

# Rust cheatlist

## Cargo

- `cargo new project_name`: Initializes a new Rust project named *project\_name* in the current directory.
- `cargo build`: Build program without optimizations. Output is stored in `./target/debug`.
- `cargo build --release`: Build program with runtime optimizations. Output is stored in `./target/release`.

## Data types

- Scalar types:
  - Integer: Internally represented in 2-components notation when signed ( $-(2^n) \rightarrow 2^n - 1$ )

Length	Signed	Unsigned
8-bit	i8	u8
16-bit	i16	u16
32-bit	i32	u32
64-bit	i64	u64
128-bit	i128	u128
arch	isize	usize

- Floating point: `f32`, `f64`
- Boolean: `bool`
- Character: `char`
- Compound types
- Tuple: Fixed size (defined at declaration), elements may differ in type
  - `let tup: (i32, f64, u8) = (500, 6.4, 1);`
  - Values can be retrieved by either pattern matching: `let (x, y, z) = tup; x, y and z are now accessible as variables or by using a period let x = tup.0;` \* Array: Fixed size, elements should be of the same type \* `let a = [1, 2, 3];` \* `let a: [f64; 3] = [1.0, 2.0, 3.0];` \* `let a = [0; 5];` :: Creates an array of size 5 with all elements initialized to 0 \* `let first = a[0];` :: Accessing elements of array \* for element in `a.iter()` { ... } : Iterates over elements in array \* Rust panics on index out of bounds situations ===== Variables ===== \* `let foo = bar;` :: Creates immutable variable `foo` and assigns it value `bar`. \* `let mut foo = bar;` :: Creates mutable variable `foo` and assigns it value `bar`. \* `let foo: type = false;` :: Creates immutable variable `foo` with explicit type definition. ===== Functions ===== \* `fn function_name() { ... }` \* `fn function_name(x: i32, y: char) { ... }` : Parameterized function \* `fn function_name(x: i32) -> i32 { ... }` : Function with return value. Returned value is last evaluated expression of the function body. ===== Terminology ===== \* Associated function: function implemented on a type rather than on a particular instance of the type. Similar as a static method in

*Java. \* Destructing: splitting a tuple in individual parts by pattern matching \* Expression: instructions that evaluate to a resulting value. No semicolon at end of line! \* Macro: \* Prelude: \* Statement: instructions that do not return a value \* Trait: ===== Syntax ===== \* &var: Passes var as a reference. Allows a function to access a variable without the need to copy it to the function's stack. \* &mut var: Passes var'' as a mutable reference. Allows a function to access and alter the variable's value.*

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