

Data Types in Solidity Smart Contract

Part 21 - Contract Types, Fixed-size Byte Arrays,
Dynamically-sized Byte Arrays, Address Literals,
Rational and Integer Literals

Contract Types

"Every contract defines its own type"

- Elements of OOPL/OOP
- Convertible to inherited type of contract
- Convertible to/from address payable
 - `receive` or payable fallback function, `address(x)`
 - none of the two, `payable(address(x))`
- contract data representation = address data representation
 - Needed for ABI support

No operators are supported

Fixed-size Byte Arrays

Keywords: `bytes`, `bytesN`

- Sequence of N bytes, $N = [1, 32]$

Available operators: comparisons, bit and shift operators, index access

Only one type member

- `.length`

Dynamically-sized Byte Arrays

Two subtypes: bytes and strings

Keywords: bytes, string

Bytes

- Dynamically-sized byte array

String

- Dynamically-sized UTF-8-encoded string

Address Literals

Hexadecimal literals

- Must pass the address checksum test

The checksum address format is defined in EIP-55

Rational and Integer Literals

Integer literals

- Sequence of digits from a range 0-9
- Digits associated with weights, based on the digit position

Rational (decimal fractional) literals

- A dot (or comma, depending on the locale)
- Sequence of digits from a range 0-9 on either side
- Support for scientific notation: $MeE = M * 10^{**E}$
- Visual digit separation by underscore symbol