CloudCoder — A Web-Based Programming Exercise System

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Programming is hard

- Many students struggle in intro programming courses
- Pass rates of 60% (or worse!) are not unusual[1]
- Students have difficulty learning syntax and basic concepts
- Exercises can help[2]

Exercises can help

- Introduce syntax and concepts in small bites
- Self-test exercises to accompany reading assignments
- In-class assessment
- Optional practice for students who need it

Web-based systems

- Students can access from anywhere using a web browser, no software installation (except on server)
- Lots of existing systems:
  - Free: CodingBat, PracticeIt!, CodeWrite, CodeAssessor, others
  - Commercial: CodeLab, MyProgrammingLab, others
- Why create another?
- Observation: a common model for pedagogical tools is
  1. Implement it
  2. Publish paper(s) about it
  3. Maybe release software and get a few other institutions to use it
  4. Then it fades into disuse
- Observation: adopting courseware has a significant cost
  - Need to convince instructors that a tool will be worth the effort

CloudCoder

- Website: http://cloudcoder.org
- Open source (AGPL v3)
- Supports C, Java, and Python exercises
- (Relatively) easy to host
  - It’s a Java web application
  - Single-jar deployment using Jetty
- Requires two Linux servers:
  - One for webapp, needs a MySQL database
  - One (or more) to build/test student submissions
- Exercise repository: https://cloudcoder.org/repo
  - Simple import/export of exercises
  - Browsing/searching to find exercises

We need your help!

- Try it out!
- Use our exercises!
- Share your exercises!

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Results?

Can CloudCoder improve learning?

Experiences

- Used at 4 institutions (York College, Knox College, Canisius College, University of Auckland)
- Exercise repository: small but growing
- From a student: “Every time I see that green bar makes me WAAAAYYY too happy”

References


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