Practice Problem: Namespaces and Header Organization in C++

CSE3150

Requirements

1. Create a namespace `MathUtils` in its own file with:

   - `int add(int a, int b)` returning the sum
   - `int multiply(int a, int b)` returning the product

2. Create a namespace `AdvancedMath` in its own file with:

   - `int square(int n)` returning the square. This should call the MathUtils multiply.

3. Put declarations into header files and definitions into `.cpp` files.

4. Write a `main.cpp` that uses both namespaces and prints results.

5. Place your headers in a folder called `include`, and the cpp files in a folder called `src`.

6. Put this in a repo called `cse3150_week_1_hw` in your GitHub.

7. Make sure you don't push any executables to GitHub.

8. Make sure to test your code with pytest before pushing.

9. Put your github URL here `https://docs.google.com/spreadsheets/d/15_8dN8y86iE6rLXSglO3UFzlU_YcgQ4KFOJqj5gJi1k/edit?usp=sharing`

Test File (`test_math.py`)

```python
import subprocess

def run_program():
    result = subprocess.run(
        ["./math_program"], capture_output=True, text=True, check=True
    )
    return result.stdout.strip().splitlines()

def test_add_and_multiply_and_square():
    output = run_program()
    assert "a + b = 7" in output[0]
    assert "a * b = 12" in output[1]
    assert "square(a) = 9" in output[2]
```