

CS-405 Secure Coding – Module 4 Milestone

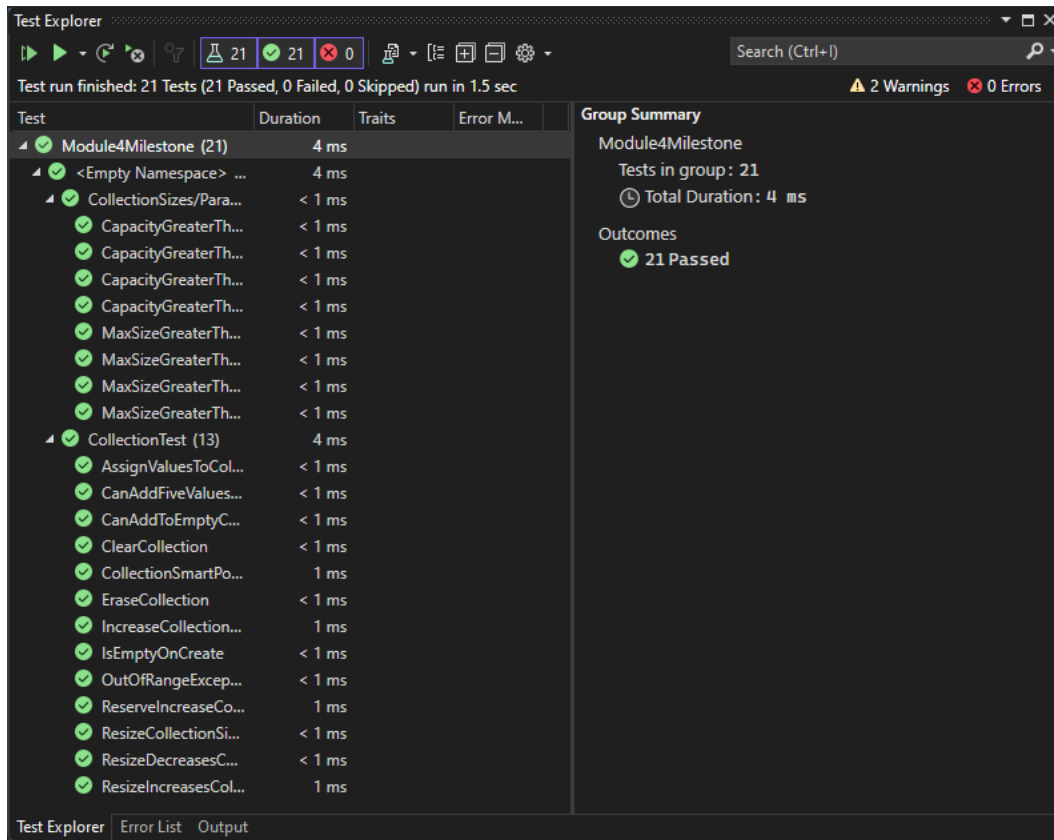
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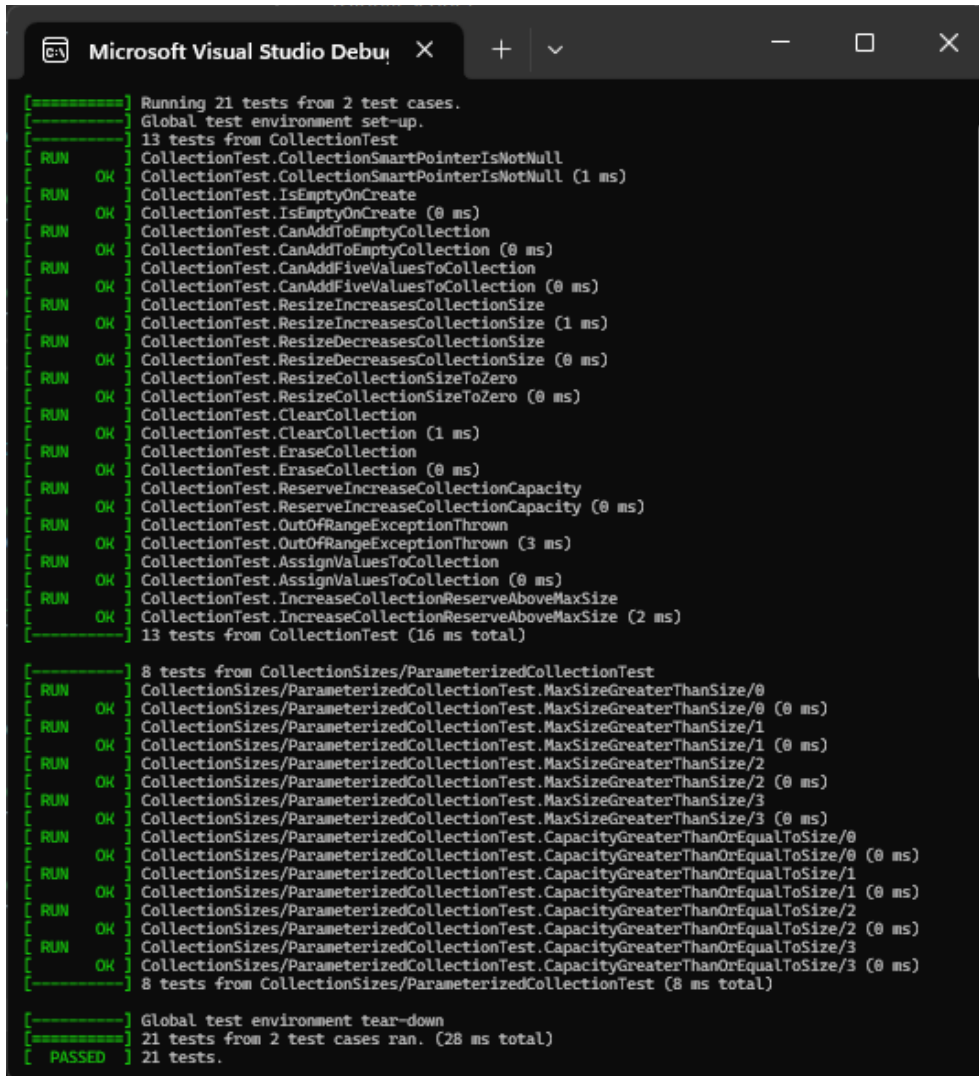
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## Module Four Milestone

### Unit testing test explorer screenshot



## Unit testing results screenshot



```
[=====] Running 21 tests from 2 test cases.
[=====] Global test environment set-up.
[=====] 13 tests from CollectionTest
[ RUN      ] CollectionTest.CollectionSmartPointerIsNotNull
[ OK       ] CollectionTest.CollectionSmartPointerIsNotNull (1 ms)
[ RUN      ] CollectionTest.IsEmptyOnCreate
[ OK       ] CollectionTest.IsEmptyOnCreate (0 ms)
[ RUN      ] CollectionTest.CanAddToEmptyCollection
[ OK       ] CollectionTest.CanAddToEmptyCollection (0 ms)
[ RUN      ] CollectionTest.CanAddFiveValuesToCollection
[ OK       ] CollectionTest.CanAddFiveValuesToCollection (0 ms)
[ RUN      ] CollectionTest.ResizeIncreasesCollectionSize
[ OK       ] CollectionTest.ResizeIncreasesCollectionSize (1 ms)
[ RUN      ] CollectionTest.ResizeDecreasesCollectionSize
[ OK       ] CollectionTest.ResizeDecreasesCollectionSize (0 ms)
[ RUN      ] CollectionTest.ResizeCollectionSizeToZero
[ OK       ] CollectionTest.ResizeCollectionSizeToZero (0 ms)
[ RUN      ] CollectionTest.ClearCollection
[ OK       ] CollectionTest.ClearCollection (1 ms)
[ RUN      ] CollectionTest.EraseCollection
[ OK       ] CollectionTest.EraseCollection (0 ms)
[ RUN      ] CollectionTest.ReserveIncreaseCollectionCapacity
[ OK       ] CollectionTest.ReserveIncreaseCollectionCapacity (0 ms)
[ RUN      ] CollectionTest.OutOfRangeExceptionThrown
[ OK       ] CollectionTest.OutOfRangeExceptionThrown (3 ms)
[ RUN      ] CollectionTest.AssignValuesToCollection
[ OK       ] CollectionTest.AssignValuesToCollection (0 ms)
[ RUN      ] CollectionTest.IncreaseCollectionReserveAboveMaxSize
[ OK       ] CollectionTest.IncreaseCollectionReserveAboveMaxSize (2 ms)
[=====] 13 tests from CollectionTest (16 ms total)

[=====] 8 tests from CollectionSizes/ParameterizedCollectionTest
[ RUN      ] CollectionSizes/ParameterizedCollectionTest.MaxSizeGreaterThanSize/0
[ OK       ] CollectionSizes/ParameterizedCollectionTest.MaxSizeGreaterThanSize/0 (0 ms)
[ RUN      ] CollectionSizes/ParameterizedCollectionTest.MaxSizeGreaterThanSize/1
[ OK       ] CollectionSizes/ParameterizedCollectionTest.MaxSizeGreaterThanSize/1 (0 ms)
[ RUN      ] CollectionSizes/ParameterizedCollectionTest.MaxSizeGreaterThanSize/2
[ OK       ] CollectionSizes/ParameterizedCollectionTest.MaxSizeGreaterThanSize/2 (0 ms)
[ RUN      ] CollectionSizes/ParameterizedCollectionTest.MaxSizeGreaterThanSize/3
[ OK       ] CollectionSizes/ParameterizedCollectionTest.MaxSizeGreaterThanSize/3 (0 ms)
[ RUN      ] CollectionSizes/ParameterizedCollectionTest.CapacityGreaterThanOrEqualToSize/0
[ OK       ] CollectionSizes/ParameterizedCollectionTest.CapacityGreaterThanOrEqualToSize/0 (0 ms)
[ RUN      ] CollectionSizes/ParameterizedCollectionTest.CapacityGreaterThanOrEqualToSize/1
[ OK       ] CollectionSizes/ParameterizedCollectionTest.CapacityGreaterThanOrEqualToSize/1 (0 ms)
[ RUN      ] CollectionSizes/ParameterizedCollectionTest.CapacityGreaterThanOrEqualToSize/2
[ OK       ] CollectionSizes/ParameterizedCollectionTest.CapacityGreaterThanOrEqualToSize/2 (0 ms)
[ RUN      ] CollectionSizes/ParameterizedCollectionTest.CapacityGreaterThanOrEqualToSize/3
[ OK       ] CollectionSizes/ParameterizedCollectionTest.CapacityGreaterThanOrEqualToSize/3 (0 ms)
[=====] 8 tests from CollectionSizes/ParameterizedCollectionTest (8 ms total)

[=====] Global test environment tear-down
[=====] 21 tests from 2 test cases ran. (28 ms total)
[ PASSED  ] 21 tests.
```

## Summary of unit testing process

All of the unit tests that were created were appropriately named to convey what each specific test is attempting to verify. Each unit test used EXPECT to ensure that everything was set up correct for the test. Then ASSERT was used to test and verify the specific condition of the test. In some cases, a negative unit test was performed that the test will fail as expected in certain scenarios. C++ programming functionality and

best practices were followed with documenting the code and utilizing test fixtures in some cases and parameterized test fixtures. Throughout this process of testing, it was able to find issues with divide by zero, length issues, and out of bounds issues.