

Hand-in problems 5 for TSTE18 Digital Arithmetic

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The solutions to the hand-in problems should be submitted at most one week after the corresponding seminar to result in prioritized corrections.

These problems should be solved on an **individual** basis. Each student has a consecutive number assigned during the first seminar (or through email contact with the examiner) and should solve the problems using the corresponding data.

Note that the problems should be solved **“by hand”**. Hence, you will need to provide some evidence that you actually solved the problem and not just ran some software for it.

On each sheet of paper write name, personal id number, and student-id, as well as the consecutive number assigned to you.

1 Squarer

Determine the partial products of a four-bit two’s complement squarer using Baugh-Wooley encoding and:

- No partial product reformulation
- Folded partial products
- Partial product recoding to minimize the number of partial products in the highest column

2 Constant multiplication

Derive a shift-and-add network using few adders/subtractors using one of the discussed techniques for the following set of coefficients:

Student no.	Coefficients
1	{5, 234, 165}
2	{3, 11, 56}
3	{118, 35, 5}
4	{186, 92, 200}
5	{113, 113, 15}
6	{16, 26, 153}
7	{64, 215, 219}
8	{246, 126, 59}
9	{60, 138, 195}
10	{91, 119, 164}
11	{234, 44, 183}
12	{149, 112, 226}
13	{102, 48, 163}
14	{160, 86, 205}
15	{255, 250, 35}
16	{62, 9, 156}
17	{31, 106, 226}
18	{141, 96, 56}
19	{114, 244, 34}
20	{122, 219, 14}