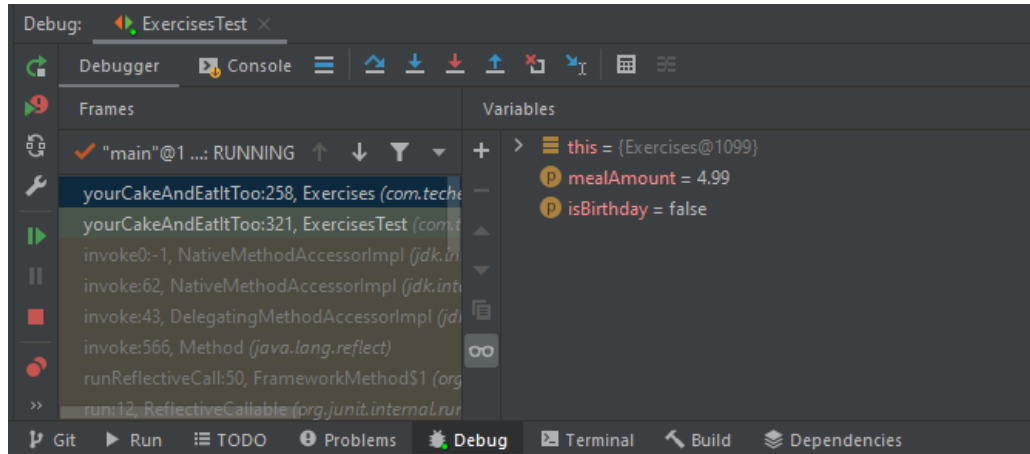# Troubleshooting and Debugging

Use the Debugger

- spend time practicing with working code
- explore its features
- practice stepping through code
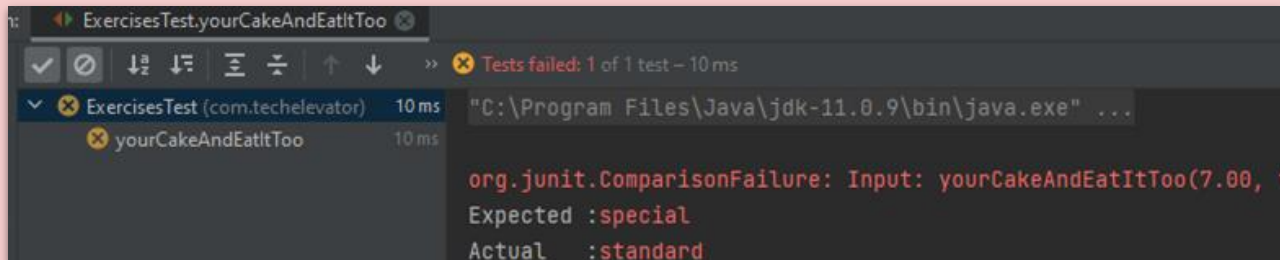- practicing setting breakpoints

Read Error Messages

```
== true) {
= mealAmounts + 5;
    Cannot resolve symbol 'mealAmounts'                              ⋮
    Create local variable 'mealAmounts'  Alt+Shift+Enter   More actions...  Alt+Enter
```

Compile Time Errors

Test Case Assertion Errors

```
◀▶ ExercisesTest.yourCakeAndEatItToo ⊗
✓ ⊘ ↧ᵃ ↧ᶻ ⊼ ⊻ ↑ ↓  » ⊗ Tests failed: 1 of 1 test – 10 ms
∨ ⊗ ExercisesTest (com.techelevator)  10 ms   "C:\Program Files\Java\jdk-11.0.9\bin\java.exe" ...
    ⊗ yourCakeAndEatItToo           10 ms
                                                org.junit.ComparisonFailure: Input: yourCakeAndEatItToo(7.00,
                                                Expected :special
                                                Actual   :standard
```

```
"C:\Program Files\Java\jdk-11.0.9\bin\java.exe" ...

java.lang.NullPointerException  Create breakpoint
    at com.techelevator.Exercises.yourCakeAndEatItToo(Exercises.java:251)
    at com.techelevator.ExercisesTest.yourCakeAndEatItToo(ExercisesTest.java:321) <22 internal lines>
```

Runtime Errors

Explain it to the Duck

Use Timeboxing

Estimate how long the problem should take.

↓

Set a Timer

↓

Work until you complete the problem or the timer goes off

↓

If the timer goes off before you are done. Ask for help or move on to something else.

Walk Away for a While

- Work on something else
- Relax
- Take a break
- Take a walk
- Do some exercise
- Get some sleep

Don't get attached to your code.
Throw it away

Start again fresh

Other tips

Make small, simple incremental changes

Don't assume because something doesn't work it wasn't partially correct

Test in your head

Ask another programmer to take a look