

Lecture 2 Module 1: Arithmetic

Exercises

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Exercise 1.1: Weird Arithmetic

Consider this method for determining a number:

- We start with the value 17, then we multiply it by 11.
- We then raise the resulting quantity to the third power.
- We then add 1,653 to this value.

Determine if the final value is evenly divisible by 7.

Solution

```
# Type your solution here.
```

Exercise 2.2: Operator Precedence

I recently had to perform a calculation in which I took the three numbers -4, 2, and 10, squared them, multiplied these squared values by the weights 0.25, 0.25, and 0.50, and then added up the resulting values:

Value	Squared Value	Weight	Squared Value \times Weight
-4	16	0.25	4
2	4	0.25	1
10	100	0.50	50
Sum			55

I wrote this R code:

```
(-4^2 * 0.25) + (2^2 * 0.25) + (10^2 * 0.50)
```

```
## [1] 47
```

Why did I get the wrong answer with this expression?

Then write R code that will perform the calculation correctly.

Solution

Solutions to the Exercises

Exercise 1.1: Weird Arithmetic

Consider this method for determining a number:

- We start with the value 17, then we multiply it by 11.
- We then raise the resulting quantity to the third power.
- We then add 1,653 to this value.

Determine if the final value is evenly divisible by 7.

Solution

I will perform all the arithmetic operations to construct the final number, and then determine whether or not it is divisible by 7 by examining the remainder when using integer division with a divisor of 7.

```
( (17 * 11)^3 + 1653) %% 7
```

```
## [1] 0
```

Since the remainder is 0, we conclude that the final number is evenly divisible by 7. To check this, let's first calculate the final number:

```
(17 * 11)^3 + 1653
```

```
## [1] 6540856
```

Let's perform integer division on this value:

```
6540856 %/% 7
```

```
## [1] 934408
```

Now let's multiply this value by 7:

```
934408 * 7
```

```
## [1] 6540856
```

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Solution

```
((-4)^2 * 0.25) + (2^2 * 0.25) + (10^2 * 0.50)
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```
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