Engaging in Logical Code Reasoning with an Activity-Based Online Tool

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Typical Code Reasoning

- Involves running code on specific input values and studying outputs
- Provides limited understanding
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Search Terms: Clemson RESOLVE

https://www.cs.clemson.edu/resolve/
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Search Terms: Clemson RESOLVE
Motivational Video:
https://www.youtube.com/watch?v=ehIgP4hD_Ek&feature=youtu.be

Begin to Reason Tool:
https://resolve.cs.clemson.edu/beginToReason/section1dry

Reason with Components Tool:
https://resolve.cs.clemson.edu/teaching
Online Logical Reasoning

- Search Terms: Clemson RESOLVE
- Motivational Video
- Introduction to Symbolic Reasoning with BeginToReason Tool
- Reasoning with Activities
  - Introductory Activities
  - Advanced Activities—Design By Contract
  - Advanced Activities—Loop Invariants
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Motivational Video:
https://www.youtube.com/watch?v=ehIgP4hD_Ek&feature=youtu.be
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BeginToReason Tool:
https://resolve.cs.clemson.edu/beginToReason/section1dry
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Finding the Tool

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Reasoning with Components:
https://resolve.cs.clemson.edu/teaching
Selecting the Tool

- Select tab Web IDE
  - Select BeginToReason OR
  - Select Reasoning with Components
Finding the Activities

- Select Reasoning with Components
  - Select Components Button
  - Select Programs in the Finder
  - Select Activity 101
Reasoning Basics

- A step by step description of reasoning activity 101
Reasoning Details

- Additional Details of Reasoning about Activity 101
Design-By-Contract

- An overview of reasoning activity 102
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Loop Invariant Activity

- An overview of a reasoning activity involving queue objects and loops
Publications

- ACM SIGCSE 2019 (Sat AM): Fowler, et al., Impact of Steps, Instruction, and Motivation on Learning Symbolic Reasoning Using an Online Tool

- ACM ITiCSE 2019: Cook, et al., Where Exactly Are the Difficulties in Reasoning Logically about Code? Experimentation with an Online System

- ACM ECSEE 2018: Kraemer, et al., An Activity-Based Undergraduate Software Engineering Course to Engage Students and Encourage Learning
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