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## HW9: Unit Testing

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### The Weekly Kata Solution: Basic Statement Coverage in Unit Testing ([5fad5be0ff1ef6000f928448](https://github.com/OU-CS3560/hw9-unit-testing-s22-23-hc219417))

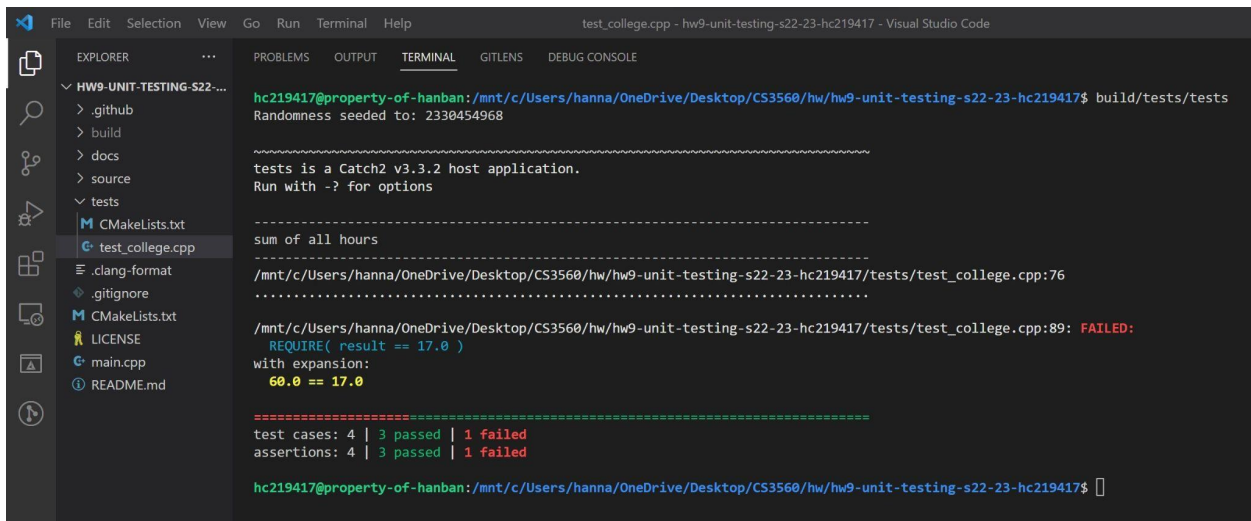
```
// Test the count_ballot() function thoroughly. There is nothing to return.
// Your function should do all the calls to the `count_ballot()` function needed to
// obtain full statement coverage for this function as listed in the problem description.
// This function takes one parameter - ballot, which is a string that contains
// the name of the person that was voted for
//
// Test coverage will be measured automatically.
void test_count_ballot(std::string (*count_ballot)(std::string s)) {
    count_ballot("trump & biden"); //should return "Invalid"
    count_ballot("trump"); //should return "Trump"
    count_ballot("biden"); //should return "Biden"
    count_ballot("green"); //should return "Green"
    count_ballot(""); //should return "None"
}
```

**URL to the Repository:** This section should have your GitHub Classroom repository URL for this homework.

<https://github.com/OU-CS3560/hw9-unit-testing-s22-23-hc219417>

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**Test Outputs:** This section should show a screenshot of the output of running the test program, build/tests/tests.



```
test_college.cpp - hw9-unit-testing-s22-23-hc219417 - Visual Studio Code
EXPLORER  PROBLEMS  OUTPUT  TERMINAL  GITLENS  DEBUG CONSOLE
HW9-UNIT-TESTING-S22-...
  > .github
  > build
  > docs
  > source
  > tests
    CMakeLists.txt
    test_college.cpp
    .clang-format
    .gitignore
    CMakeLists.txt
    LICENSE
    main.cpp
    README.md

hc219417@property-of-hanban: /mnt/c/Users/hanna/OneDrive/Desktop/CS3560/hw/hw9-unit-testing-s22-23-hc219417$ build/tests/tests
Randomness seeded to: 2330454968

~~~~~
tests is a Catch2 v3.3.2 host application.
Run with -? for options

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sum of all hours
-----
/mnt/c/Users/hanna/OneDrive/Desktop/CS3560/hw/hw9-unit-testing-s22-23-hc219417/tests/test_college.cpp:76
-----

/mnt/c/Users/hanna/OneDrive/Desktop/CS3560/hw/hw9-unit-testing-s22-23-hc219417/tests/test_college.cpp:89: FAILED:
  REQUIRE( result == 17.0 )
with expansion:
  60.0 == 17.0

=====
test cases: 4 | 3 passed | 1 failed
assertions: 4 | 3 passed | 1 failed

hc219417@property-of-hanban: /mnt/c/Users/hanna/OneDrive/Desktop/CS3560/hw/hw9-unit-testing-s22-23-hc219417$
```

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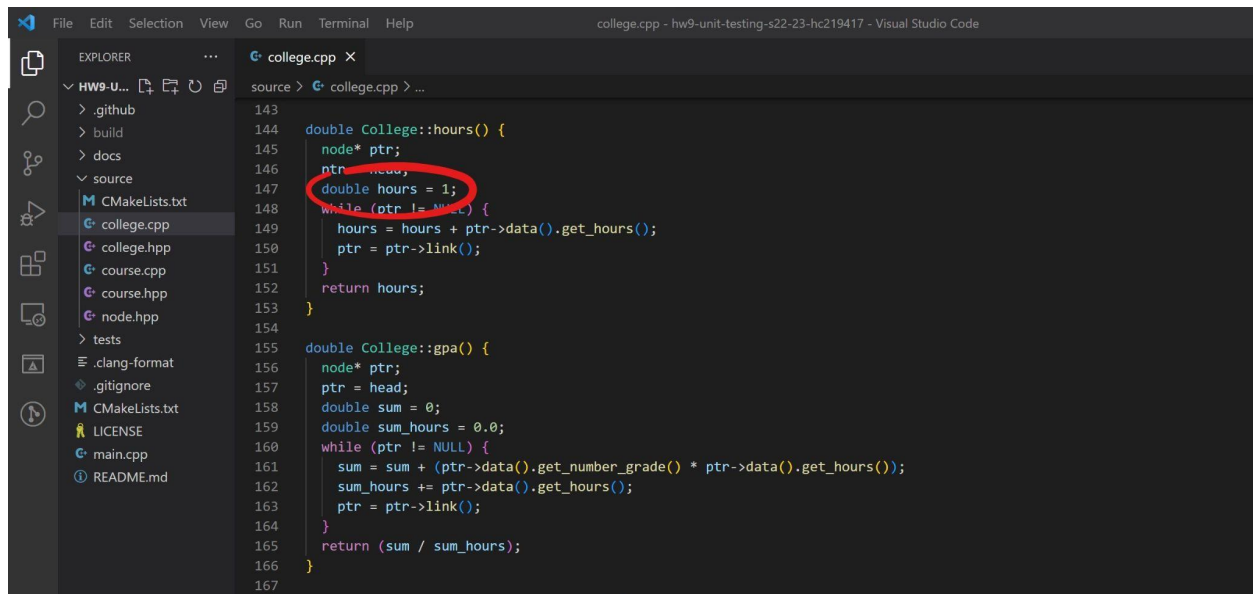
**Reasoning Writeup:** This section should contain written answers that describe the reason for each of the three test cases.

Test Case 1	gpa should not be negative, so this test case tests if the gpa is greater than or equal to 0.0
Test Case 2	the minimum gpa requirement for htc students is 3.5, so this test case tests if the gpa is greater than or equal to 3.5
Test Case 3	gpa should not exceed 4.0, so this test case tests for if the gpa is less than or equal to 4.0

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**Bug Description:** This section should contain a description of the bug and a screenshot with the line that caused the bug underlined or highlighted.

hours is initialized as 1 instead of 0 (circled in red), so an extra hour is being added to the total



```
143
144 double College::hours() {
145     node* ptr;
146     ptr = head;
147     double hours = 1;
148     while (ptr != NULL) {
149         hours = hours + ptr->data().get_hours();
150         ptr = ptr->link();
151     }
152     return hours;
153 }
154
155 double College::gpa() {
156     node* ptr;
157     ptr = head;
158     double sum = 0;
159     double sum_hours = 0.0;
160     while (ptr != NULL) {
161         sum = sum + (ptr->data().get_number_grade() * ptr->data().get_hours());
162         sum_hours += ptr->data().get_hours();
163         ptr = ptr->link();
164     }
165     return (sum / sum_hours);
166 }
167
```