

## Go

Your name:

By the time you are done with this activity, you should be able to:

- use classes and interfaces from the Java Collections Framework, including Stack and Set.
- use a stack to represent state history for undoing.
- debug using unit tests.

After you complete this activity, please fill out the short survey at

<http://goo.gl/forms/HXjyuUb2ou>

to improve this project for future users.

## Playing the game

Included in the Go project is a file `Go.jar`. This is a compiled version of the working game. To play it, use a terminal to navigate to the directory containing the file and type this on the command line:

```
java -jar Go.jar
```

*Go*, arguably the oldest strategy game in the world, was invented in China 3,000-5,000 years ago. It is known as *Weiqi* in China, *Igo* in Japan, and *Baduk* in Korea. While the rules are simpler than those of *Chess*, top human *Go* players were able to beat all computer programs until 2016. The AlphaGo program's victory over Lee Sedol is considered a milestone in artificial intelligence research.

This is a two-player game. Play a couple of games with another student. Board width 5 is fine for learning the rules. Larger boards make for more interesting but longer games; playing on the standard width 19 board can take over an hour.

Note to experienced *Go* players: to keep the program simple, this program uses Chinese scoring. No attempt is made at the end of the game to remove “dead” stones; if you think you can capture something, do it!

## Debugging with JUnit

You have been given a complete program, but it contains some bugs. Specifically, some of the methods in `GoModel.java` do not quite work correctly.

You have been given a JUnit test class `GoModelTestHighLevel.java`. This test currently fails because of the bugs.

Write a new class, `GoModelTest.java`, testing each of the methods in `GoModel.java`. You may end up testing more than one method with a single test or creating multiple tests for one method.

Find and eliminate the bugs so that `GoModelTestHighLevel.java` passes.

The number of bugs is more than one and less than ten. Each can be fixed by modifying a single line of code.

Take notes as you work. What bugs and conceptual difficulties did you encounter? How did you overcome them? What did you learn?

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