Assignment 4

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Wrote this assignment in Python with Python's unittest. Also I know this pdf is way extra but trying to learn how to use LaTeX test editor haha

1 Copy of Python function

```
def count_pairs_with_sum(numbers, target):
    count = 0
    seen = set()

    for num in numbers:
        complement = target - num
        if complement in seen:
            count += 1
        seen.add(num)
    return count
```

2 Equivalence Classes

Equivalence classes for testing the `count_pairs_with_sum` function are distinct groups of input scenarios. These classes are disjoint, as each input scenario falls into only one class, and they cover various possibilities for testing the function, ensuring comprehensive test coverage.

3 Copy of Unit Testing

```

import unittest
import assignment4

class TestCountPairs(unittest.TestCase):
    def test_pairs_exist(self):
        self.assertEqual(assignment4.count_pairs_with_sum([1,2,3,4,5], 6), 2)
    def test_no_pairs_exist(self):
        self.assertEqual(assignment4.count_pairs_with_sum([1,2,3,4,5], 10), 0)
    def test_empty_list(self):
        self.assertEqual(assignment4.count_pairs_with_sum([], 5), 0)
    def test_single_element(self):
        self.assertEqual(assignment4.count_pairs_with_sum([1], 1), 0)
    def test_negative_numbers(self):
        self.assertEqual(assignment4.count_pairs_with_sum([-1, -2, 1, 2 , 3], 0), 2)
    def test_duplicates(self):
        self.assertEqual(assignment4.count_pairs_with_sum([1,2,2,3,3,4], 5), 3)
    def test_large_numbers(self):
        self.assertEqual(assignment4.count_pairs_with_sum([1000, 2000, 3000], 3000), 1)
    def test_target_is_zero(self):
        self.assertEqual(assignment4.count_pairs_with_sum([1,2,3,4,5], 0), 0)
if __name__ == '__main__':
    unittest.main()
```

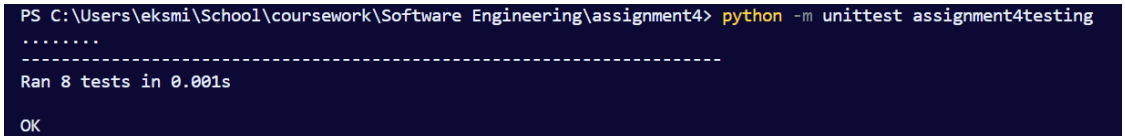

Figure 1: Screenshot of successful execution

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