Introduction to Application Development in Python

Lecture 4

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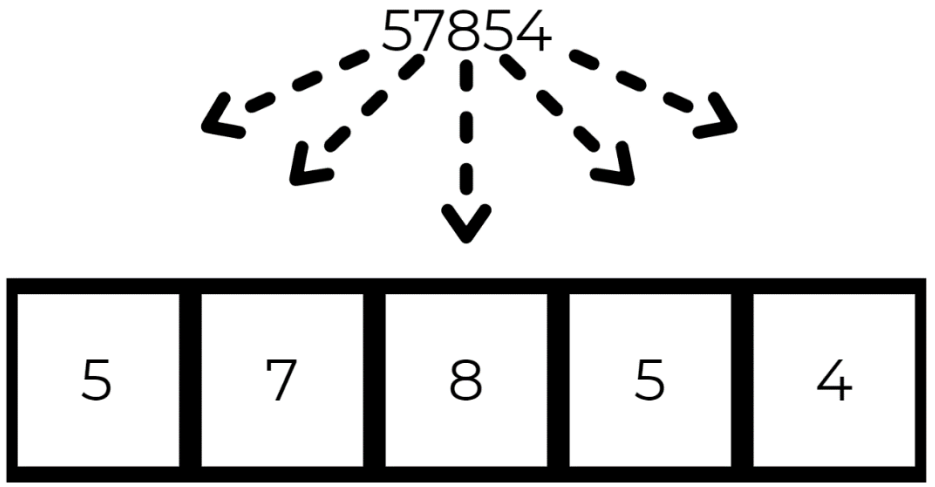
Questions? Previous lecture topics

- String operations
- List operations
- For loop in python
- Typecasting

Lecture topics

- Arithmetic
  - Addition
  - Subtraction
  - Multiplication
  - Division
- Repeat functions from lecture 2 on your own
- Repeat conditions from lecture 2 on your own

Arithmetic: addition



- Numbers consist of digits from 0-9
- If the addition of two digits is **greater than** 9, we need to add **1** to the digit to the left!
  - This is called a **carry**

- In your calculator you have to use the high school method!

Arithmetic: subtraction

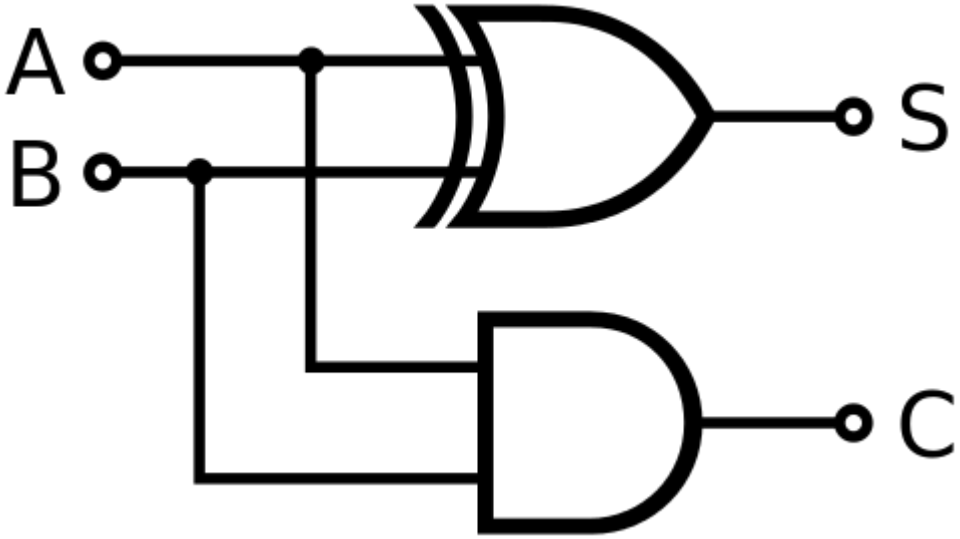
- Similar method for subtraction
  - Instead of a **carry** we will now calculate a **borrow**
  - Borrowing from the digit to the left
- How would you calculate 89765 - 7854 = 81911 in the highschool way?

Arithmetic logic unit processor

- In your CPU what operators will be used to compute addition at its core? (On a bit level)

Arithmetic logic unit processor

- Half adder works with EXOR port & AND port



Inputs		Outputs	
A	**B**	**C**	**S**
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	0

- Full adder needs to be able to add 3 numbers:
  A, B and the carry of the previous addition

Arithmetic: multiplication and division

- How would you do multiplication and division?
  - Hint 1: use the existing functions
  - Hint 2: use loops

Functions & Conditions

- Please repeat Functions and Conditions from lecture 2 again
- Make sure to understand the material before you start

Assignment

- Please see schedule and assignments on course website:
  - Implementation of addition
  - Implementation of subtraction
  - Implementation of multiplication
  - Implementation of division

- Your calculator needs at least to be able to process prefix notation:
  sum x y
  sub x y
  multiply x y
  divide x y

- Deliver assignment **both** in person and automated testing