Project Checkpoint 2
Graph-based Adaptive Diagnosis
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CS 194
Proposed Action

- Increase number of nodes/size of library
- Refine test algorithm
- Compare test efficiency
- Get approval for research study
Accomplishments

Simple Arithmetic
- Addition of single digits
- Addition of multiple digits
- Simple multiplication
- Advanced multiplication
- Subtraction of single digits
- Subtraction of multiple digits
- Simple division
- Long division

Advanced Arithmetic
- Fraction manipulation
- Order of operations
- Decimals
- Reducing fractions
- Using negative numbers
- Evaluating expressions

Algebra
- Number exponents
- Exponent variables
- Inequalities
- Quadratic formula
- Solving one variable equations
- Solving systems of linear equations
- Solving two variable equations
- Polynomial manipulation
- Factorization
- Log and ln
Accomplishments

- Tripled the number of nodes (from 8 to 26)
- Divided the nodes into various regions based on progression of learning/difficulty
- Changed the test algorithm
  - 2 parts:
    - 1) Identifying the border region (where everything below is understood and everything above is not mastered)
    - 2) Exploring the nodes in this region
- Turned in addendum to the UCLA OPRS (hopefully will be approved soon)
Difficulties/Surprises

- Turn human reasoning into code
  - Planned psuedocode has different actions based on specific cases (evaluate like a human tester), difficult turning this reasoning into general code

- When results are ambiguous (not sure if student has mastered a certain region)
  - do we want to evaluate the harder region (and scare them/make them feel bad?) or evaluate the easier region (perhaps not as accurate)

- How many questions is enough to truly get a sense of the student’s capability
  - Maybe asking 3 all the time is too many? (currently asking 2 sometimes depending on the circumstances)

- How many points to deduct
  - Deduct points depending on whether it is the nth question asked (more deducted from questions answered incorrectly later)
Steps/Deliverables

• Spring break:
  • Expand the library from 3 regions to 6 regions
  • Test code thoroughly for bugs
  • Adjust code so that user can specify how many questions max to ask (and test will adjust)

• Week 2 spring quarter:
  • Improve code through testing (answer some of the questions on the previous slide by comparing results)

• Week 3 – 4 spring quarter:
  • Conduct testing at middle school to see how well the test works

• By week 6 spring quarter:
  • Have results analyzed and more changes to reflect results