Introduction to Functions

This lesson introduces you to an important concept, functions.

We'll cover the following

What Is a Function?

A function is a block of code that can be reused. It is used to perform some specific tasks.

- ### `main` Function

  The simplest possible function that we have studied so far is the `main` function that is declared with `fn` keyword. This is where the program execution starts.

  However, it is possible to define a user-defined function.

- ### User-defined Functions

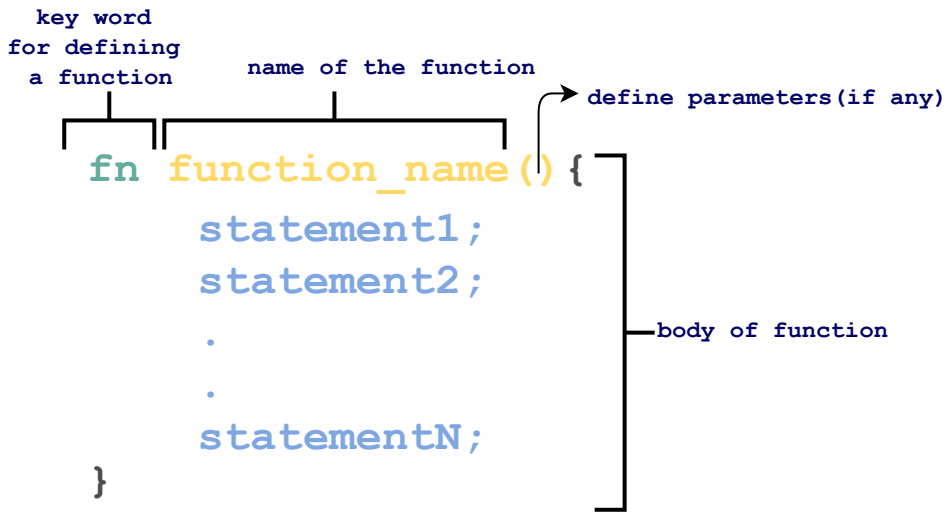
  The functions that are **customized** and are written by the programmer to perform the specified tasks.

Define a Function

A function is declared with the `fn` keyword.

Syntax

The general syntax is :



Defining a Function

> **Naming Convention:** The convention for writing a function name is in a snake case, i.e.,
>
> - All letters should be lower case
> - All words should be separated by underscores

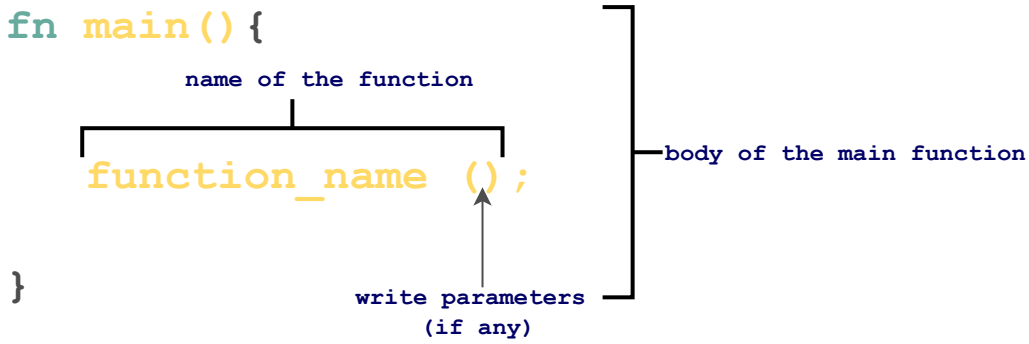
Call a Function

The function executes when it is invoked.

Syntax

The expression starts with the function name followed by the round brackets and then the semicolon. The function parameters may be added between the parentheses if needed.

The general syntax for invoking a function:



Invoke a Function

> **Note:** A user-defined function can be invoked from another function or the `main` function. It can be defined anywhere, above or below the `main` function.

> If a function is invoked but its definition does not exist, the compiler will throw a compilation error, ✕, such as error[E0425]: cannot find function function_xyz in this scope.

Example

The following example makes a user-defined function and invokes it from within the `main` function.

```
//define a function
fn display_message(){
  println!("Hi, this is my user defined function");
}
//driver function
fn main() {
     //invoke a function
      display_message();
      println!("Function ended");
}
```

Explanation

The above program comprises two functions, the user-defined function `display_message()` and the driver function `main()` where the function is being

called.

User defined function

The function `display_message()` is defined from **line 2 to line 4**. On *line 3* a message is printed.

Driver function

The driver function `main()` is defined from **line 6 to line 10**. On *line 8* the function `display_message()` is invoked.

The following illustration shows how program execution proceeds in the above code:

```
fn display_message(){
  println!("Hi, this is my user defined function");
}
fn main() {
      display_message();
      println!("Function ended");
}
```

execution starts with the call to the main function

Output:


```
fn display_message(){
  println!("Hi, this is my user defined function");
}
fn main() {
      display_message();
      println!("Function ended");
}
```

function is invoked

Output:

```
fn display_message(){
  println!("Hi, this is my user defined function");
}
fn main() {
      display_message();
      println!("Function ended");
}
```

Output:


```
fn display_message(){
  println!("Hi, this is my user defined function");
}
fn main() {
      display_message();
      println!("Function ended");
}
```

Output: Hi,I have entered a user defined function


```
fn display_message(){
  println!("Hi, this is my user defined function");
}
fn main() {
      display_message();
      println!("Function ended");
}
```

Output: Hi,I have entered a user defined function

```
fn display_message(){
  println!("Hi, this is my user defined function");
}
fn main() {
      display_message();
      println!("Function ended");
}
```

```
Output: Hi,I have entered a user defined function
        Function ended
```



```
fn display_message(){
  println!("Hi, this is my user defined function");
}
fn main() {
      display_message();
      println!("Function ended");
}end of program code
```

```
Output: Hi,I have entered a user defined function
        Function ended
```


Quiz

Test your understanding of basics of functions in Rust!

Quick quiz on basics of Functions!

What is the output of the following program?

```
fn display_message(){
    println!("Hi this is my user defined function");
}
fn main() {
    display_message();
    println!("function is called");
}
```

Retake Quiz

Now that you have learned the basics, let's learn to pass parameters to the function.