

operator+ and operator- for iterators

This is a recommendation to add operator+ to forward iterator and operator- to bidirectional iterator in clause 24. For detailed discussion see paper WG21/N0702 X3J16/95-0102, issue 12.

WP Changes

Update Table 59 in lib.forward.iterators to include the row describing $r += n$, the row describing $a + n$ and $n + a$, and the row describing $a [n]$ from Table 61-Random access iterator as follows:

$r += n$	X&	{ Distance $m = n$; while ($m-- > 0$) $++r$; return r ; }	note: realizable in linear time. pre: $n \geq 0$.
$a + n$	X	{ X $tmp = a$; return $tmp += n$; }	note: realizable in linear time. pre: $n \geq 0$.
$n + a$			$a + n == n + a$.
$a [n]$	Convertible to T	$*(a + n)$	note: realizable in linear time.

Update Table 60 in lib.bidirectional.iterators to include the rows describing $r += n$, $r -= n$ and the row describing $a - n$ from Table 61-Random access iterator as follows:

$r += n$	X&	{ Distance $m = n$; if ($m \geq 0$) while ($m--$) $++r$; else while ($m++$) $--r$; return r ; }	note: realizable in linear time.
$r -= n$	X&	return $r += -n$;	note: realizable in linear time.
$a - n$	X	{ X $tmp = a$; return $tmp -= n$;	note: realizable in linear time.

Update Table 61 in `lib.random.access.iterators` to remove the first four rows (`r += n` to `a - n`) and the row containing `a [n]`.

Update 24.1-8

“All the categories of iterators require only those functions that are realizable for a given category in constant time (amortized), except addition operators for forward iterator and addition and subtraction operators for bidirectional iterator. These are realized in linear time. Therefore requirement tables for the iterators do not have a complexity column.”

Update 24.2.6

Change the first paragraph to “The library provides two template functions `advance` and `distance`. These functions use `+` and `-` for random access iterators (and are, therefore, constant time for them); for input and forward iterators they use `++`, and for bidirectional iterators they use `++` and `--` to provide linear time implementations.”