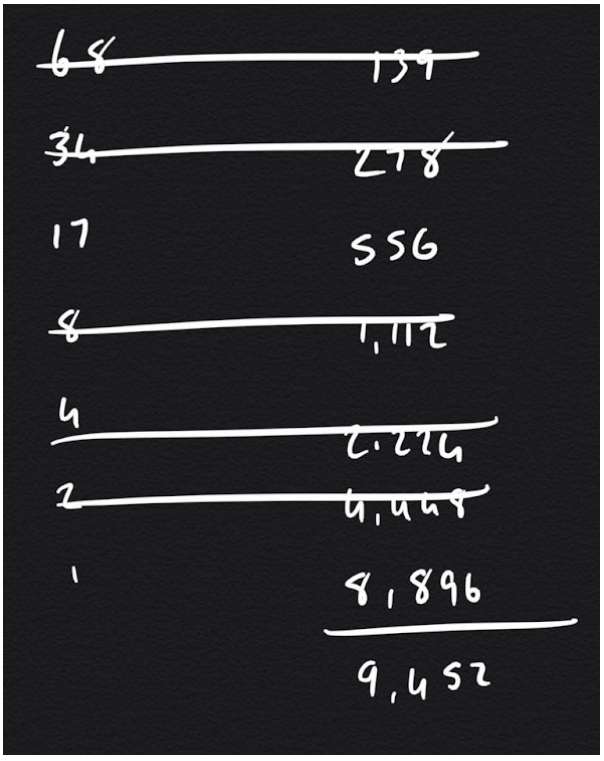
Algorithms - Practical 2 Answers 19300753

Exercise 1:

Your first exercise is to use the Russian Peasant's Algorithm to multiply the following two integers **by hand**:

68 x 139



Exercise 2:

Option A

Number of Digits * 9 (see data)	OptionA Result	Calculator
1	81	81
2	891	891
3	8991	8991
4	89991	89991
5	899991	899991
6	8999991	8999991
7	89999991	89999991
8	899999991	899999991
9	8999999991	8999999991

Option B

Number of Digits * 9	OptionB Result	Calculator

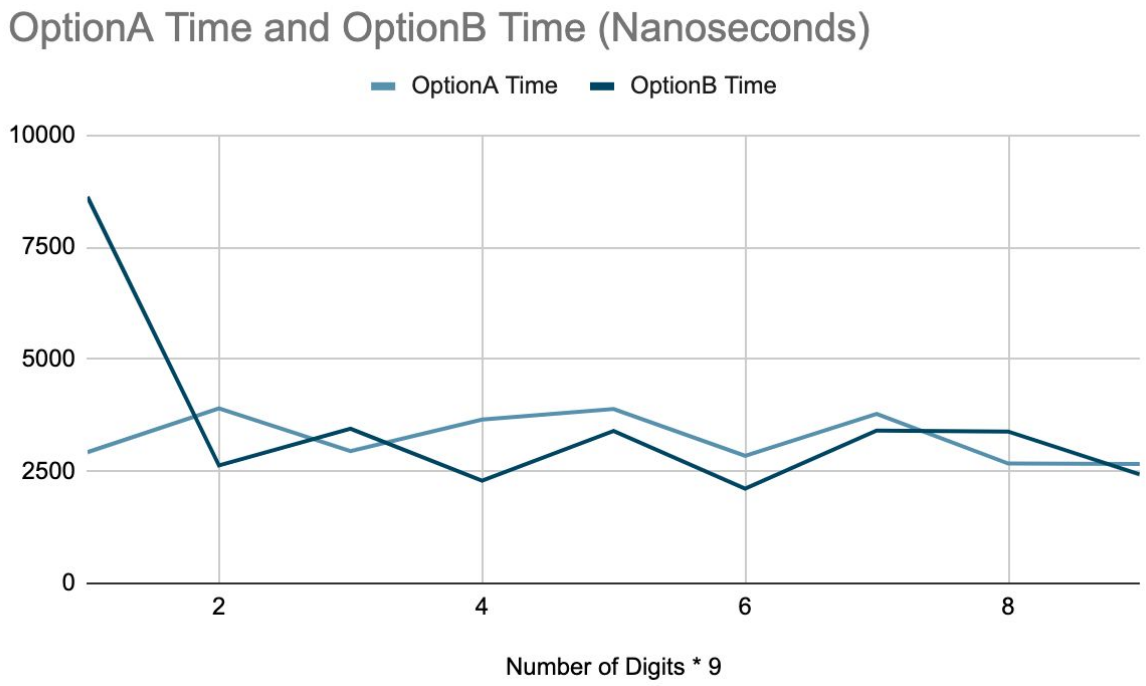
1	81	81
2	891	891
3	8991	8991
4	89991	89991
5	899991	899991
6	8999991	8999991
7	89999991	89999991
8	899999991	899999991
9	8999999991	8999999991

Exercise 3:

To get a very rough idea of how your algorithm performs, add code to time how it performs multiplying numbers of different size. I used nano second to calculate the time elapsed for the results

Number of Digits * 9	OptionA Time	OptionB Time
1	2927	8625
2	3905	2631
3	2952	3453
4	3655	2294
5	3888	3399
6	2843	2111
7	3781	3408
8	2675	3388
9	2664	2433

Graph the results



What do you think is the complexity of your algorithm and why?

- From my observation, the number of digits being multiplied by both algorithms affected the elapsed time unpredictably. There is no clear correlation between the number of digits that had to be multiplied and the time elapsed in nanoseconds