

## Studio 04 - Exceptions & Tests for the Bootstrap

Today you'll practice collaborative development by implementing bootstrap confidence intervals. Working in pairs, you'll write functions that must work together and test each other's code.

### Lab Exercise

- 1- As a class, we'll write docstrings for three functions: `bootstrap_sample`, `bootstrap_ci`, and `r_squared`. This establishes the interface contract that both partners must follow.
- 2- Work in pairs to write one integration test together that uses all three functions. Create a shared repo that you'll both push to.
- 3- Split responsibilities:
  - **Student A:** Write tests for `bootstrap_ci` and `r_squared`, and then implement `bootstrap_sample`
  - **Student B:** Write tests for `bootstrap_sample`, and then implement `bootstrap_ci` and `r_squared`
- 4- Run all tests together. Debug collaboratively when tests fail.
- 5- *Bonus:* Add a statistical validation test that checks your bootstrap implementation against the known theoretical distribution of  $R^2$  under the null hypothesis.
- 6- Push your work to GitHub and submit the repository URL. Your test suite should check for the happy path, edge cases, invalid inputs, and statistical validation.

### Files to create

- `bootstrap.py` - your function implementations
- `test_bootstrap.py` - your comprehensive test suite