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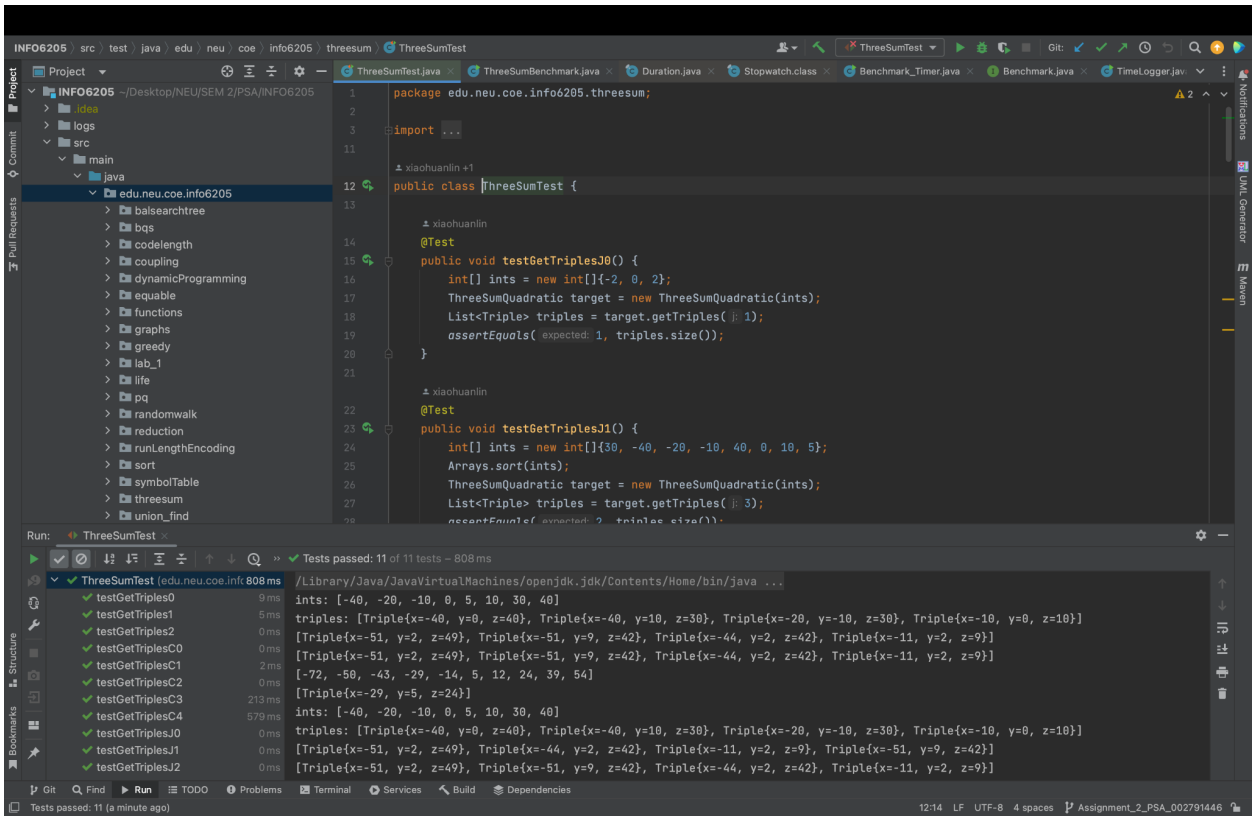
Assignment 1: Report

Explanation of Quadratic Method: Using HashSet

1. We will first Sort array
2. After sorting we move over the pivot element to nums[i] and then analyze the numbers to their right.
3. We find all the pairs that are present to its right and add up to -nums[i], using two pointer method, which will eventually add up to 0 (nums[i] - (num[j]+nums[k]).
4. Add the corresponding pair and pivot element to the final resultant array.

Unit Test Case Result:



Basic Plot					
	Quadratic	Quadratic with Callipers		Quadrithmic	Cubic
N	t(milliseconds)	t(milliseconds)		t(milliseconds)	t(milliseconds)
250	0.79	0.43		0.96	3.12
500	1.32	0.86		2.44	20.66
1000	3.95	2.75		11.3	157.6
2000	15.7	12.3		56.9	1225.4
4000	76.6	73.2		270.4	9713.6
8000	374.33	304.33		1306.33	
16000	1734.5	1592		5463.5	

Logarithmic Plot					
	Quadratic	Quadratic with Callipers		Quadrithmic	Cubic
Log(N)	Log(t)	Log(t)		Log(t)	Log(t)
5.521460918	-0.2357223335	-0.8439700703		-0.04082199452	1.137833002
6.214608098	0.2776317366	-0.1508228897		0.8919980393	3.028199464
6.907755279	1.373715579	1.011600912		2.424802726	5.060060177
7.60090246	2.753660712	2.509599262		4.041295341	7.1110226
8.29404964	4.338597077	4.293195421		5.599902344	9.181282244
8.987196821	5.925137761	5.718112639		7.174976958	
9.680344001	7.458474466	7.372746366		8.605844889	

Graphs from Benchmark: