for the correction

Summary

Around MarkUs

Practical modalities

- Written in Ruby, with Ruby on Rails
- Documents saved with subversion
- Access through a web interface
- Expert users: access using CLI and REST API

Try it!

- Virtual machine: already configured MarkUs instance

Summary

Synthèse

MarkUs, an online marking tool to annotate student's code

How to improve evaluation process in practical work or student's projects?

MarkUs

- Free software
- Annotation of **source code**, **images** and **PDF**
- Easy to use
- Only cost: installation and maintenance
- Usage popular with students and teachers

Next features

Extend the use of MarkUs

- **Tactile annotation** module
- Integration of **mathematical annotations**
- **Automated testing** of student's code
- Extend MarkUs to other courses
- Integration to a **VLE**[a] ?
- Easy deployment using virtual machines

[a] Virtual Learning Environment

More information

Links and contacts

- Project website: `http://markusproject.org`
- Try it online: `http://demo.markusproject.org`
- GitHub repository: `https://github.com/MarkUsProject/Markus`
- Blog EAT-TICE of the École Centrale de Nantes: `http://eat-tice.ec-nantes.fr`[FR]
- IRC channel: #markus sur irc.freenode.net
- Mailing list: `markus-dev@markusproject.org`