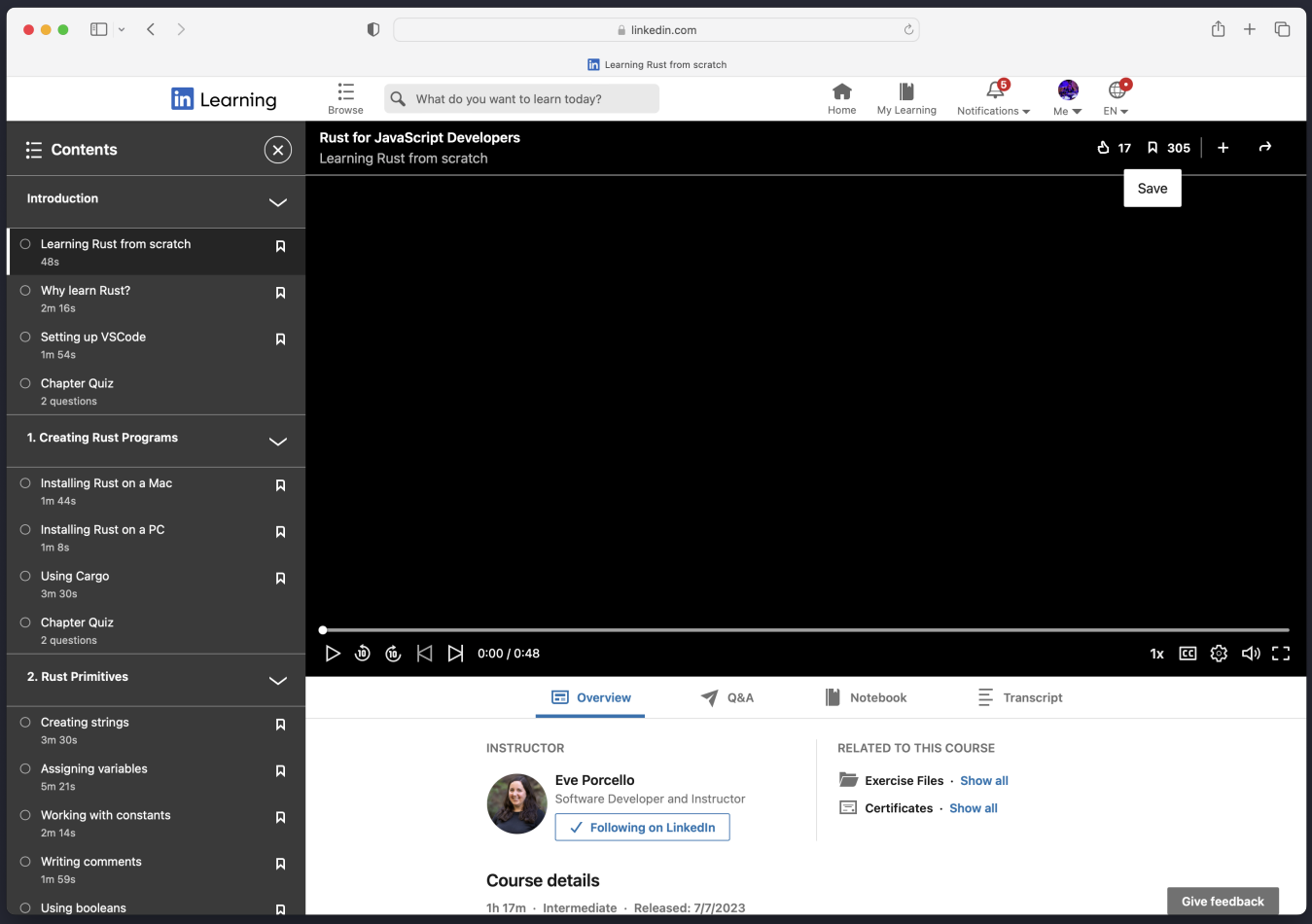
2023.08.26 LinkedIn Course – Eve Porcello – Rust for JavaScript Developers (~1 hr 17 mins)

Saturday, August 26th, 2023, 8:04am

Originally released on Friday, July 7th, 2023 and available on LinkedIn at *https://www.linkedin.com/learning/rust-for-javascript-developers/learning-rust-from-scratch*



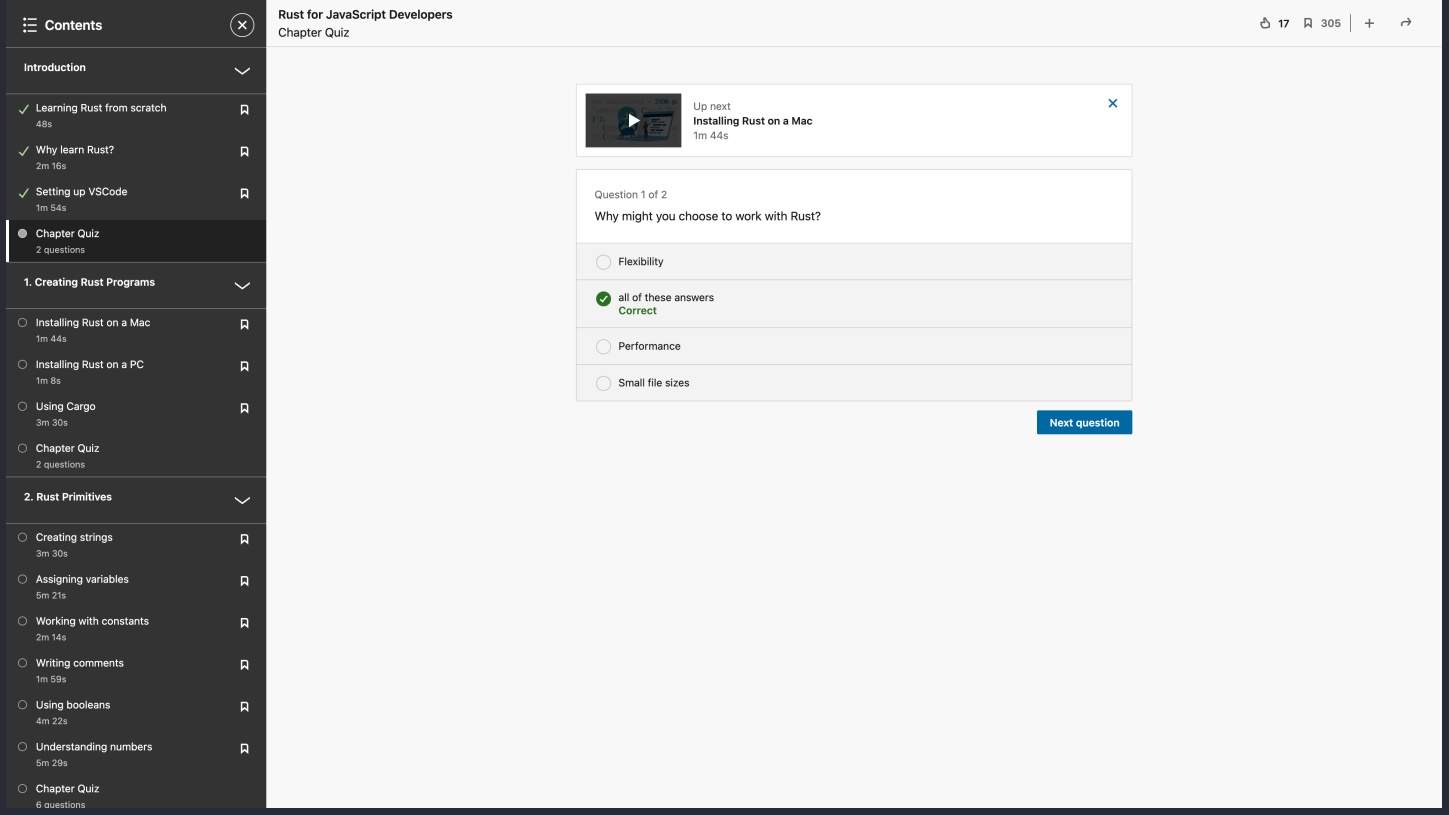
Introduction

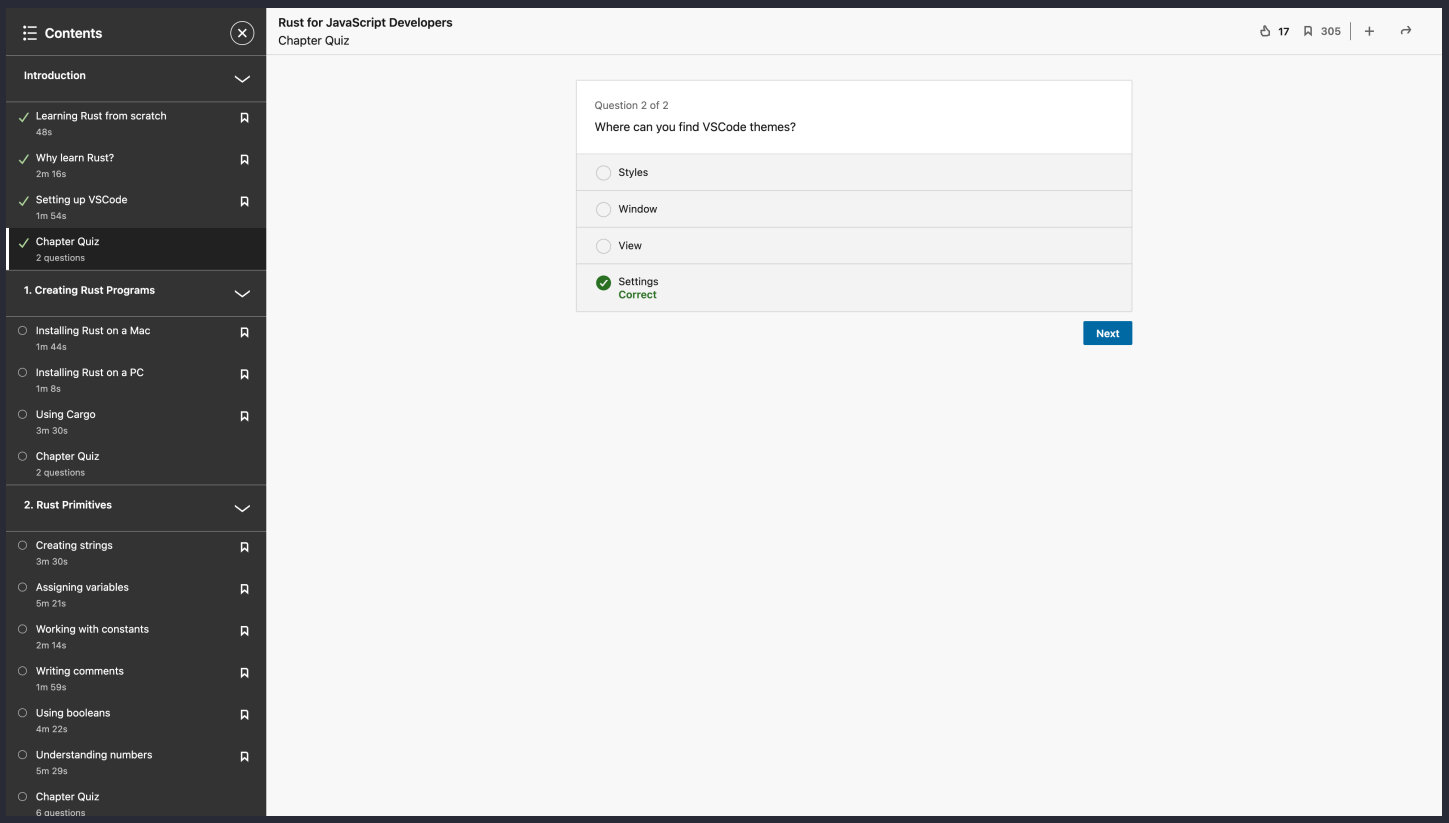
Learning Rust from scratch

Why learn Rust?

Setting up VSCode

Chapter Quiz





Creating Rust Programs

Installing Rust on a Mac

Install Rust globally on your machine:

```
% curl --proto '=https' --tlsv1.2 -sSf https://sh.rustup.rs | sh
% source "$HOME/.cargo/env"
```

Verify Rust has been installed successfully:

```
% rustc --version
rustc 1.72.0 (5680fa18f 2023-08-23)
```

Installing Rust on a PC

Using Cargo

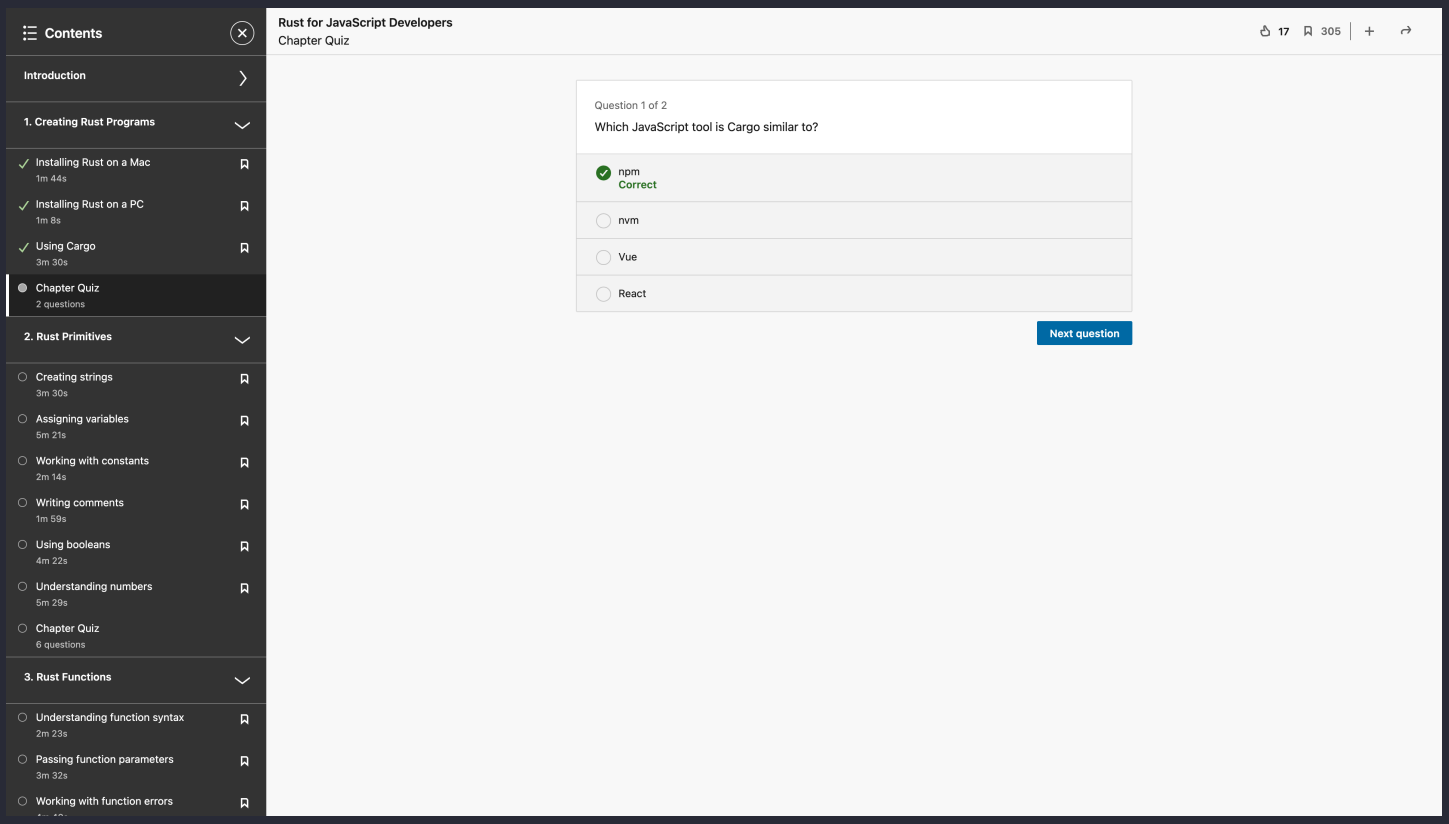
Think of `cargo` as somewhat comparable to `npm` in JavaScript land.

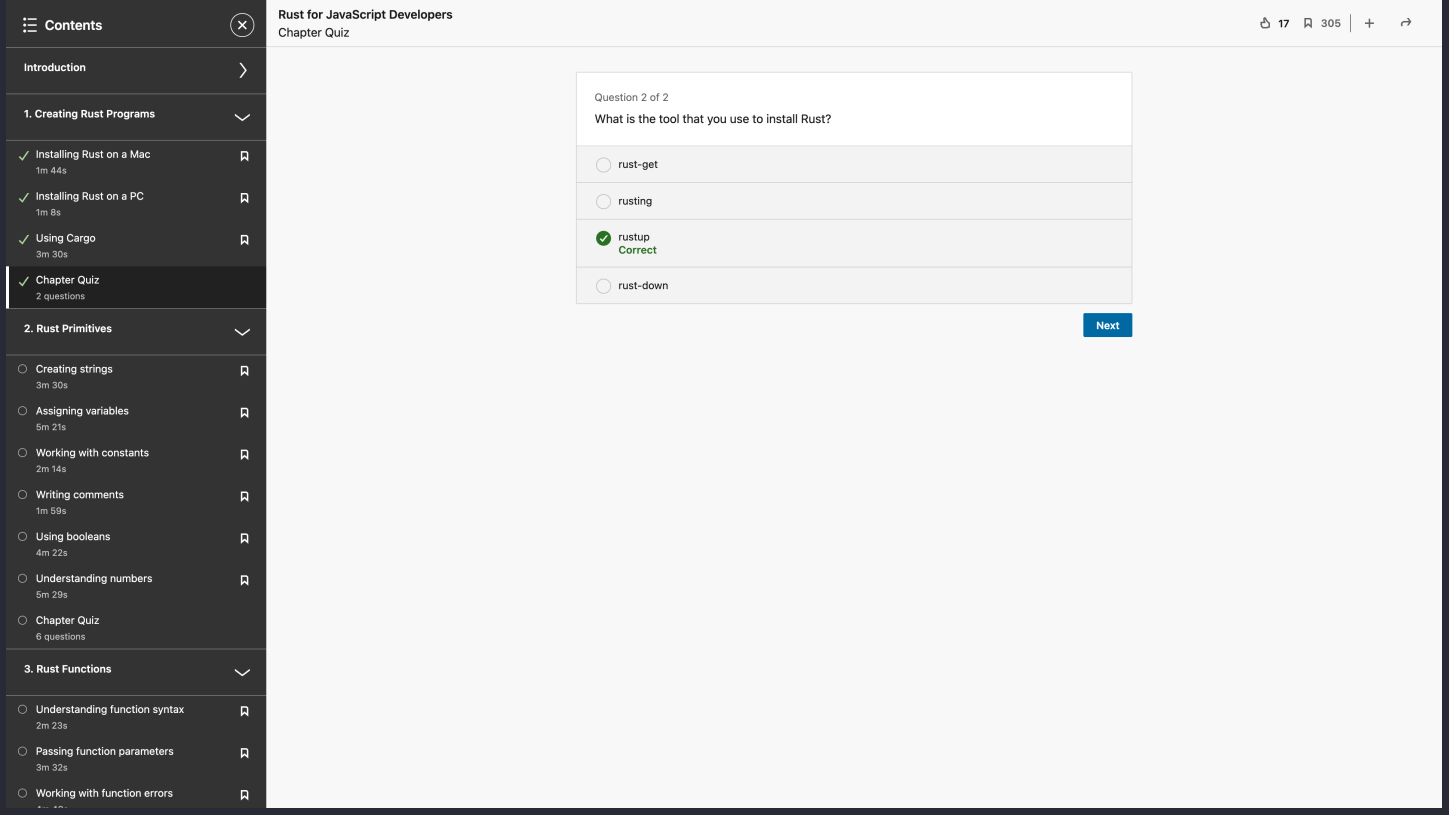
```
# Create a new Rust application using cargo
% cargo new camping-app

# Navigate to the source file directory for our app
% cd camping-app/src

# Note that we have a main.rs file.
## Compile it using rustc - the Rust compiler
% rustc main.rs
## Run the binary
% ./main
Hello, world!
```

Chapter Quiz





Rust Primitives

Creating strings

```
fn main() {
    println!("Hello, world!");
    println!("Hey it's all happening!");
}
```

Assigning variables

```
fn main() {
    let mut destination = "Crater Lake";
    println!("{} is the deepest lake in the US", destination);
    destination = "Sparks Lake";
    println!("{} is also a lake in the US", destination);
}
```

If you want to have a multi-word variable name in Rust, use snake case:

```
fn main() {
        let mut destination_lake = "Crater Lake"
}
```

Working with constants

Note that Rust will warn us to use capitalized names for constants and to make sure we have a type defined for our constant value:

```
fn main() {
    const DESTINATION: &str = "Crater Lake";
    println!("{}", DESTINATION);
}
```

Writing comments

```
/*
In this file, we set a destination!
 */

/// This function is used throughout the entire project to state where the destination is.
fn main() {
    const DESTINATION: &str = "Crater Lake";
    println!("{}", DESTINATION);
}
```

Generate documentation based on your comments

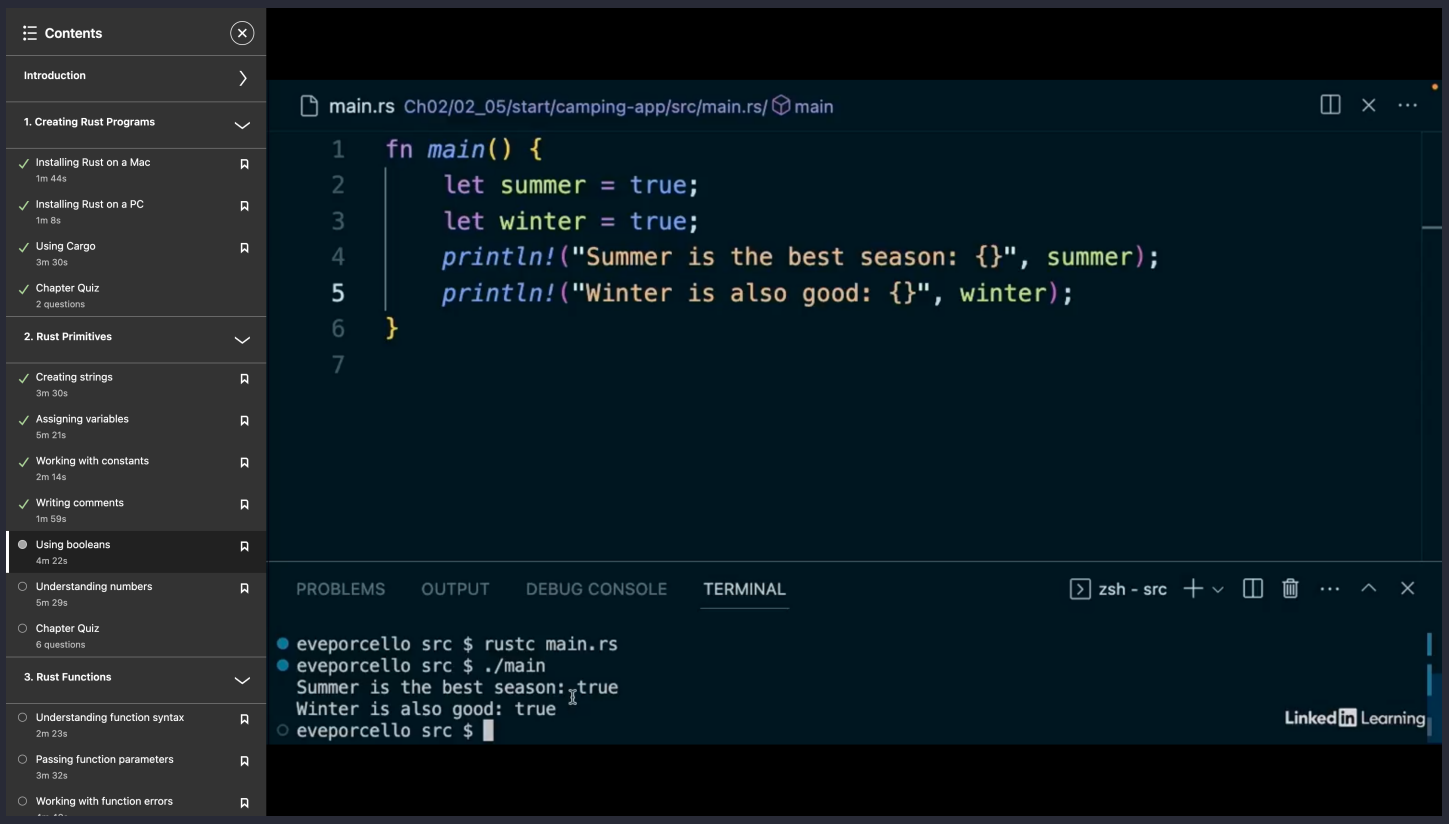
We can use `cargo doc` to generate documentation for our application based on our comments.

```
% cargo doc
 Documenting camping-app v0.1.0 (/Users/rob/repos/linkedin-course-rust-for-javascript-developers-eve-porcello/Exercise
Files/Ch02/02_04/finished/camping-app)
    Finished dev [unoptimized + debuginfo] target(s) in 0.69s
```

We can see the generated HTML documentation underneath the `target` directory of our Rust application – e.g., `Exercise Files/Ch02/02_04/finished/camping-app/target/doc/camping_app/index.html`.

Using booleans

Notice that we didn't add a type annotation here. Rust will infer the variable as a boolean if it is assigned `true` or `false`.

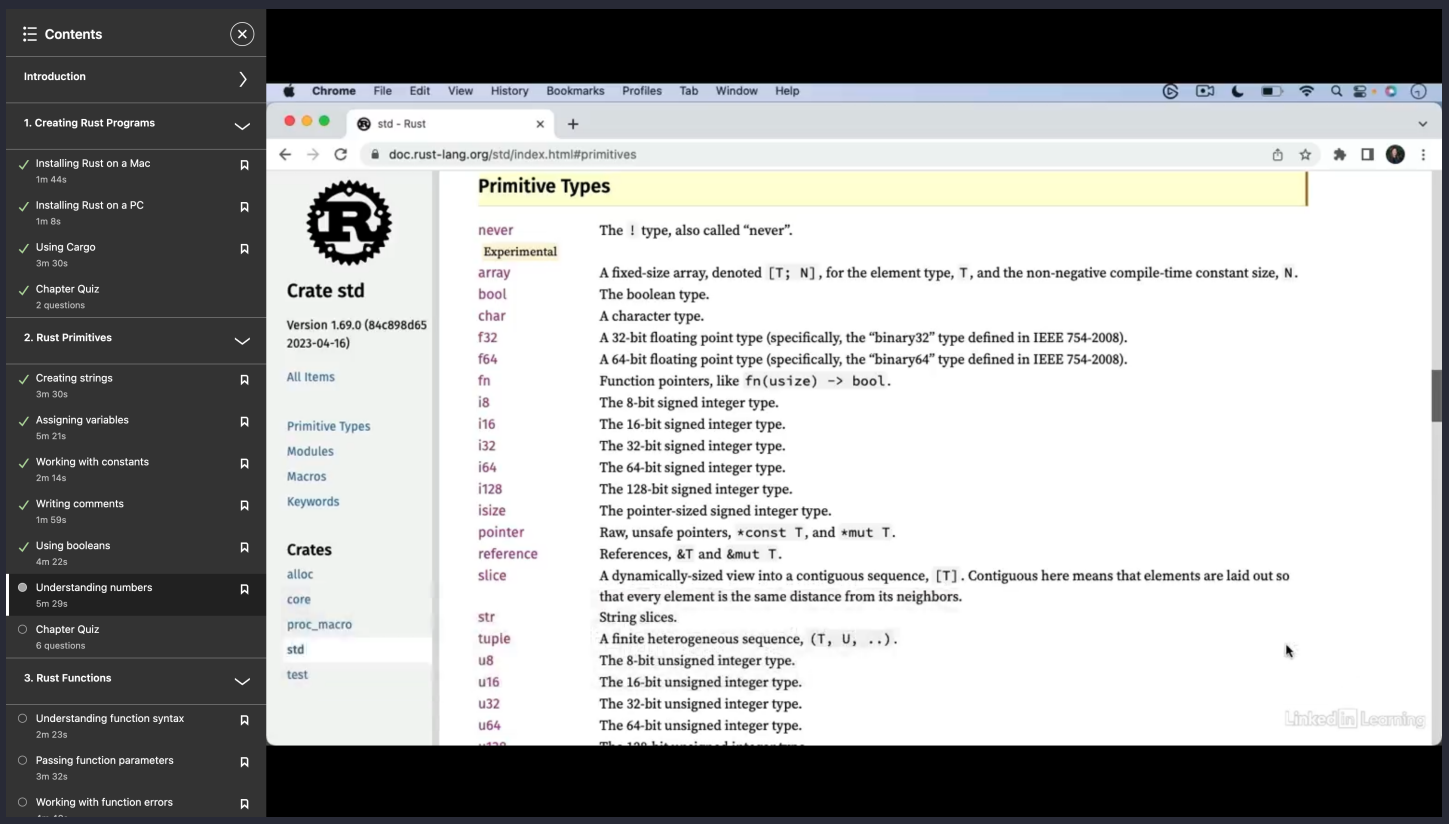



```
fn main() {
    let summer: bool = false;
    let winter: bool = false;

    if summer {
        println!("go biking!");
    } else if winter {
        println!("go skiing");
    } else {
        println!("do something else");
```

```
    }
}
```

Understanding numbers




```
fn main() {
        # A 64-bit unsigned integer
    let days: u64 = 5;
    println!("{} days", days);

        # A 32-bit floating point number
    let backpack_weight: f32 = 28.5;
    println!(
        "hiking for {} days with a {} lb. pack",
        days, backpack_weight
    );

    let meals = days * 3;
    println!("{} meals", meals);
}
```

Chapter Quiz

Question 1 of 6

What is the type annotation for a boolean?

- b
- true/false
- bool
  Correct
- boolean

Next question

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Question 2 of 6

How do you create documentation comments in Rust?

- ???
- /?
- ///
  Correct
- /*

Next question

Question 3 of 6

How can you tell the difference between a constant and a regular variable in Rust?

- Using camel case
- ALL CAPS
  Correct
- Believing strongly enough that it will remain constant
- all lowercase

Next question

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Question 4 of 6

How do you make a variable mutable?

- Add the function keyword.
- Convert to a string.
- Add the mut keyword.
  Correct
- You cannot make a variable mutable in Rust.

Next question

Question 5 of 6

Which character do you use to denote a string?

- Backticks
- Double quotes
  Correct
- Exclamation marks
- Single quotes

Next question

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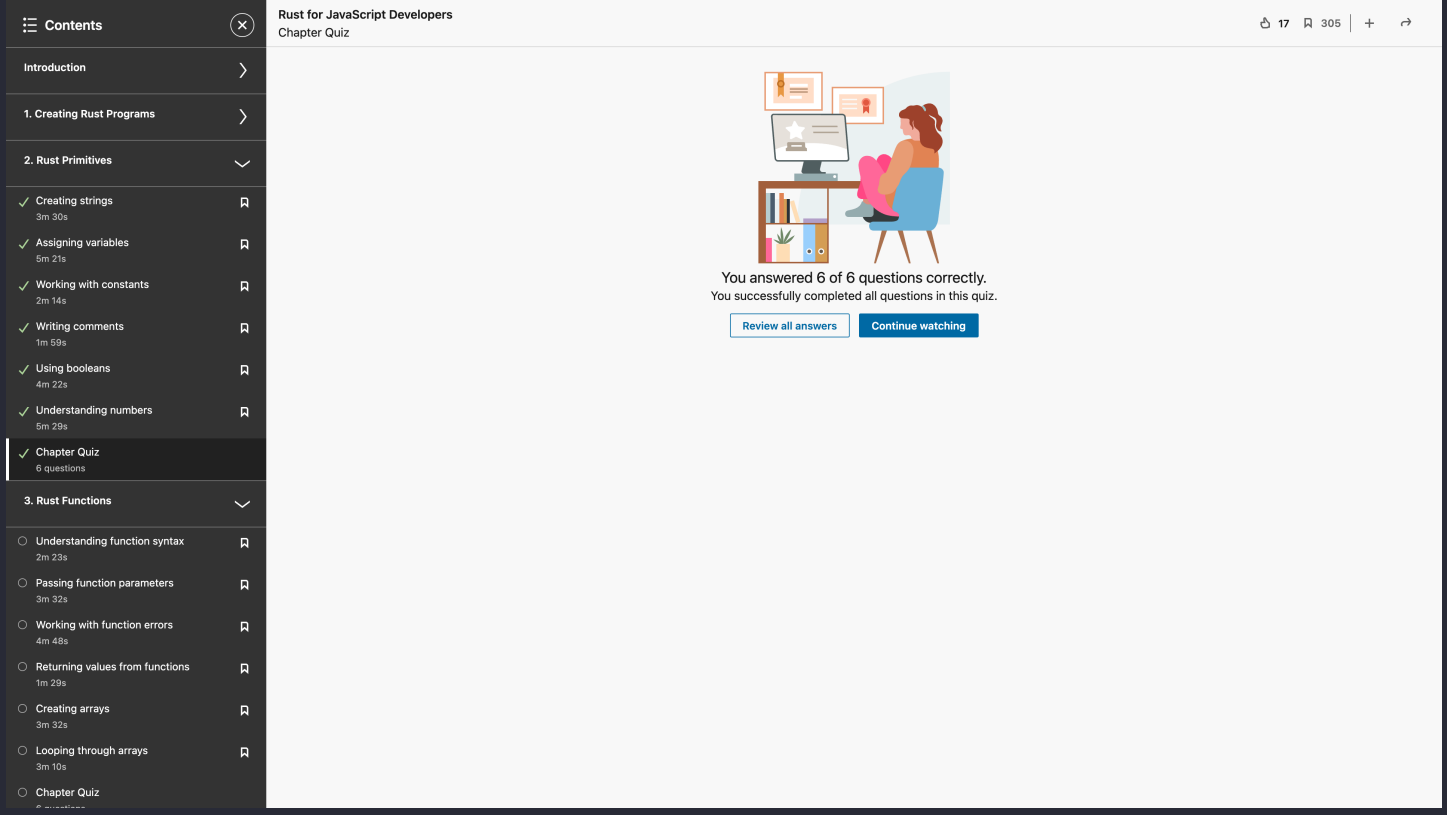
Question 6 of 6

What does a u stand for when annotating a value's type?

- unsupported
- underlined
- unbelievable
- unsigned
  Correct

Next



Rust Functions

Understanding function syntax

```rust
fn calculate_distance() {
    let days: u64 = 5;
    println!("{} days", days);
    let distance: u64 = 10;
    println!("{} miles total distance", distance * days);
}

fn main() {
    calculate_distance();
}
```

Passing function parameters

```rust
fn calculate_distance(days: u64, distance: u64) -> u64 {
    let total_miles = days * distance;
    return total_miles;
}

fn main() {
    let result = calculate_distance(5, 10);
    println!("{} miles", result);
}
```

Working with function errors

```rust
# We are returning a result that will either be an unsigned 64-bit integer or a string in the event of an error or unexpected data
fn calculate_distance(days: u64, distance: u64) -> Result<u64, String> {
    if days == 0 {
        Err("Cannot go on a zero-day hike".to_string())
    } else {
        Ok(days * distance)
    }
}
```

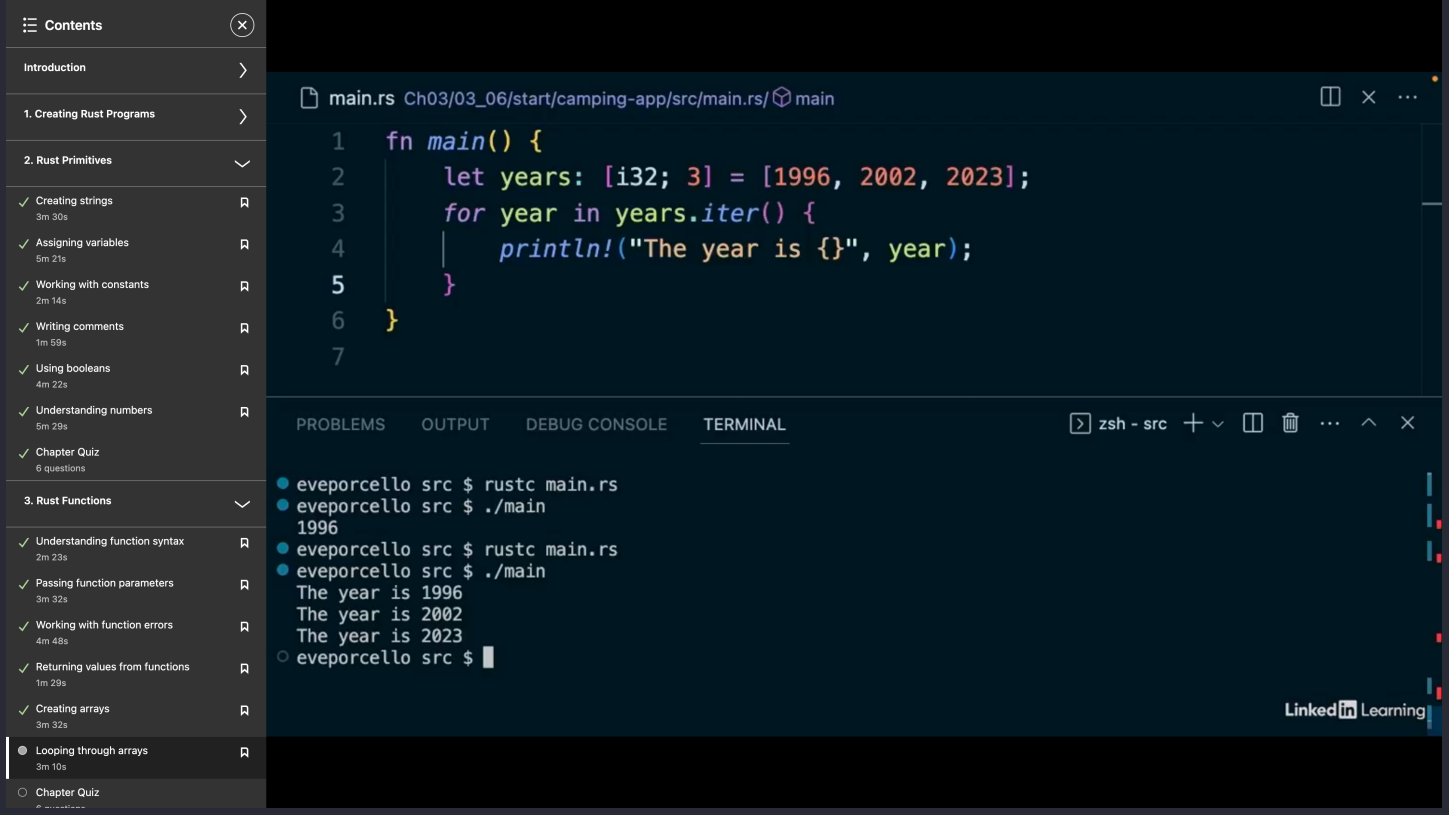
```
fn main() {
    let result = calculate_distance(0, 10);

        # Invoke the appropriate println! statement based on the result we receive
    match result {
        Ok(miles) => println!("Miles: {}", miles),
        Err(error) => println!("Error: {}", error),
    }
}
```

Returning values from functions

Creating arrays

```
fn main() {
    let years: [i32; 3] = [1996, 2002, 2023];
    println!("{}", years.len());
}
```

Looping through arrays



BONUS: Create a countdown using a while loop

```rust
fn main() {
    let mut new_year_countdown = 10;

    while new_year_countdown > 0 {
        println!("{new_year_countdown}");
        new_year_countdown -= 1;
    }
}
```

Chapter Quiz

Question 1 of 6

Where does an index start in Rust?

- 2
- 0 **Correct**
- 1
- -1

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Question 2 of 6

Arrays can hold:

- the same type **Correct**
- only numbers
- different types
- only strings

Next question

Question 3 of 6

What is a function that returns an error in Rust?

- `Error()`
- `Exception()`
- ✓ `Err()` Correct
- `E()`

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Question 4 of 6

When you see println! in a Rust application, it is a:

- cry for help
- function
- return
- ✓ macro Correct

Next question

Question 5 of 6

What does the -> mean in Rust?

- a lambda function
- defines the type of the return value
  Correct
- an inline function
- defines the parameters

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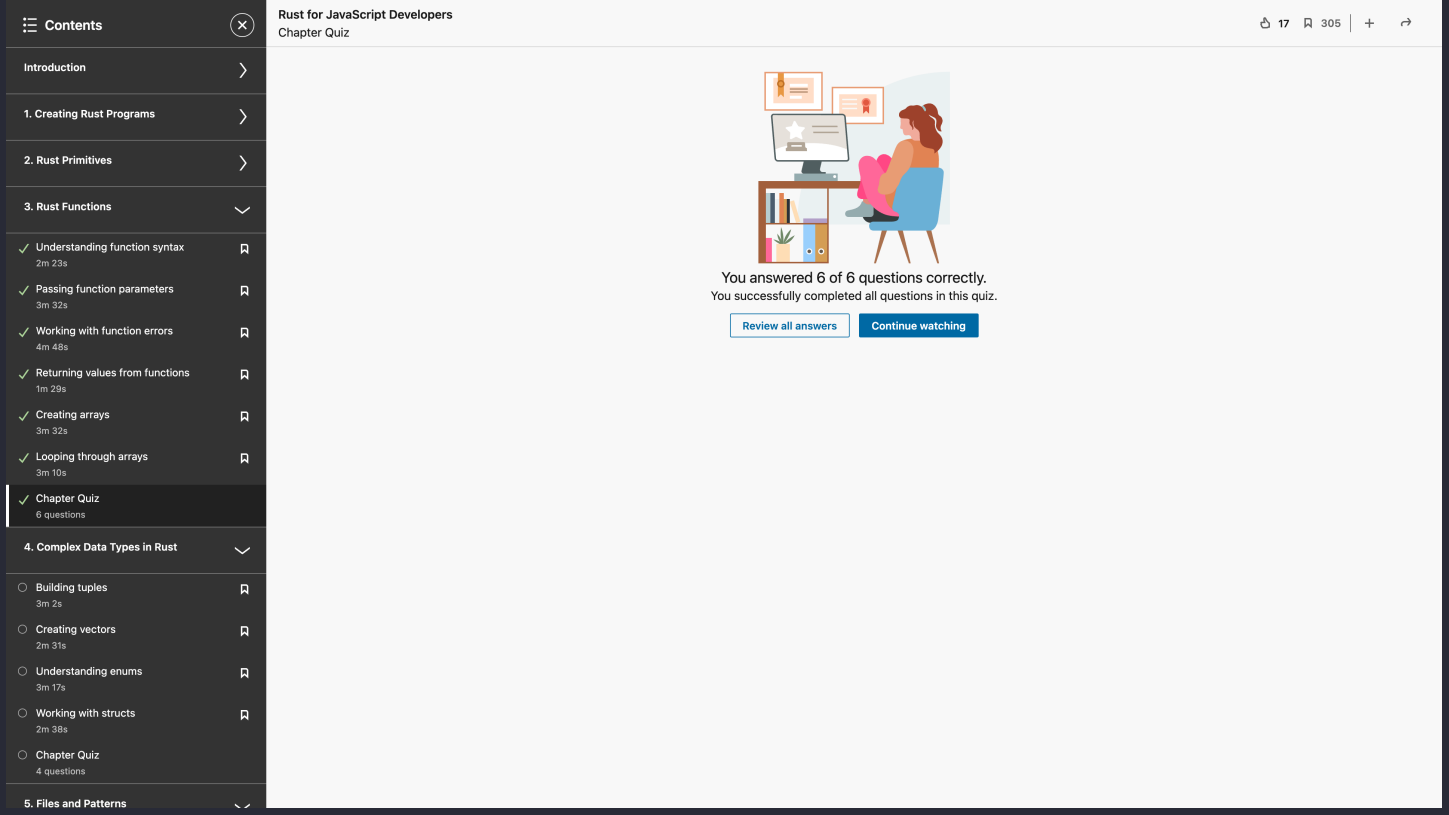
Question 6 of 6

How do you declare a function in Rust?

- fun keyword
- function keyword
- function! keyword
- fn keyword
  Correct

Next



Complex Data Types in Rust

Building tuples


```
fn sentence_builder(person_info: (&str, u64, &str)) {
    println!(
        "{} is {}, and her last initial is {}.",
        person_info.0, person_info.1, person_info.2
    );
}

fn main() {
    let values = ("Eve", 38, "P");
    sentence_builder(values);
}
```

Creating vectors

What are vectors? "Vecs" – or vectors – are dynamically sized lists.

If you're not excited about that constructor syntax, you can use the `vec!` macro instead:

```
fn main() {
    let packing_list = vec!["sunglasses", "sunscreen", "hat"];
    println!("{:?}", packing_list);
}
```

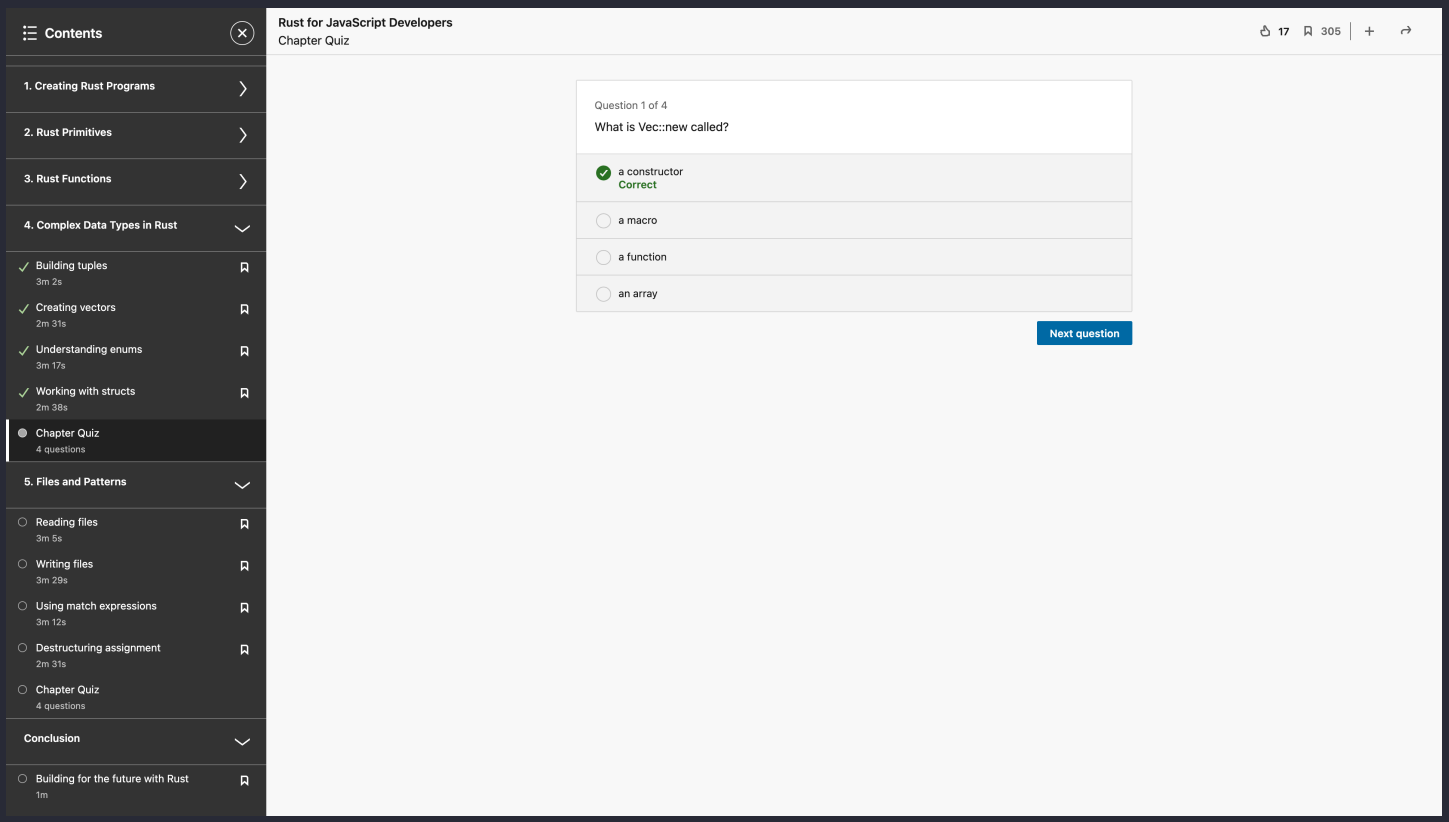
Understanding enums

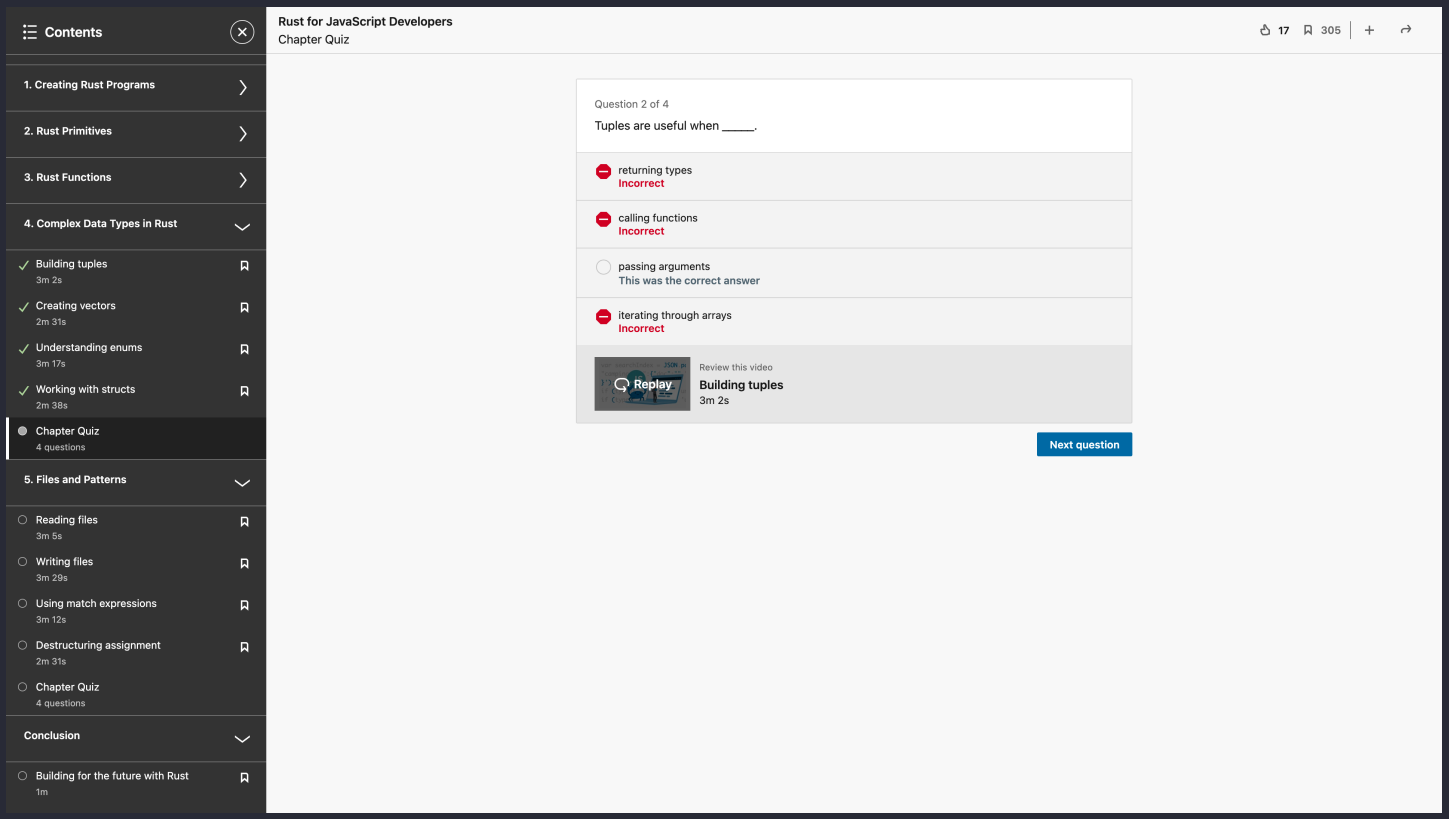
```
#[derive(Debug)]
enum Steepness {
    Easy,
    Moderate,
    Difficult,
}

fn main() {
    let _calm_trail = Steepness::Easy;
    let _fun_trail = Steepness::Moderate;
    let prickly_peak_trail = Steepness::Difficult;
    println!("Steepness is {:?}", prickly_peak_trail);
}
```

Working with structs

```
struct Hiker {
    name: String,
    miles_hiked: u64,
}

fn main() {
    let jennifer = Hiker {
        name: String::from("Jennifer"),
        miles_hiked: 49,
    };
    println!("{} has hiked {} miles", jennifer.name, jennifer.miles_hiked);
}
```

Chapter Quiz





Question 3 of 4

A struct in Rust is most similar to what in JavaScript?

- a Node package
- a number
- an object
  Correct
- an array

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Question 4 of 4

What are enums best for?

- setting types for an integer
- storing a fixed set of values
  Correct
- returning values from a function
- storing a collection of arrays

Next

You answered 3 of 4 questions correctly.
Keep practicing! Review your answers and retake the quiz.

Review all answers | Continue watching

Files and Patterns

Reading files

```
# Similar to imports in JavaScript land - we will import the filesystem module from the standard Rust library
use std::fs;

fn main() {
    let text = fs::read_to_string("my_file.txt").expect("Something went wrong reading the file");

    println!("What is in this file:\n{}", text);
}
```

Writing files

```
use std::fs::OpenOptions; /// We need OpenOptions so we can open a file
use std::io::Write; /// Let's add the ability to write to a file

fn main() {
    let mut file = OpenOptions::new()
        .append(true) /// Add to our file unless we want to overwrite the existing contents of the file
        .open("my_file.txt")
        .expect("Something went awry with the file");
    let text = " We're making it happen!";
    file.write_all(text.as_bytes())
        .expect("something went wrong");
}
```

Using match expressions

```
fn main() {
    let destination = "Snow Lake";

    match destination {
        "Long Lake" => println!("We're heading to Long Lake!"),
        "Mammoth Lakes" => println!("We're heading to Mammoth!"),
        "Bowman Lake" => println!("We're heading to Bowman Lake!"),
        _ => println!("We're heading anywhere else"),
```

```
    }
}
```

Destructuring assignment

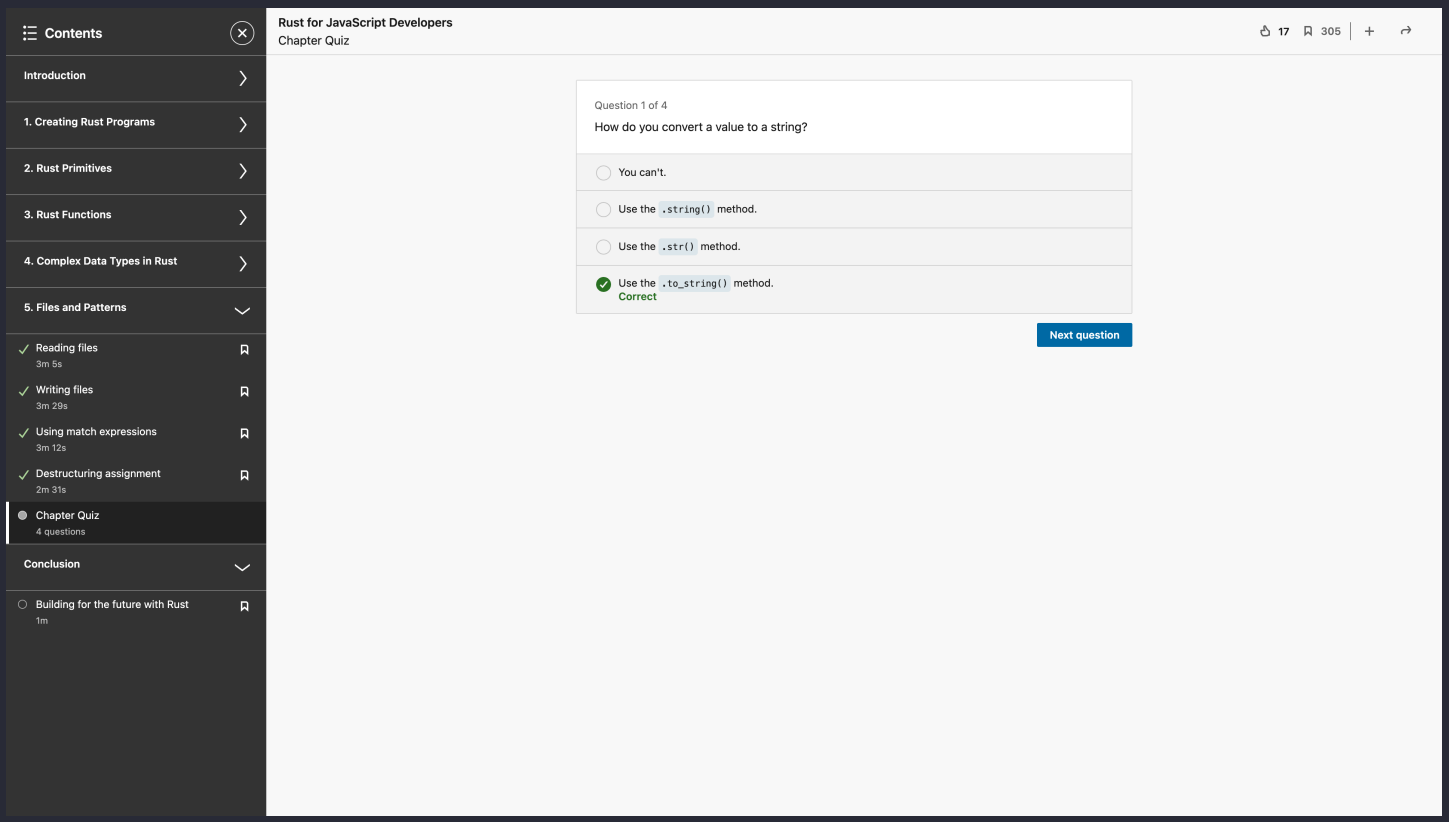
```
fn main() {
    struct Hiker {
        name: String,
        miles_hiked: u64,
    }

    let billy = Hiker {
        name: "Billy".to_string(),
        miles_hiked: 67,
    };

    let Hiker { name, miles_hiked } = billy;

    println!("name {}, miles: {}", name, miles_hiked);
}
```

Chapter Quiz



Question 2 of 4

How are arrow functions used in Rust?

- for fun
- for inline function returns
  Correct
- for profit
- for type setting

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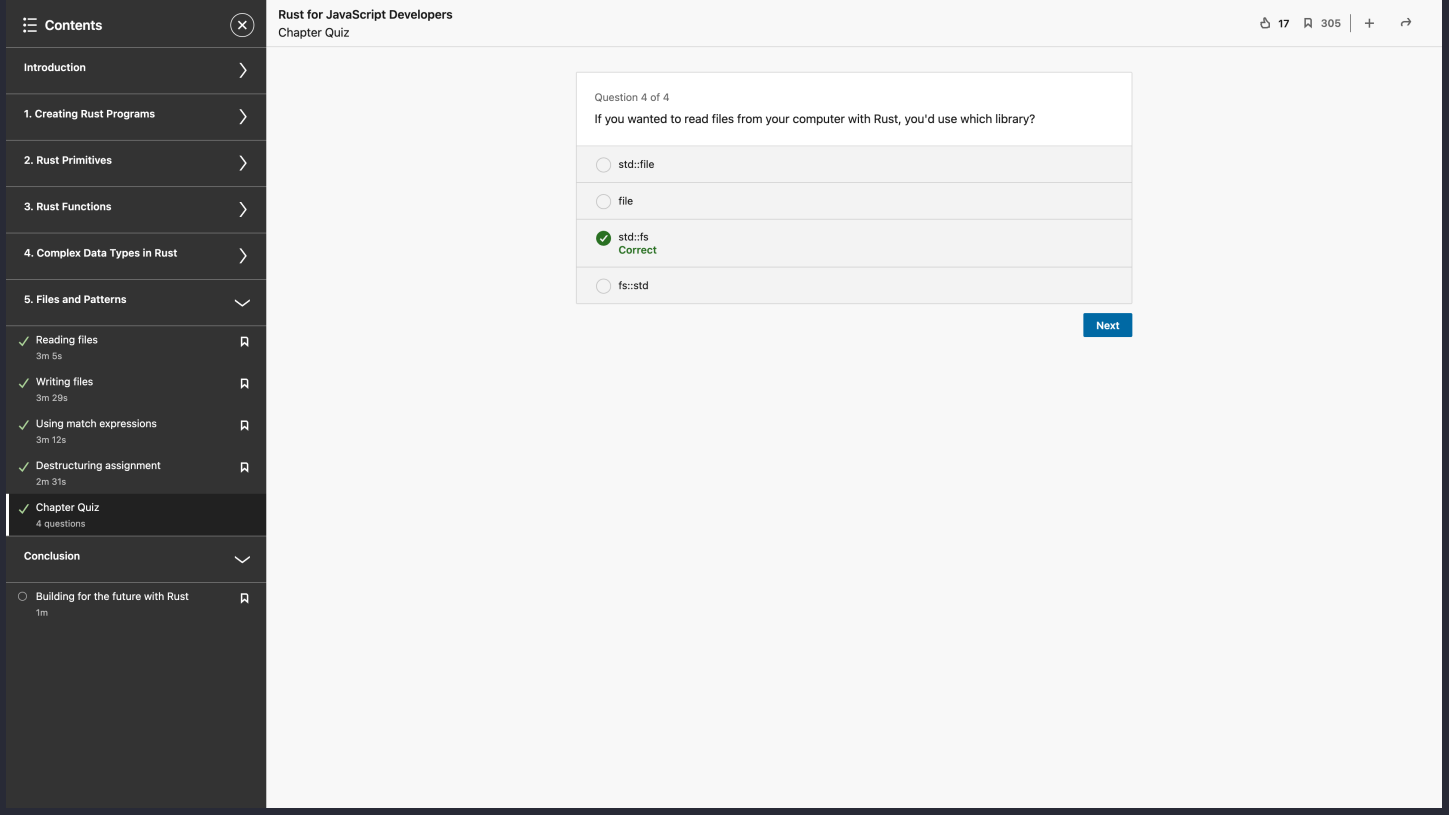
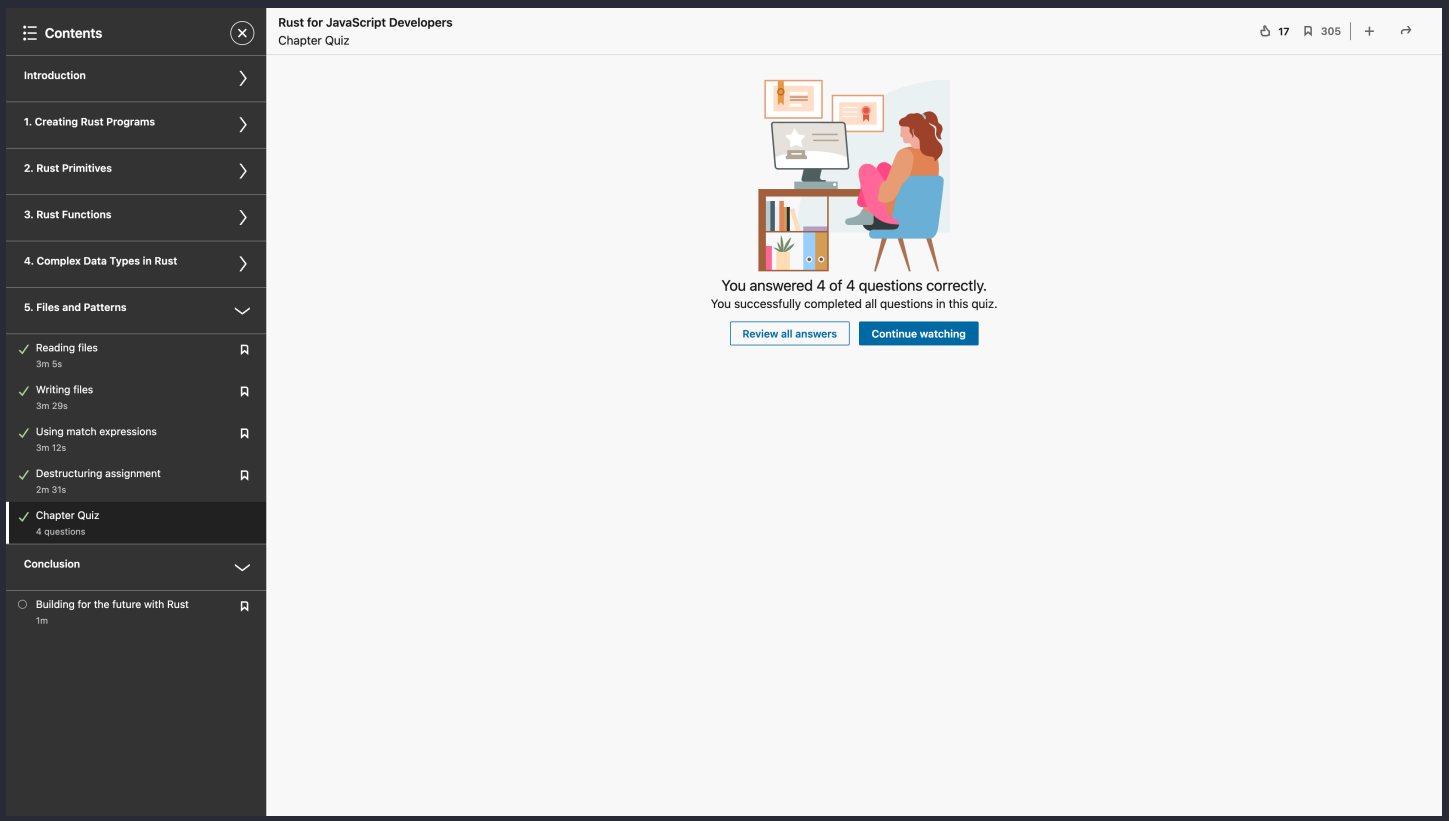
Question 3 of 4

When is the .expect() method called in Rust?

- when there is an error
  Correct
- when a file is deleted
- when you're out of memory
- when a file is opened

Next question





Conclusion

Building for the future with Rust

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- Rust Essential Training
- Advanced Rust: Managing Projects
- Rust Code Challenges

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RUN ··· DEBUG STABLE ··· SHARE TOOLS CONFIG

```
1 fn main() {
2     println!("thanks for taking the class!");
3 }
```

Execution Close

Standard Error

```
Compiling playground v0.0.1 (/playground)
 Finished dev [unoptimized + debuginfo] target(s) in 1.25s
  Running `target/debug/playground`
```

Standard Output

```
thanks for taking the class!
```