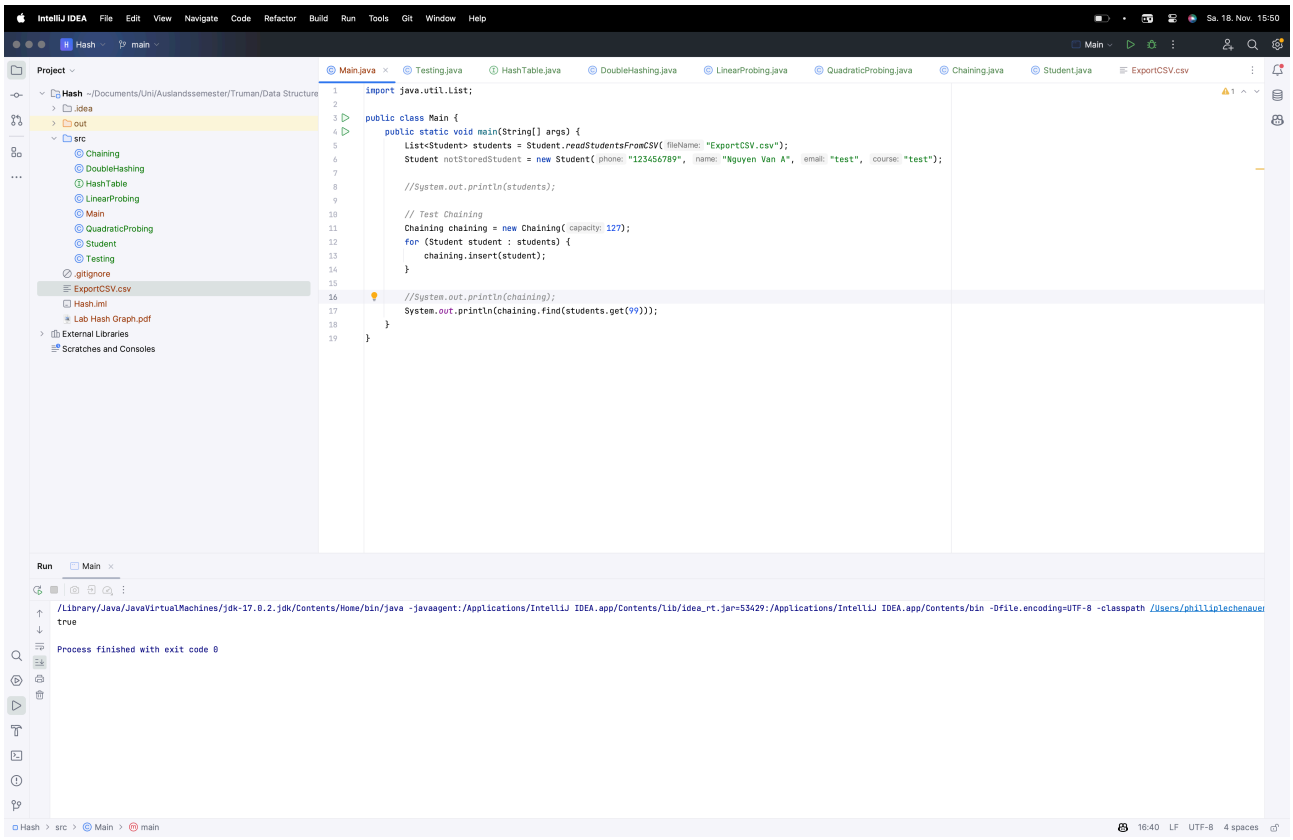
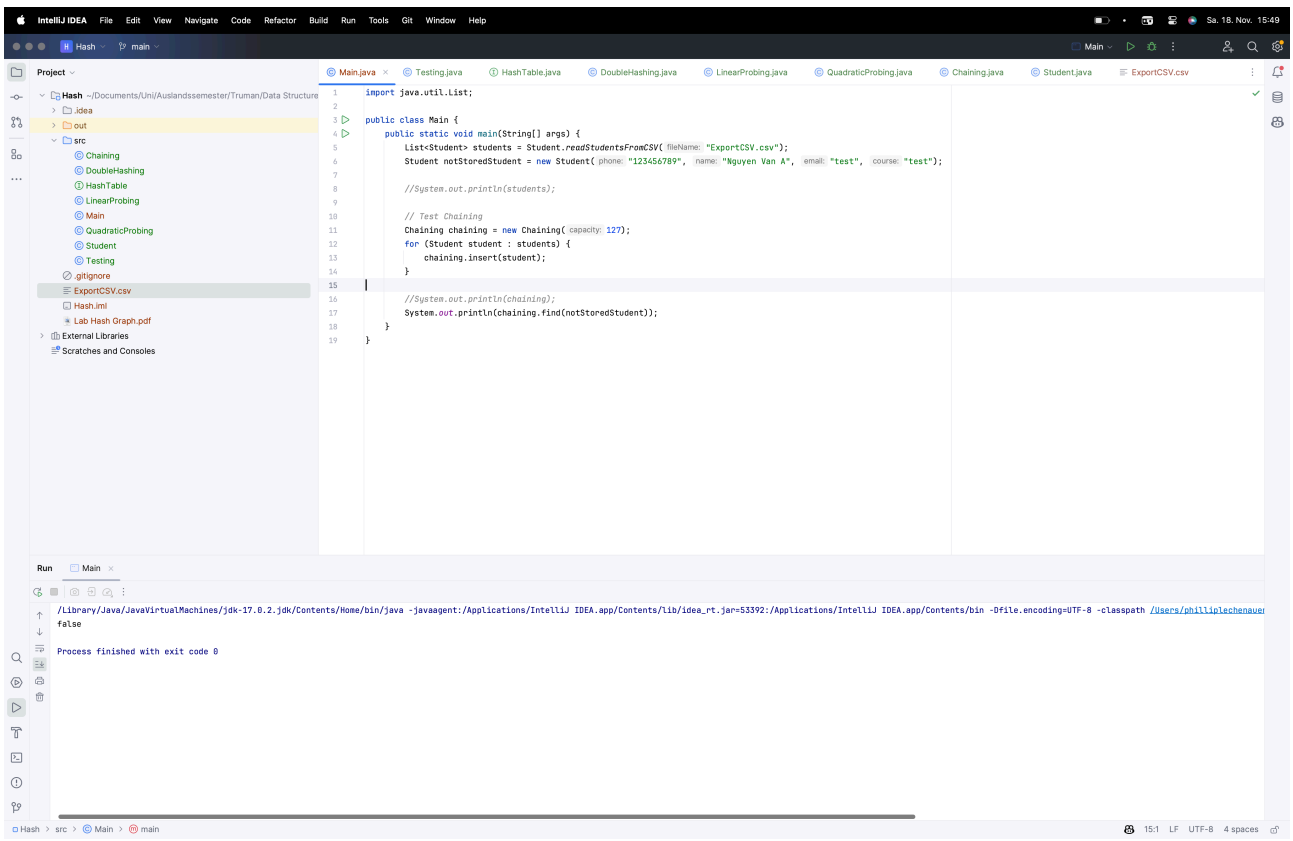
Deliverable 1 - 3

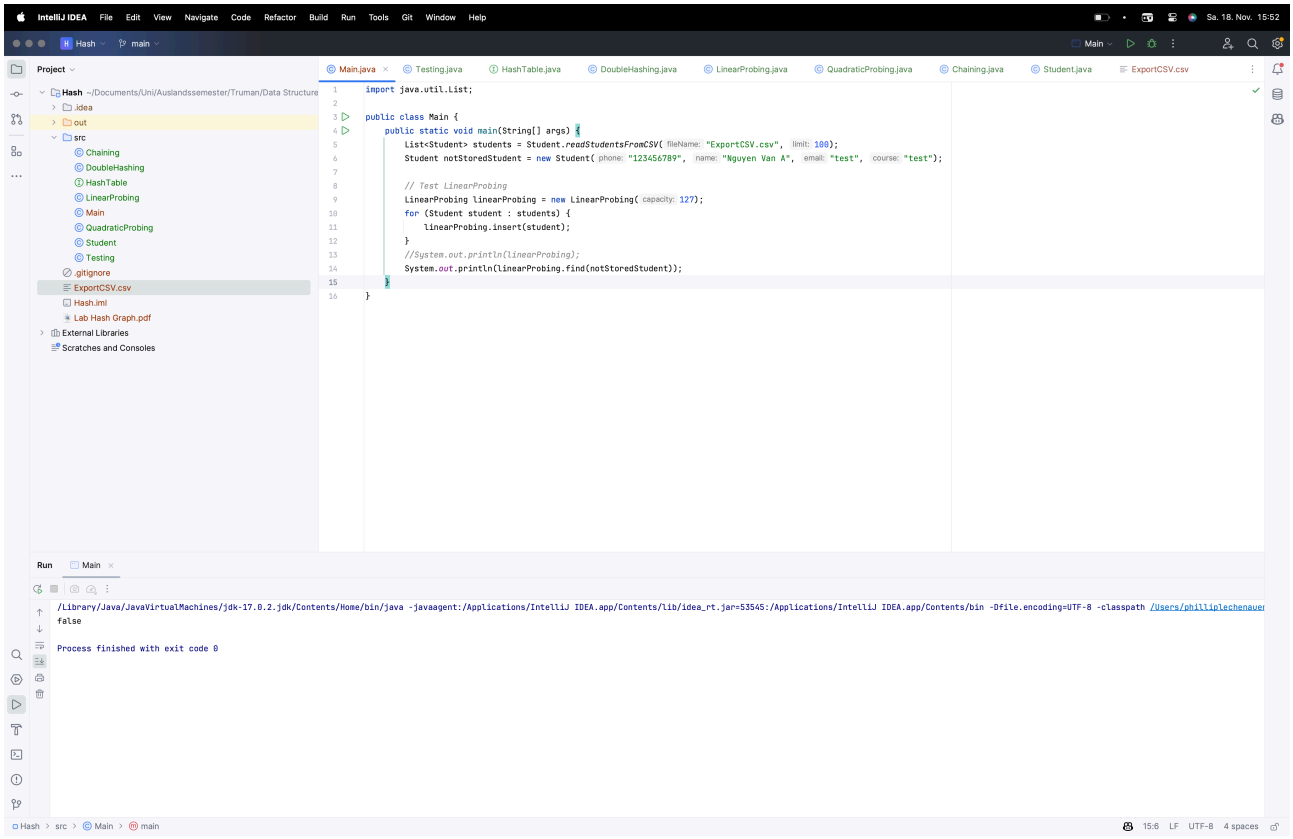
Code

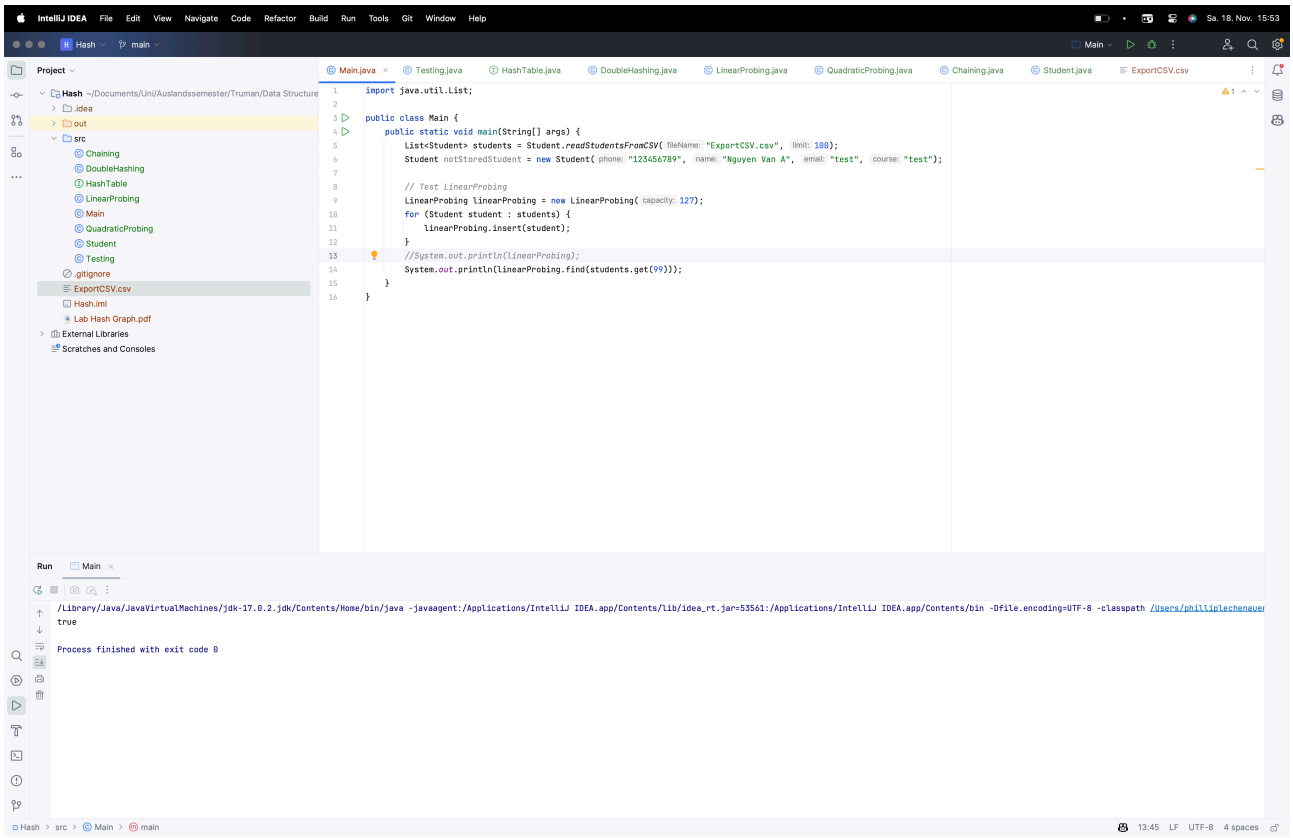
Deliverable 4
Chaining



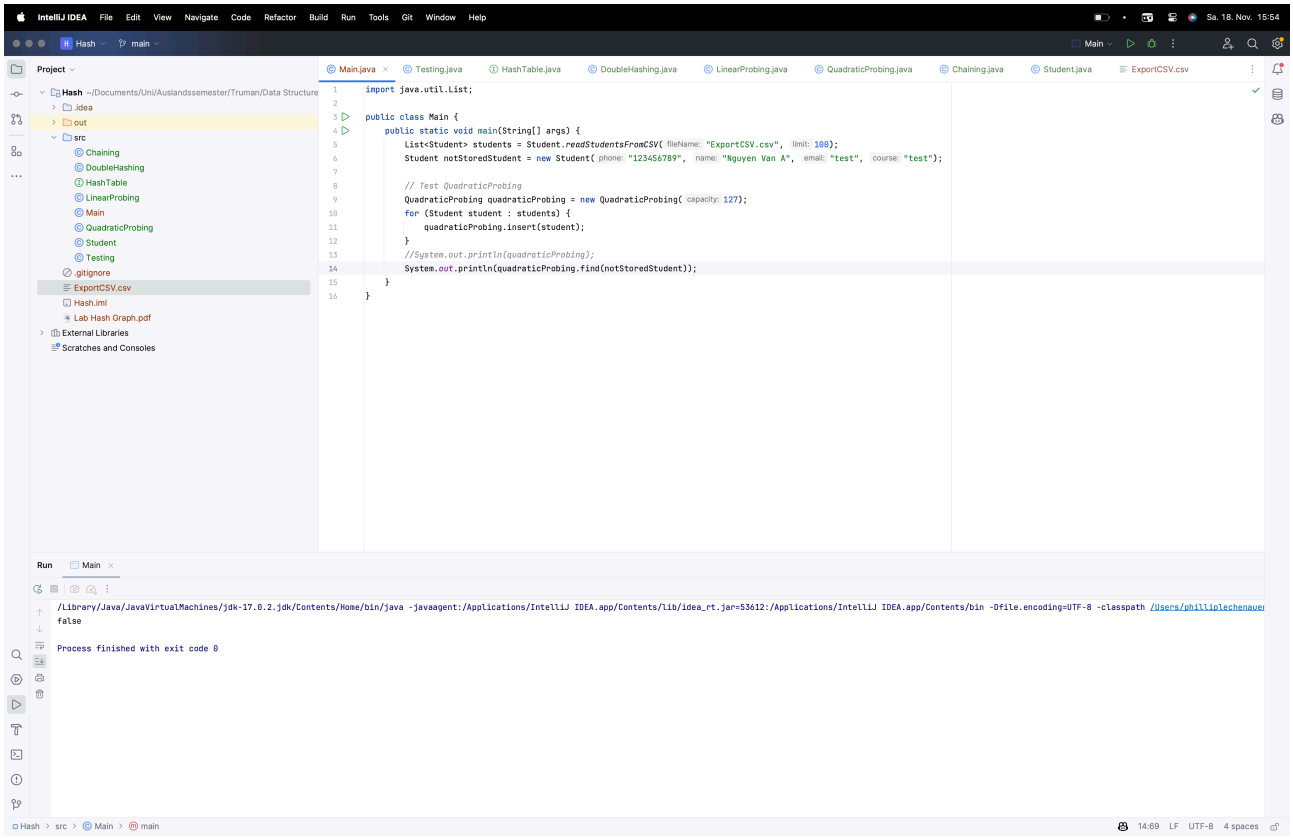


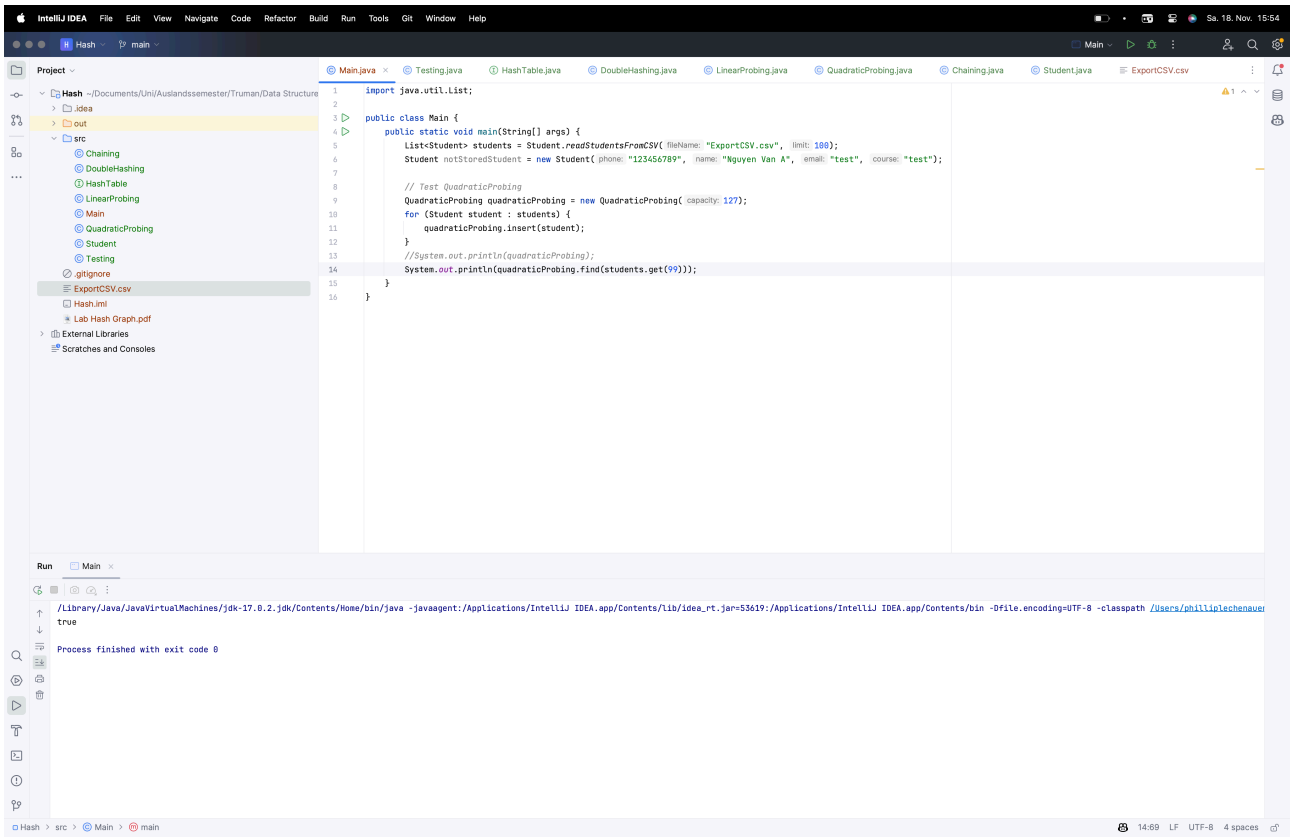
linear Probing



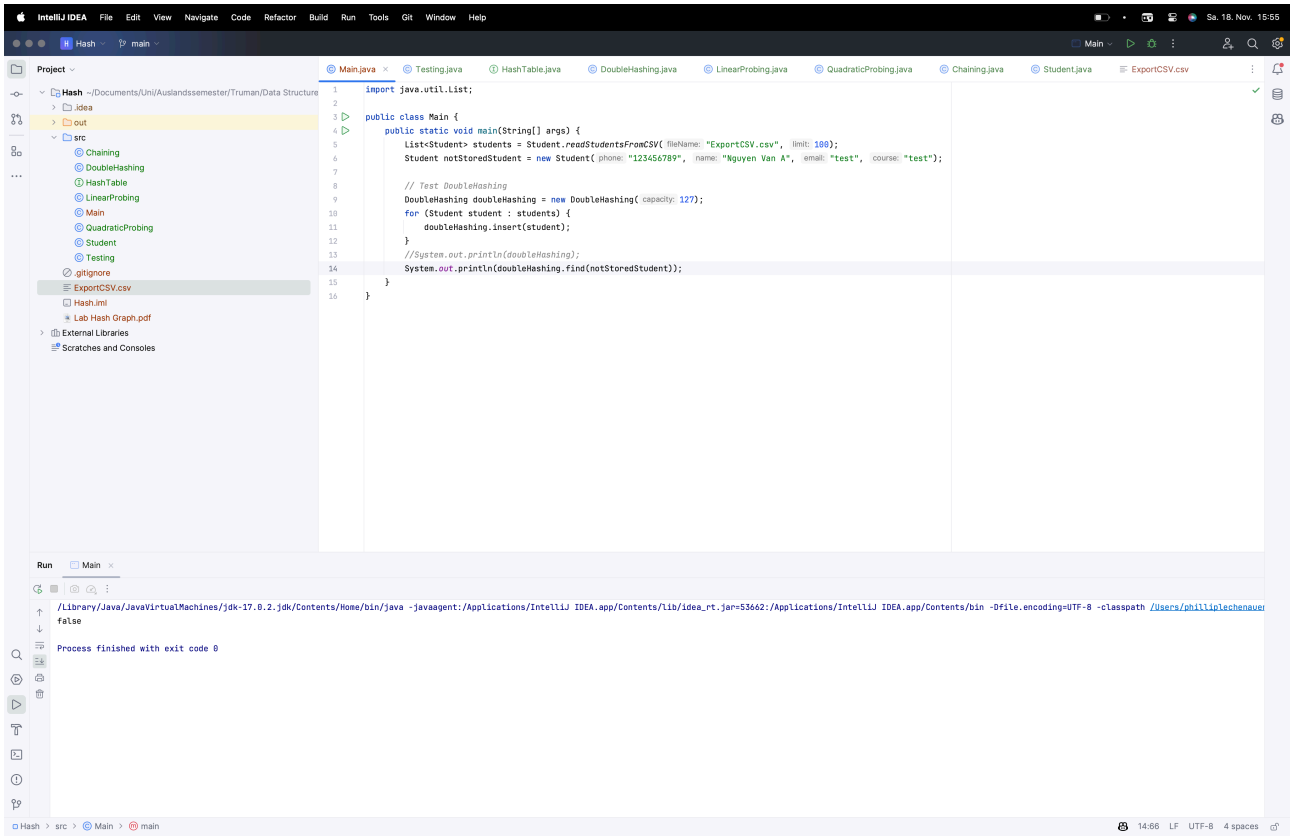


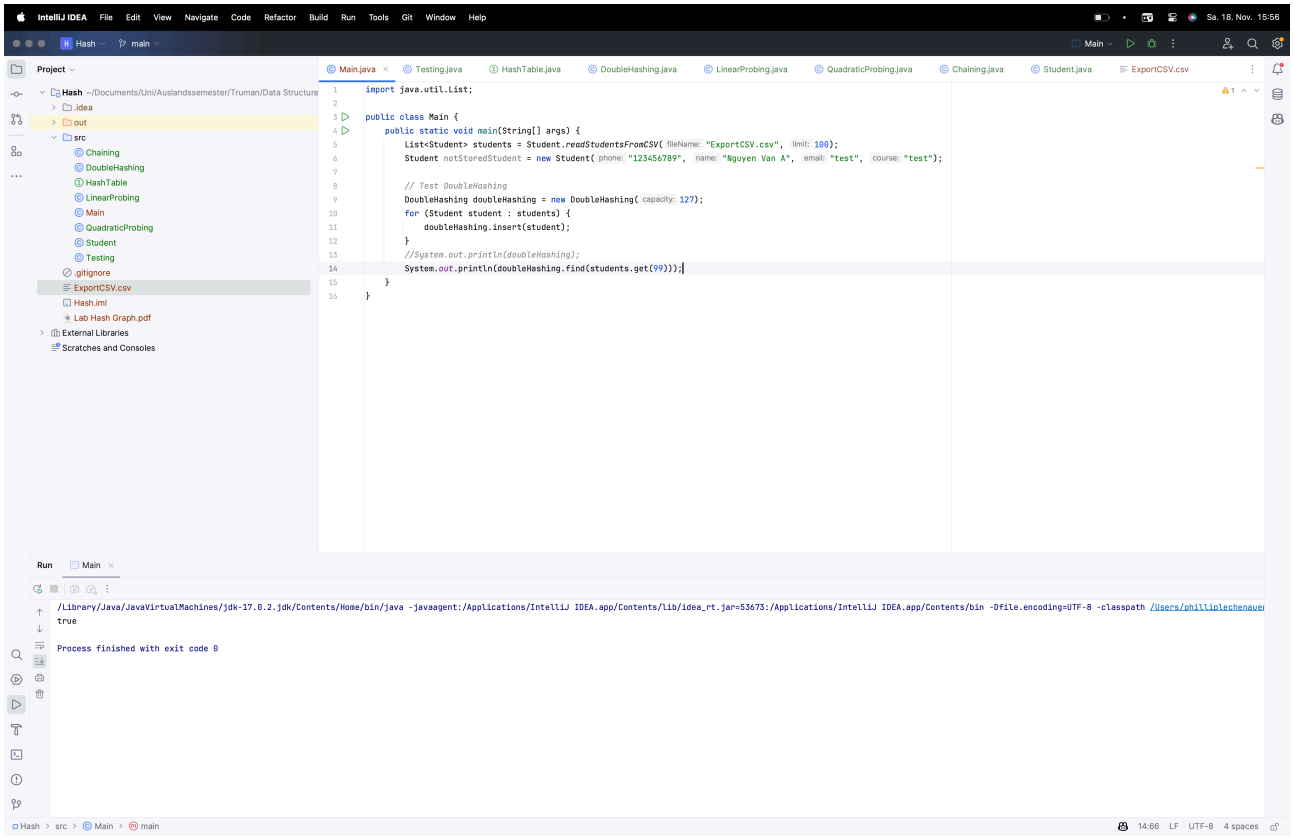
Quadratic Probing





Double Hashing





Deliverable 5:

Chaining

Hashtable size	Input size	insert steps	find steps	total steps	Average Steps
1100	**1000**	1000	1650	2650	1,325
2100	**2000**	2000	3420	5420	1,355
3100	**3000**	3000	5196	8196	1,366
4100	**4000**	4000	6663	10663	1,332875
5100	**5000**	5000	8422	13422	1,3422

Linear Probing

Hashtable size	Input size	insert steps	find steps	total steps	Average Steps
1100	**1000**	12964	43600	56564	28,282
2100	**2000**	46101	360973	407074	101,7685
3100	**3000**	116981	1284596	1401577	233,5961666666
4100	**4000**	109723	1019662	1129385	141,173125
5100	**5000**	312458	3772307	4084765	408,4765

Double Hashing

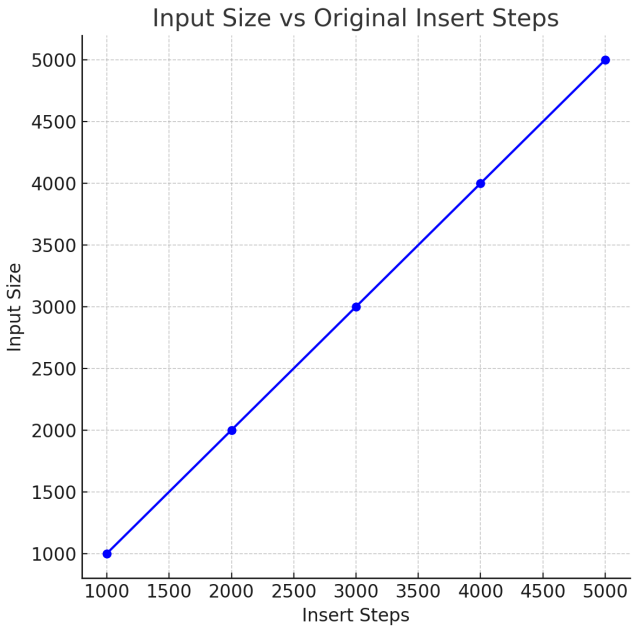
Hashtable size	Input size	insert steps	find steps	total steps	Average Steps
1100	**1000**	78094709	300980328	379075037	189537,5185
2100	**2000**	53697434	1278947102	1332644536	333161,134
3100	**3000**	55435030	570593904	626028934	104338,1556666
4100	**4000**	22107	411520843	411542950	51442,86875
5100	**5000**	56875265	2372158631	2429033896	242903,3896

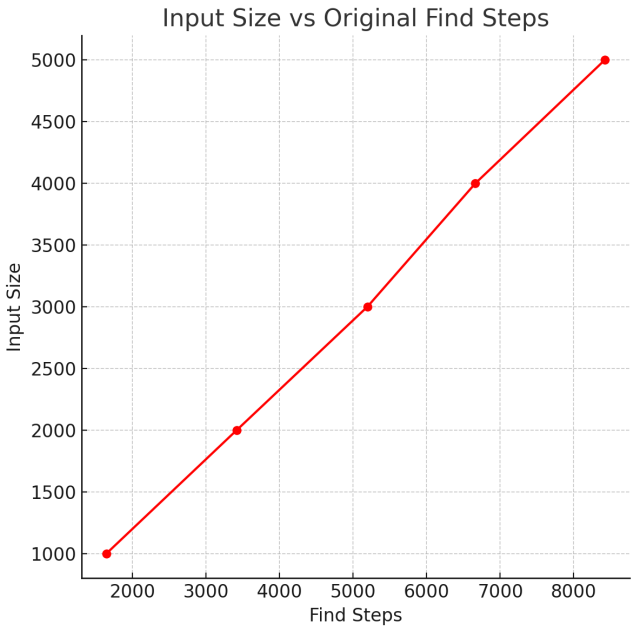
QuadraticProbing

Hashtable size	Input size	insert steps	find steps	total steps	Average Steps
1100	**1000**	4856	8072	12928	6,464
2100	**2000**	10533	28363	38896	9,724
3100	**3000**	17927	67475	85402	14,23366666666
4100	**4000**	24532	108811	133343	16,667875
5100	**5000**	35463	163305	198768	19,8768

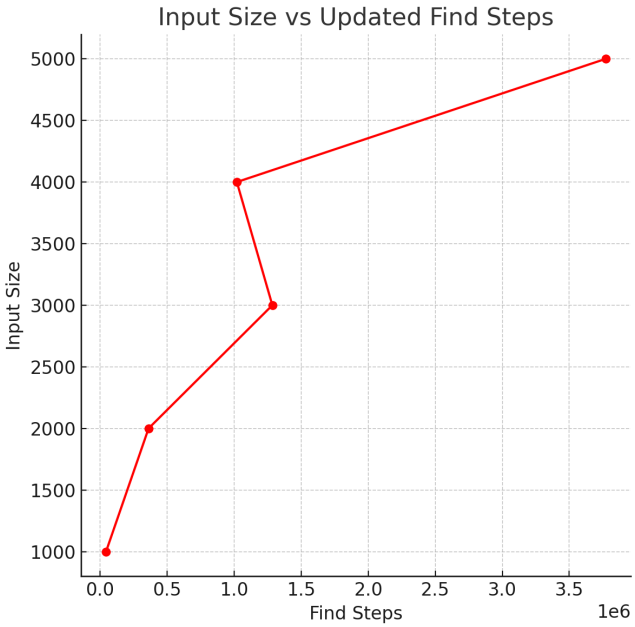
Deliverable 6:

Chaining

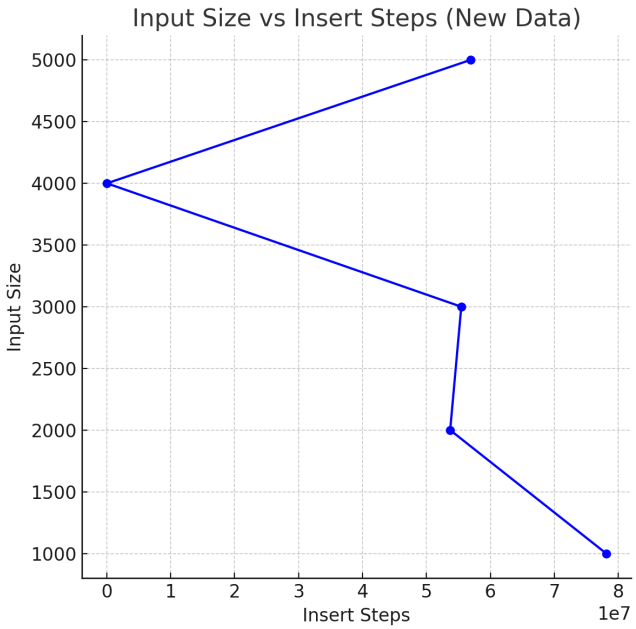


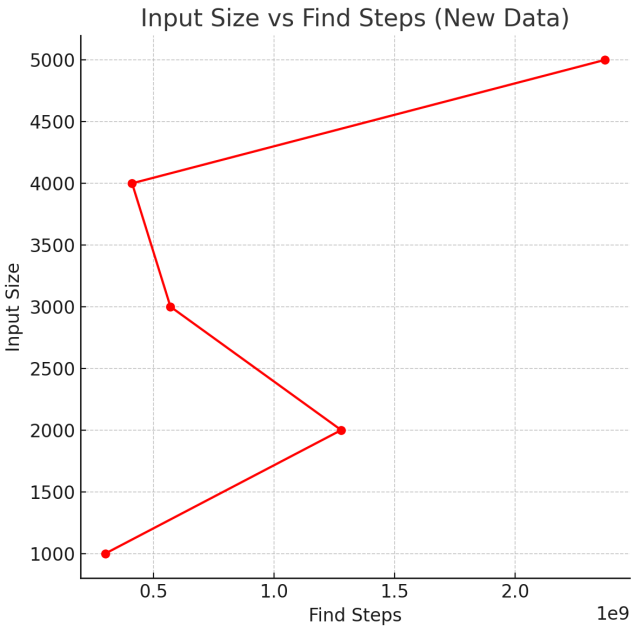


Linear Probing

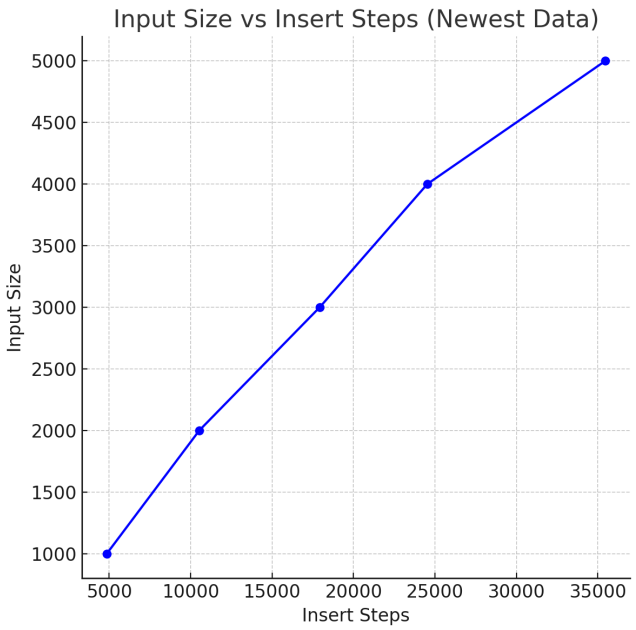


Double Hashing





Quadratic Probing



a) Which hash table algorithm requires the least number of steps to store the Student objects Comment why that is the case.
Chaining, because it just uses the right index and then appends it at the linked list. There is no loop.

b) Which hash table algorithm requires the most number of steps to store the Student objects? Comment why that is the case.
Double Hashing, probably because my second hashing function was poorly designed.

c) Compare the performance of the hash tables when the input size was 1000 compared to 5000.
For most of them the performance got worse

d) Why does the insert algorithm requires more steps to store the objects when the input size is 5000 compared to the input size 1000?
Because we have more elements to place. We also increased the size of the table, but it was always 100 bigger than the input size, wich is 10% for 1000 but only 2% for 5000. Therefore, we have less space.