The BUGGY Game

Find a partner. With your partner, find another pair to make a group of 4. One pair will play the BUGGY system. One pair are teachers-in-training.

Instructions for the TEACHERS pair:

By setting problems for the system to solve using a student's "buggy" addition or subtraction procedure, you will gather evidence to test your group's theory about this bug. **The system can tell you if you have the right bug or not, but cannot give more specific feedback.**

Teachers:
1. Study the starting example and agree an initial hypothesis about the student's buggy procedure.
2. Generate 2 sample problems to test this hypothesis. Try to choose problems that are strategic and would help to support or refute your hypothesis. *Do not just choose random numbers to add or subtract!*
3. Give these to the system to solve, using the "buggy" procedure
4. While the system works, predict what you think the answers will be.
5. Study the answers you get back. Do they agree with your predictions, based on the hypothesis? Choose whether to: Then ask teachers to either:
   a) Present system with your theory about the buggy procedure
   b) Get more evidence by posing 1-2 more sample problems, and *then* giving theory after getting those answers.
6. If the system says your bug theory is right, you are done! Proceed to discussion questions.
7. If they have not found the bug, ask for more sample problems.
   a) Before answering, compare these samples to the original ones.
   b) Are these samples very similar, or different enough that the teachers might learn some information? You might look at how many digits are involved, whether there are zeros, etc.
   c) If the samples are all very similar, try prompting them to try something different (without suggesting an exact problem to try).
8. **Repeat steps 4-7 until students find the correct bug theory, or time is up.**

Starting Example:

$$143$$
$$- 28$$

$$125$$

Buggy procedure 3 of 3

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Starting Example:

$$1300$$
$$- 522$$
$$--------$$
$$878$$

Buggy procedure 3 of 3

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   c) If the samples are all very similar, try prompting them to try something different (without suggesting an exact problem to try).
8. **Repeat steps 4-7 until students find the correct bug theory, or time is up.**

Starting Example:

$$
\begin{array}{r}
17 \\
+\,5 \\
\hline
13
\end{array}
$$

Buggy procedure 3 of 3