

Programowanie C++

Wykład 2 (06.03.2017)

Liczby całkowite

0	0	0	1	1	0	0	1
2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0

Wartość?

Zakres?

Ujemne liczby całkowite

0	0	0	1	1	0	0	1
-2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0

Dłuższe liczby całkowite

Little endian

0	0	0	0	0	1	0	0
2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^9	2^8

0	0	0	0	0	0	1	1
2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0

a może tak:

Big endian

0	0	0	0	0	1	0	0
2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0

0	0	0	0	0	0	1	1
2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^9	2^8

Typy liczb całkowitych

- Pascal:
 - int64(64), integer(32), smallint(16), shortint(8)
 - qword(64), longword(32), word(16), byte(8)
- SQL: bigint(64), int(32), smallint(16), tinyint(8)

Typy całkowite w C++

Character types	char	Exactly one byte in size. At least 8 bits.
	char16_t	Not smaller than char. At least 16 bits.
	char32_t	Not smaller than char16_t. At least 32 bits.
	wchar_t	Can represent the largest supported character set.
Integer types (signed)	signed char	Same size as char. At least 8 bits.
	<i>signed short int</i>	Not smaller than char. At least 16 bits.
	<i>signed int</i>	Not smaller than short. At least 16 bits.
	<i>signed long int</i>	Not smaller than int. At least 32 bits.
	<i>signed long long int</i>	Not smaller than long. At least 64 bits.
Integer types (unsigned)	unsigned char	(same size as their signed counterparts)
	unsigned short int	
	unsigned int	
	unsigned long int	
	unsigned long long int	

W praktyce można założyć:

- char 0 127
- short -32k 32k
- unsigned short 0 65k
- int -2.1G 2.1G
- unsigned int 0 4.3G
- Long long -9.2x10¹⁸ 9.2x10¹⁸

Operacje bitowe a logiczne

- Typ bool
- Operatory bitowe: `&`, `|`, `^`, `~`
- Operatory logiczne: `&&`, `||`

Sposoby zapisu liczb w kodzie

```
int a = 100;
```

```
int b = 0100;
```

```
int c = 0x100;
```

```
int d = 100LL;
```