CSC236 fall 2012

correct after & before

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Using Introduction to the Theory of Computation,
Chapter 2
def power(x, y):
    z = 1
    m = 0
    while m < y:
        z = z * x
        m = m + 1
    return z

given precondition?
given postcondition?
notation for mutation
partial correctness
precondition + execution + termination imply postcondition
a loop invariant helps get us closer
partial correctness
precondition + execution + termination imply postcondition
a loop invariant helps get us closer
prove partial correctness
prove termination
associate a decreasing sequence in \( \mathbb{N} \) with loop iterations
it helps to add claims to the loop invariant
put it together — correctness
correctness by design

draw pictures of before, during, after

pre: A sorted, comparable with x

post: $0 \leq p \leq n$ and $A[0..p-1] < x \leq A[p..n-1]$
“derive” conditions from pictures
do we have termination?