

## Lecture 16: sorting

- using loop invariants to develop sorts

To develop a loop:

- write down an invariant  $P$

- initialization: (does it start right?)  
set variables so that  $P$  is true

- termination: (does it end right?)  
after the loop, if invariant is true &  
guard is false (i.e. loop terminates)  
is my postcond. true?

- progress: (does it go forward?)  
→ update vars so they approach term. cond.

- preservation: (is invariant always true?)  
→ loop body must reestablish invariant.