University of L'Aquila

DEPARTMENT OF ENGINEERING COMPUTER SCIENCE AND MATHEMATICS

Master degree in Software Engineering for Adaptive Systems

AUTOMATED APPROACHES TO ASSESS THE SIMILARITY OF OPEN SOURCE PROJECTS

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Introduction

Scenario

Introduction

Challenges

- Searching for canditate components.
- Evaluating a set of retrieved canditate components to find the most suitable one.
- Adapting the selected components to fit the spicific requirements.

Introduction

Similarity Overview

- **Low-level Software Similarity**: Using source code (variable/function names, API references, etc.)
- **High-level Software Similarity**: Using metadata such as readme files, description, GitHub star events

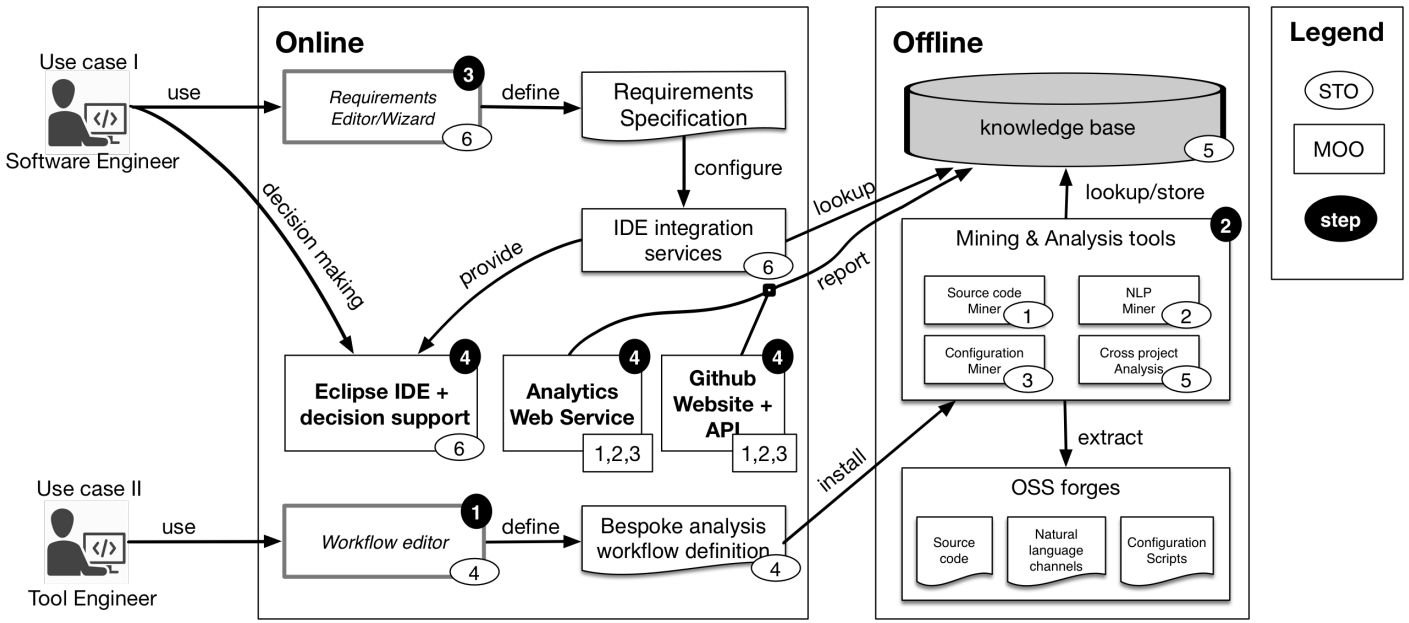
CROSSMINER

Description

- CROSSMINER aims at addressing such challenges by providing advanced techniques and tools supporting the identification and adoption of existing high-quality open source software components instead of implementing in-house propietary solutions with similar functionalities.

CROSSMINER

System Architecture



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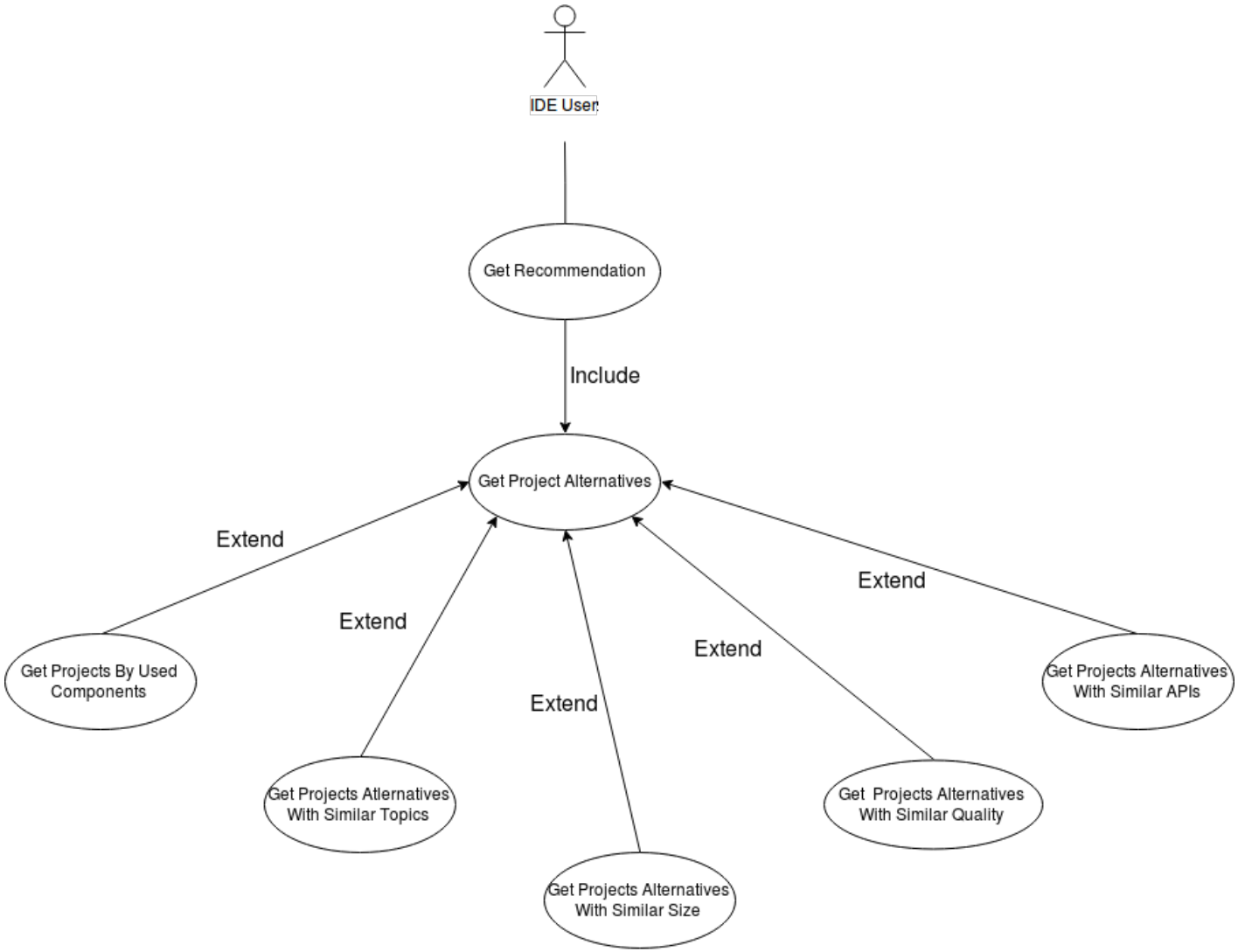
System Architecture



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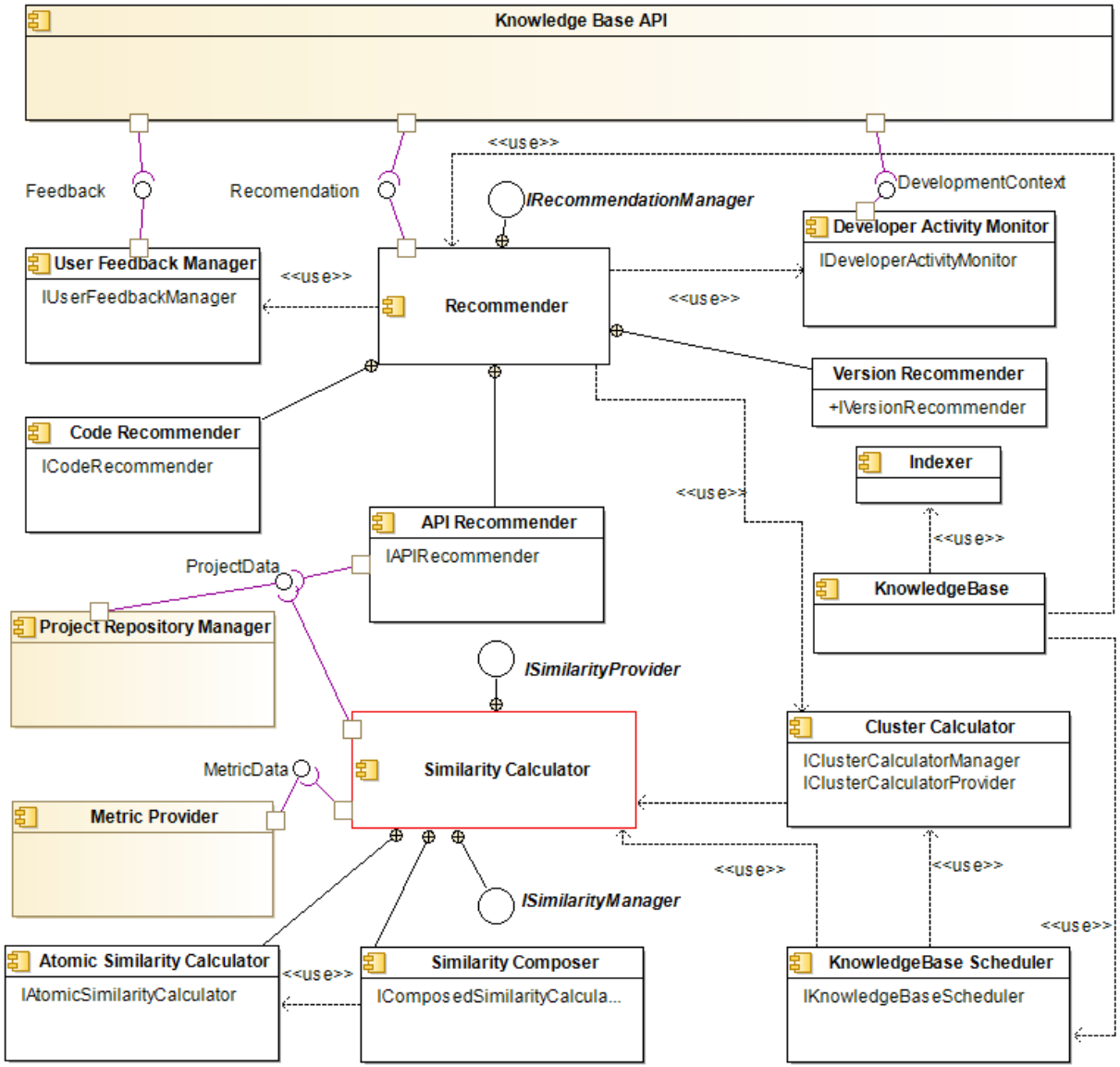
System Architecture



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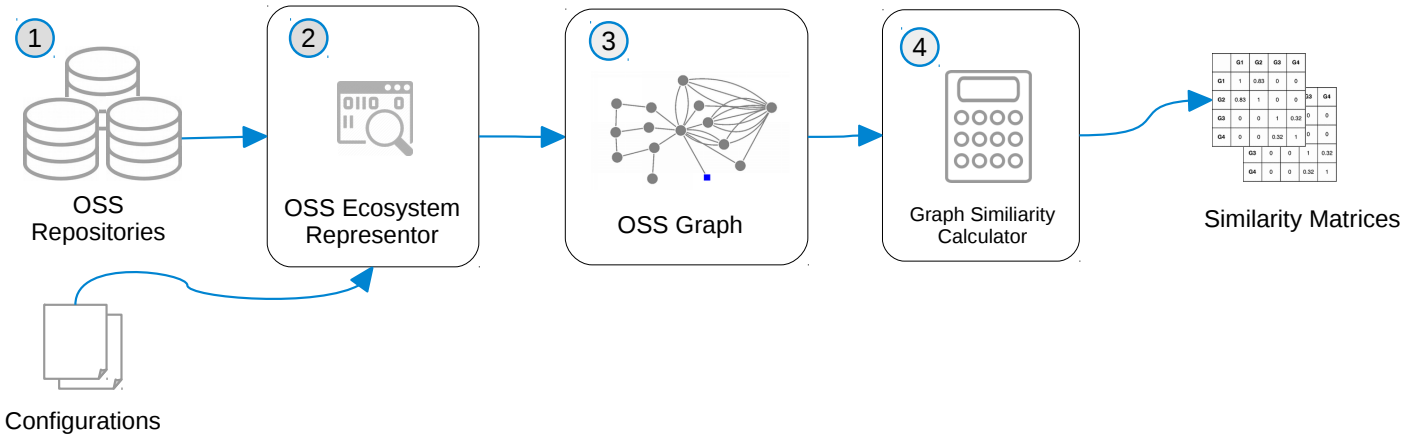
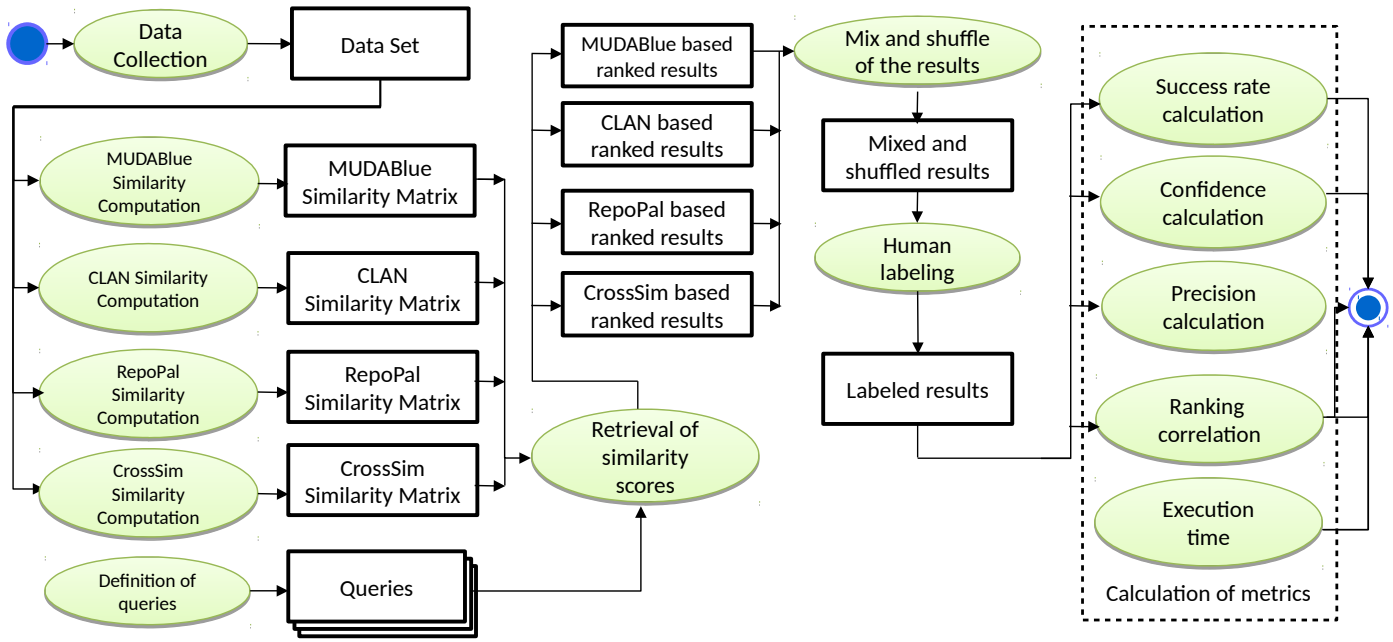
CROSSSIM



Contribution

Evaluation Process



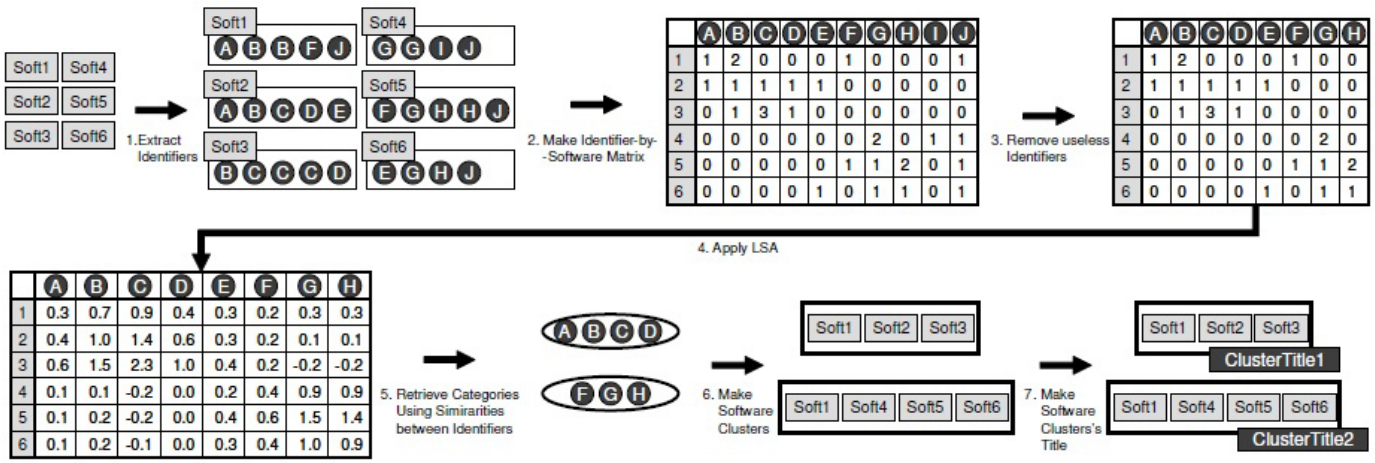
Contribution

Procedure

- Studying the originals papers
- Implentation
- Testing

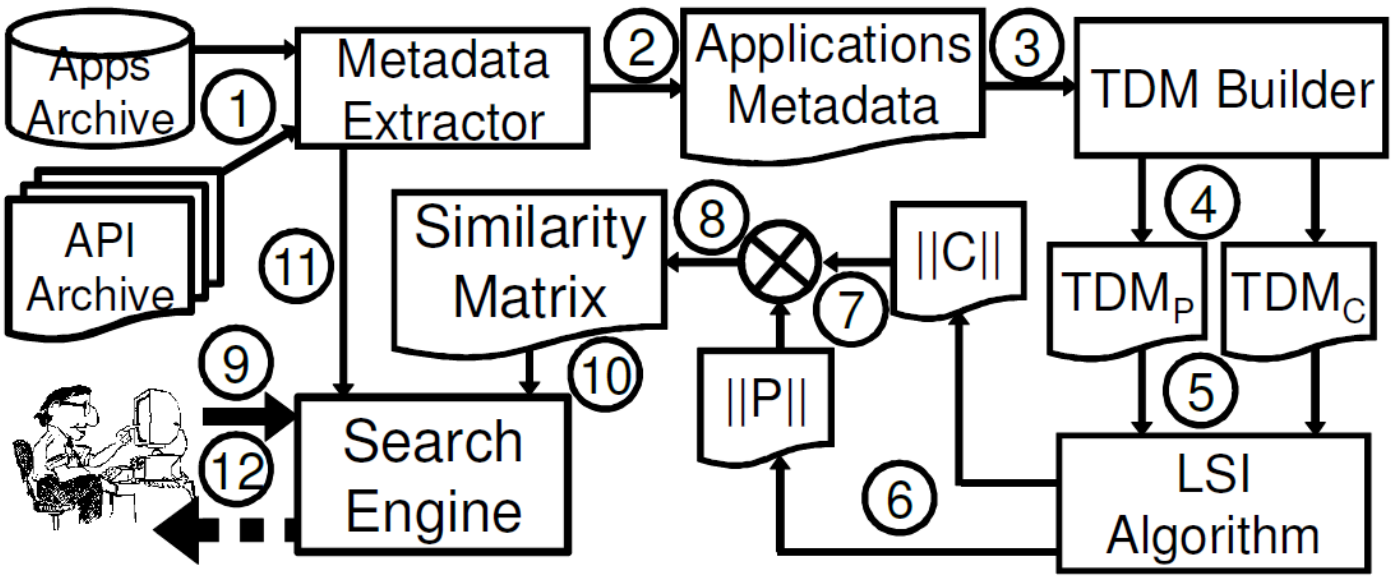
Contribution

MudaBlue



Contribution

CLAN



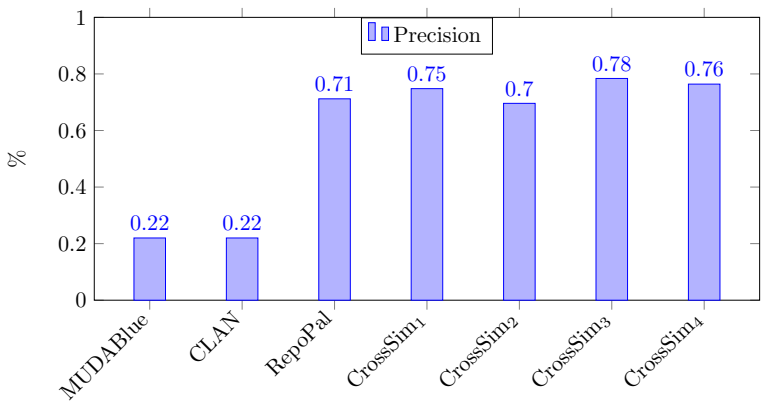
Evaluation

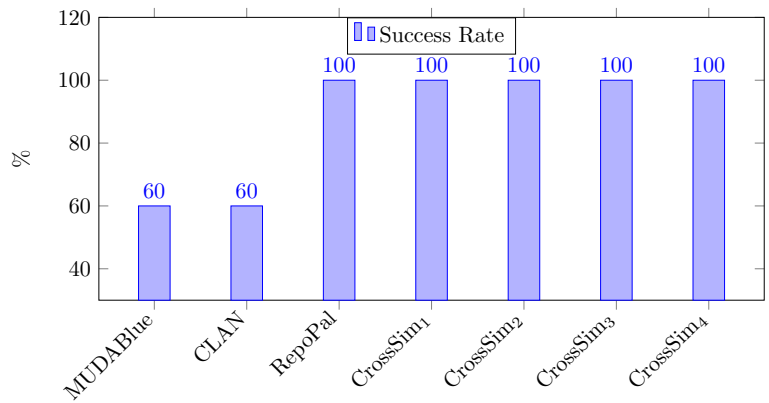
User Study

- User study: Human evaluators label the similarity between query and retrieved projects
- User study: 10 people involved with experience plus a double check
- Similarity scales: *Dissimilar*, *Neutral*, *Similar*, and *Highly Similar*
- Evaluation metrics: Success Rate, Confidence, Precision

Evaluation

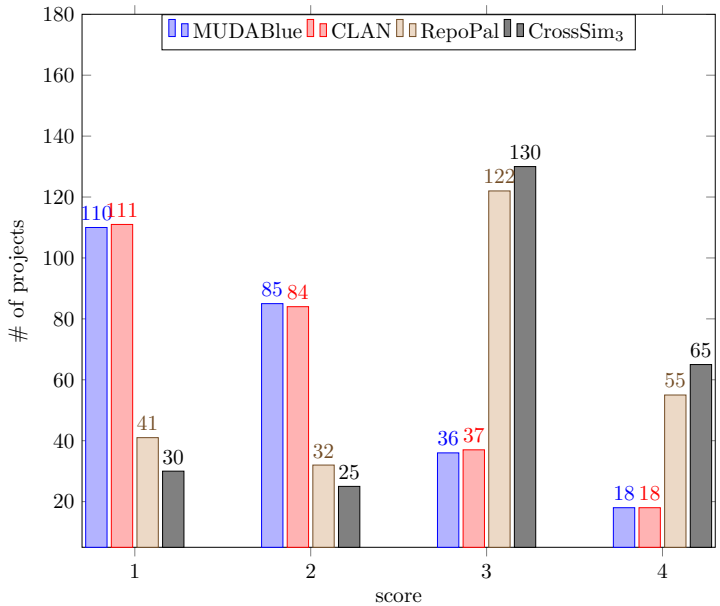
Results

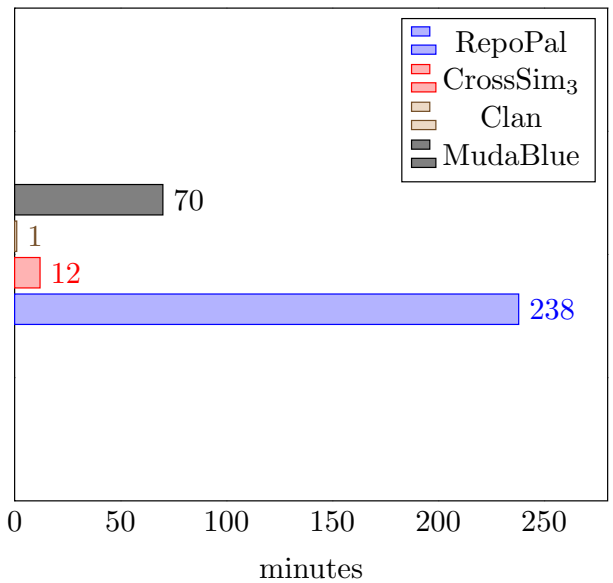




Evaluation

Results





Conclusion

What Has Been Done

- Implementation of two approaches
- Evaluating the results
- Confirmation of the goodness of CrossSim

Conclusion

What Else to be Done

- Eclipse Integration
- Provide API recommandation
- Provide snippets of code