Princeton University
COS 217: Introduction to Programming Systems
Pointer-Related Operators

Key

p, p1, p2  Pointer variables
i    An integral expression

Operators Meaningful for Any Pointer Variable

Dereference Operator

*p  The contents of the memory referenced by p.

Equality and Inequality Relational Operators

p1 == p2  1 if p1 is equal to p2, and 0 otherwise.
p1 != p2  1 if p1 is unequal to p2, and 0 otherwise.

Assignment Operator


Operators Meaningful for Pointers that Reference Array Elements

Arithmetic Operators

p + i  The address of the ith element after the one referenced by p.
i + p  The address of the ith element after the one referenced by p.
p - i  The address of the ith element before the one referenced by p.
p++  Side effect: Increment p to point to the next element.
The previous value of p.
++p  Side effect: Increment p to point to the next element.
The new value of p.
p--  Side effect: Decrement p to point to the previous element.
The previous value of p.
--p  Side effect: Decrement p to point to the previous element.
The new value of p.

Arithmetic Operators

p1 - p2  The "span" of p1 and p2.

Relational Operators

p1 < p2  1 if p1 is less than p2, and 0 otherwise.
p1 <= p2  1 if p1 is less than or equal to p2, and 0 otherwise.
p1 > p2  1 if p1 is greater than p2, and 0 otherwise.
p1 >= p2  1 if p1 is greater than or equal to p2, and 0 otherwise.
Assignment Operators

\[ p += i \]  
Side effect: Increment \( p \) so its value is the address of the \( i \)th element after the one referenced by \( p \).
The new value of \( p \).

\[ p -= i \]  
Side effect: Decrement \( p \) so its value is the address of the \( i \)th element before the one referenced by \( p \).
The new value of \( p \).

Disallowed

\[ p1 + p2 \]
\[ i - p \]
\[ i += p \]
\[ i -= p \]
\[ p == i \]

Array Subscripting Operator

\[ p[i] \]  
\( *(p + i) \), that is, the contents of memory at the address that is \( i \) elements after the address referenced by \( p \).