Workflow basics

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Coding basics

- R as a calculator

```
1 / 0
```

```
[1] Inf
```

```
sqrt(2)^2
```

```
[1] 2
```

```
sin(pi)
```

```
[1] 1.224606e-16
```

Coding basics

- R as a calculator
  - Calculus (Kaplan, 2022)

$$\frac{dx^3}{dx} = 3x^2$$

```
mosaicCalc::D(x^3 ~ x)
```

```
function (x)
3 * x^2
```

$$\int e^x dx = e^x + C$$

```
mosaicCalc::antiD(exp(x) ~ x)
```

```
function (x, C = 0)
exp(x) + C
```

Coding basics

- Creating and **c**ombining objects

```
primes <- c(2, 3, 5, 7, 11, 13)
primes + 2
```

```
[1]  4  5  7  9 13 15
```

Comments

- Use comments to explain the **why** of your code, not the how or the what
  - Don't describe every step in the comments

```
primes
```

```
[1]  2  3  5  7 11 13
```

```
# multiply primes by 3 to understand the concept of vectorization
primes * 3
```

```
[1]  6  9 15 21 33 39
```

What's in a name?

- Object names must start with a letter and can only contain letters, numbers, _, and .

```
1_primes <- c(2, 3, 5, 7, 11, 13)
```

```
Error: <text>:1:2: unexpected input
1: 1_
     ^
```

- Use **snake_case**

```
i_use_snake_case
otherPeopleUseCamelCase
some.people.use.periods
And_aFew.People_RENOUNCEconvention
```

What's in a name?

- R is strict and case sensitive

```r
my_variable <- 4
myvariable
```

```
Error in eval(expr, envir, enclos): object 'myvariable' not found
```

```r
My_variable
```

```
Error in eval(expr, envir, enclos): object 'My_variable' not found
```

Calling functions

- Function name, arguments and values

```
function_name(argument1 = value1, argument2 = value2, ...)
```

- An example with seq

```
seq(from = 2, to = 10, by = 2)
```

```
[1]  2  4  6  8 10
```

```
seq(by = 2, to = 10, from = 2)
```

```
[1]  2  4  6  8 10
```

```
# here we need to take into account the position of each argument
seq(2, 10, 2)
```

```
[1]  2  4  6  8 10
```

References I

Kaplan, D. (2022). *MOSAIC Calculus*. https://dtkaplan.github.io/MC2/