# 888: LLVM

# Week 3 - LLVM-IR II

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# Exercise - 1 - last week

- Install llvm/clang ?

# Exercise - 1

- Implement a function 'i32 @fib(i32 %n)' that returns the nth fibonacci function using recursive function calls, but no loops.
- What happens if you optimize your fib implementation?
- Can you use this function to calculate arbitrary large fibonacci? What problems may appear? Do you face different problems, if you use a larger integer type?

# Exercise - 2

- Implement a function 'i32 @gcd(i32 %x, i32 %y)' that uses the euclidean algorithm
- What happens if you optimize this function? Do you see any difference? Explain?
- Will increasing the size of the integer type be enough to calculate the gcd of two very large numbers?

# Exercise - 3

- Implement a function 'i32 @sum(i32 %n)' that sums up all integers from 0 to %n using a loop. (Forget about Gauss)
- Derive from this loop a function 'i32 @fib_loop(i32 %n)' that calculates the nth fibonacci number using a loop.
- What happens if you optimize your fib_loop implementation?
- Can you use this function to calculate arbitrary large fibonacci numbers if you use a larger integer type? What problems may appear?