1 Excercise 5: BCD Format Adder

Implement a module that receives as inputs two one-digit numbers in Binary-Coded-Decimals (BCD) format and outputs a two-digit number in BCD format.

2 Design Considerations

- BCD digits are comprised of 4 bits with a range of integer values between 0 and 9. Any value outside that range should be considered an error.
- It needs to make a simple addition. Given that the maximum value of the sum is 18, the result will be a 5-bit integer.
- The value of the sum must be returned in BCD format, so the 5-bit integer needs to be split back into 2 BCD digits.

Given these conditions, the module will need:

- 2 4-bit input ports
- 2 4-bit output ports
- 1 ERROR register

3 Code Implementation

The BCD Adder was composed of the following modules:

- 2 BCD format "filters"
- 1 4-bit numbers adder
- 1 BCD format "decoder"

The code implementation for each of the modules can be found in their respective folders.

4 Module Testbench

Testbench results for each of the modules can be found in its respective directory.

5 Conclusions

Each sub-module is working as intended.