

Practice Exercises: Creating Variables and Assigning Data in R

Basic Variable Creation and Assignment

1. Assign Values

- Create a variable named `age` and assign it your age.
- Create a variable named `favorite_color` and assign it the name of your favorite color.
- Create a vector named `numbers` containing the numbers 1, 2, 3, 4, and 5.

2. Reassign Values

- Create a variable named `price` and assign it the value 200.
- Add 50 to the current value of `price` and update it.

Exploring Data Types

1. Create Variables of Different Data Types

- Create the following variables:
 - A numeric variable named `height` with value 170.5.
 - A character variable named `greeting` with value "Hello, World!".
 - A logical variable named `is_weekend` with value `FALSE`.
- Use the `class()` function to confirm the data type of each variable.

2. Coerce Data Types

- Create a variable `my_number` with the value 10.
- Convert `my_number` to a character and store it in `my_text`.
- Convert `my_text` back to numeric and store it in `my_new_number`.

Working with Variable Names

1. Valid and Invalid Variable Names

- Identify whether each of the following variable names is valid. If invalid, correct it and assign a value to it:
 - `2nd_score`
 - `total sales`
 - `score_1`
 - `average.value`
 - `my-score`

Operations on Variables

1. Perform Arithmetic

- Assign the value 25 to a variable `a` and 15 to a variable `b`.
- Create a variable `sum` that stores the sum of `a` and `b`.
- Create a variable `product` that stores the product of `a` and `b`.

2. Manipulate Strings

- Create a variable `first_name` with your first name.
- Create a variable `last_name` with your last name.
- Combine `first_name` and `last_name` into a single variable `full_name`.

Vectors and Assignment

1. Vector Assignment

- Create a vector `my_scores` with values 90, 85, 78, 92, 88.
- Add 5 to each value in `my_scores` and store the result in `updated_scores`.

2. Vector Indexing

- Use the `my_scores` vector you created above.
- Extract the first value from the vector and store it in `first_score`.
- Extract the last value and store it in `last_score`.

Exploring Built-In Functions

1. Summarize Data

- Create a vector `temperatures` with values 30, 32, 28, 25, 27.
- Use the following functions on `temperatures` and store the results in appropriately named variables:
 - `mean()`
 - `min()`
 - `max()`

2. Logical Variables

- Create a variable `current_temperature` and assign it the value 35.
- Create a logical variable `is_hot` that checks if `current_temperature` is greater than 30.

Challenge Questions

1. Data Types Challenge

- Create the following variables:
 - `score` with value 95.
 - `is_pass` as TRUE if `score > 50`, otherwise FALSE.
 - A vector `subjects` with values "Math", "Science", and "English".
- Check the data type of each variable using `class()`.

2. Combining Variables

- Assign your name to `my_name` and your age to `my_age`.
- Combine these into a sentence stored in the variable `info`:

```
"My name is [my_name] and I am [my_age] years old."
```

3. Advanced Challenge

- Create a vector `prices` with values 120, 150, 100, 180.
- Add 20% tax to each price and store the result in `prices_with_tax`.
- Calculate the total of `prices_with_tax` and store it in `total_price`.

Expected Outcome

Students will:

- Understand how to create, assign, and manipulate variables in R.
- Learn the rules for naming variables and practice consistency.
- Explore working with different data types and operations.
- Gain experience with vectors and built-in R functions.