

# Introduction to R: Variables

Research Methods for Human Inquiry  
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This is a box.



Inside the box is a bunny.



The box is storage.  
It could store many things.  
It is a “**variable**”

The bunny is the thing stored  
The thing stored in a  
variable is its “**value**”

**Variable**

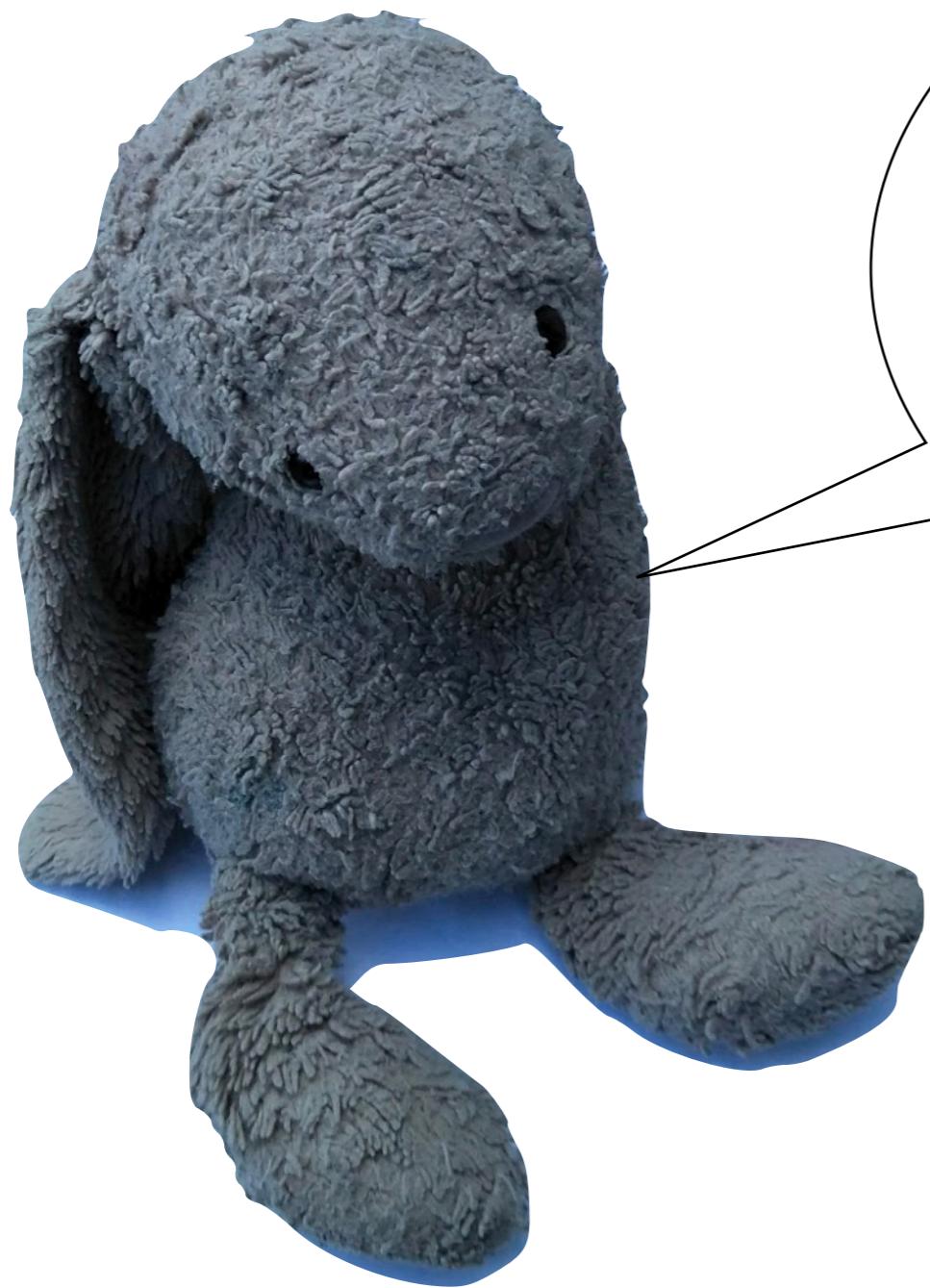


**Value**



```
animal <- "a bunny"
```

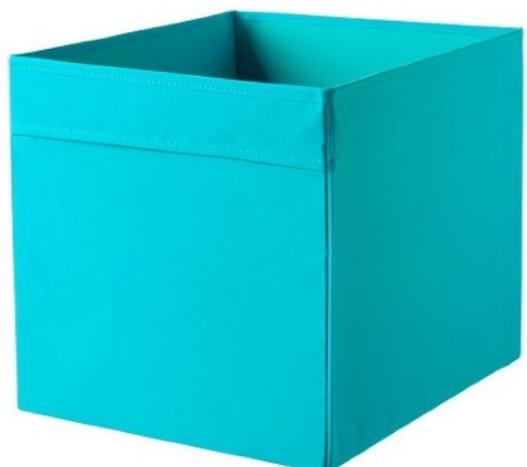
The variable `animal` gets  
the value "`a bunny`"



This is very problematic.  
Why am I in a box? And I'm  
not an animal. I'm a sentient  
organism with a deep and  
meaningful inner life.



There are many different  
colours of boxes



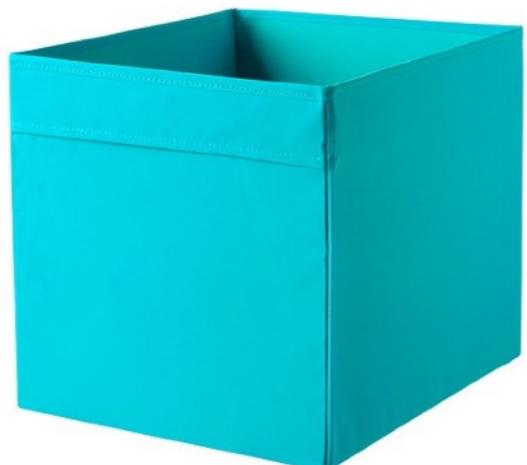
There are many different  
**classes** of variable





“**numeric**” variables store numbers

```
annoyingness <- 8
```



“**character**” variables store text

```
animal <- “a bunny”
```



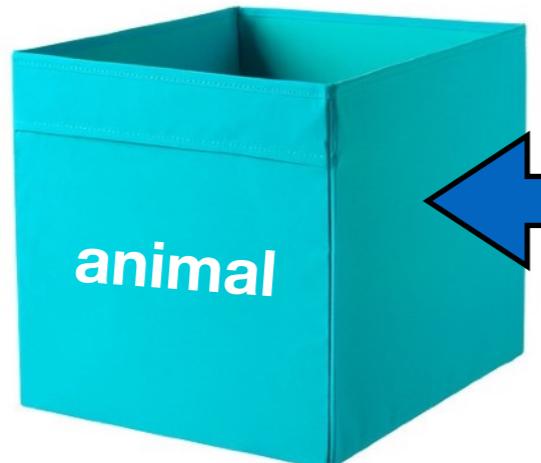
“**logical**” variables store true/false

```
isFurry <- TRUE
```



numeric

8



character

“a bunny”

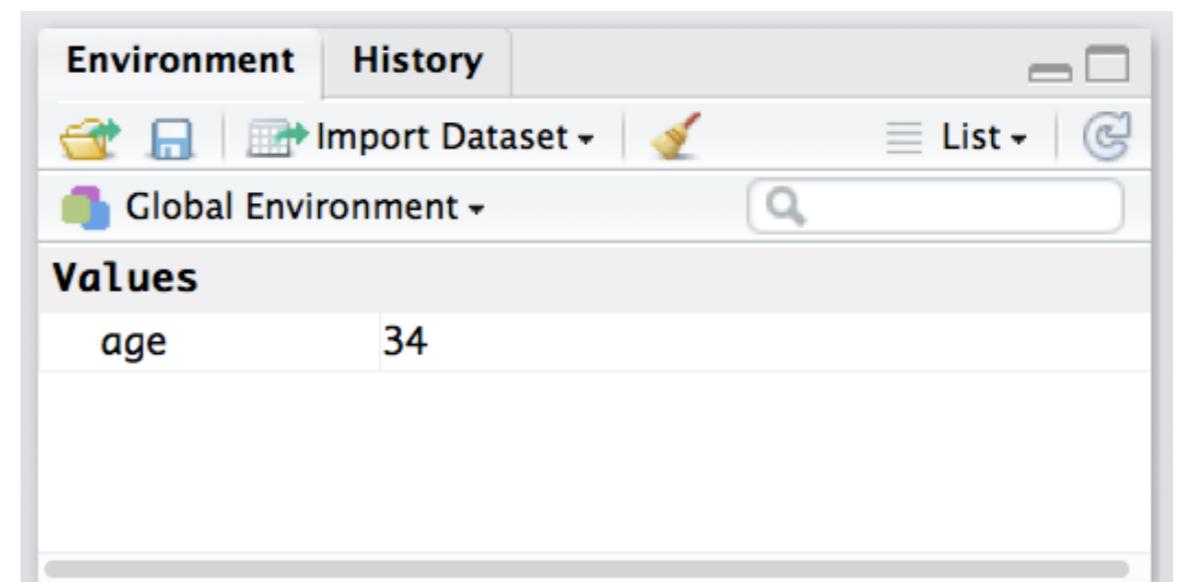
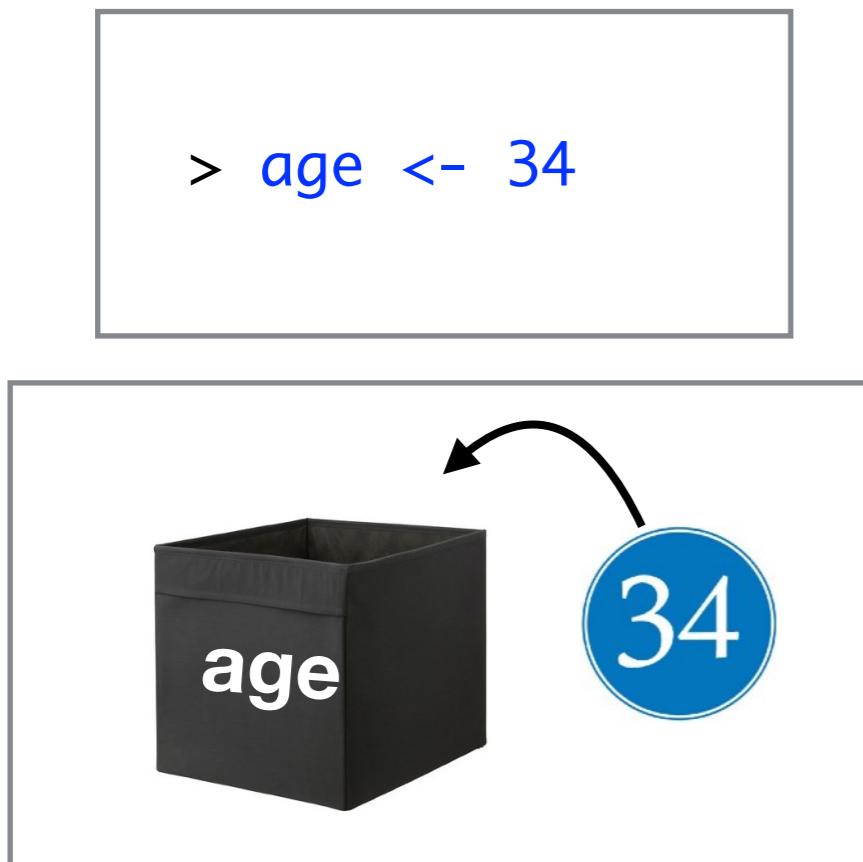


logical

TRUE

# Creating variables

- Variables are used to store information
- They provide a way of labelling information
- They refer to the contents of a block of computer memory
- Use the “assignment operator” `<-` to create one



No output appears in the console, but the variable shows up in the Rstudio “environment” panel

Using = instead of <- for assignment



# Working with variables

- Variables in R behave exactly the same way as their values do
- $34 * 2$  is meaningful, “yellow” \* 2 is not
- So...

```
> 34 * 2  
[1] 68
```

```
> "yellow" * 2  
Error in "yellow" * 2 : BLAH BLAH BLAH
```

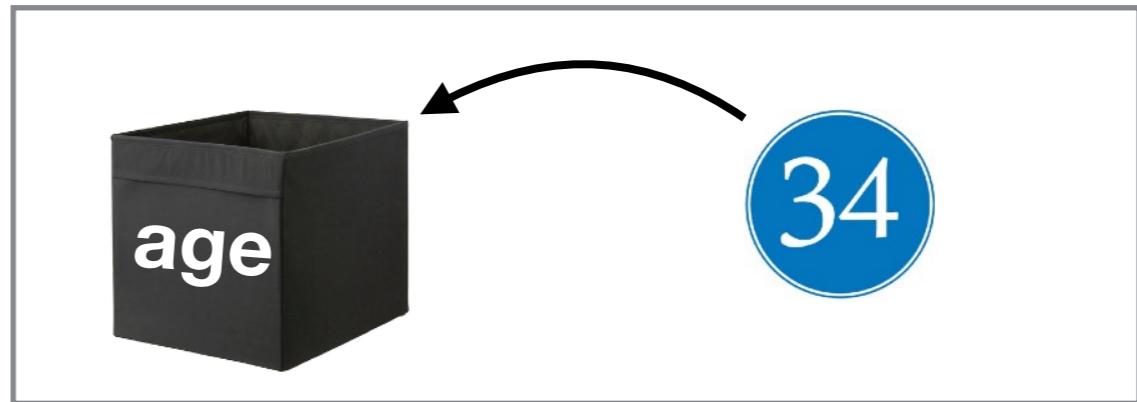
```
> age <- 34  
> age * 2  
[1] 68
```

```
> myColour <- "yellow"  
> myColour * 2  
Error in myColour * 2 : BLAH BLAH BLAH
```

# Using variables doesn't change the value

Define variable

```
> age <- 34  
> age  
[1] 34
```



Get R to print age+10

```
> age+10  
[1] 44
```



Age is still 34

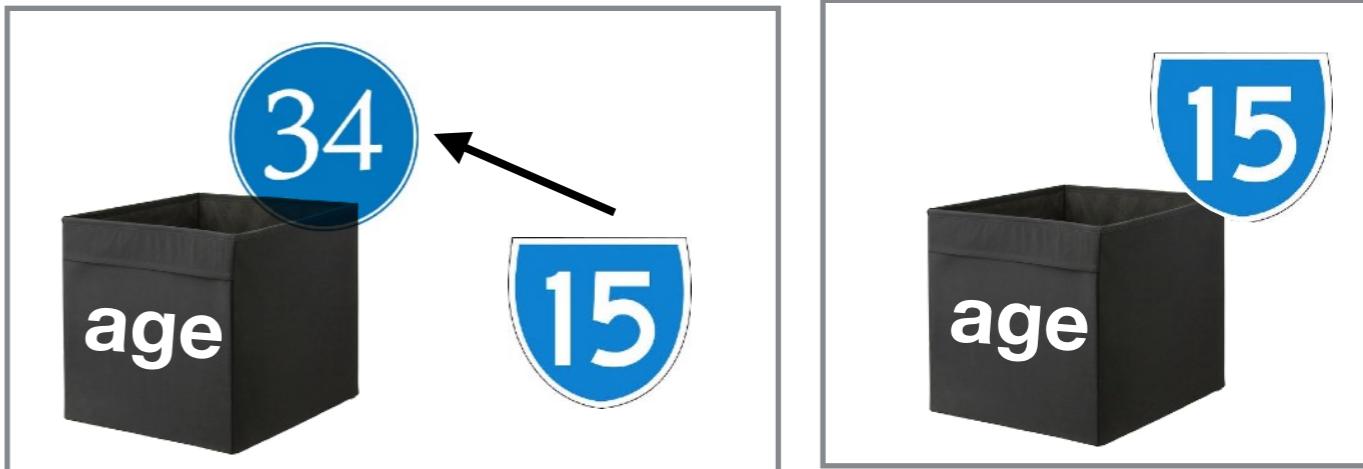
```
> age  
[1] 34
```



# Reassigning values

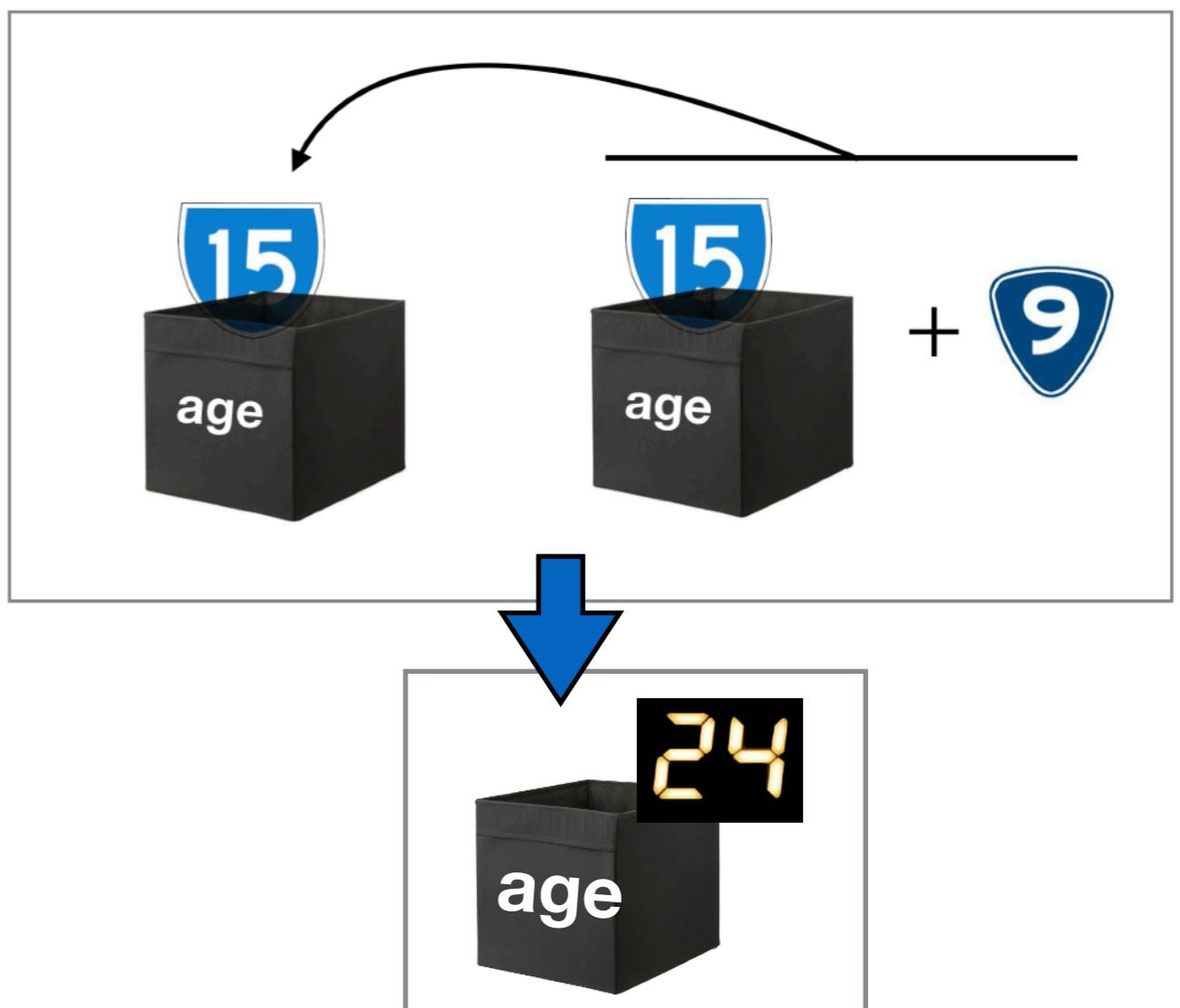
Assigning a new value makes the old one vanish

```
> age <- 15  
> age  
[1] 15
```



You can assign a new value based on the old one

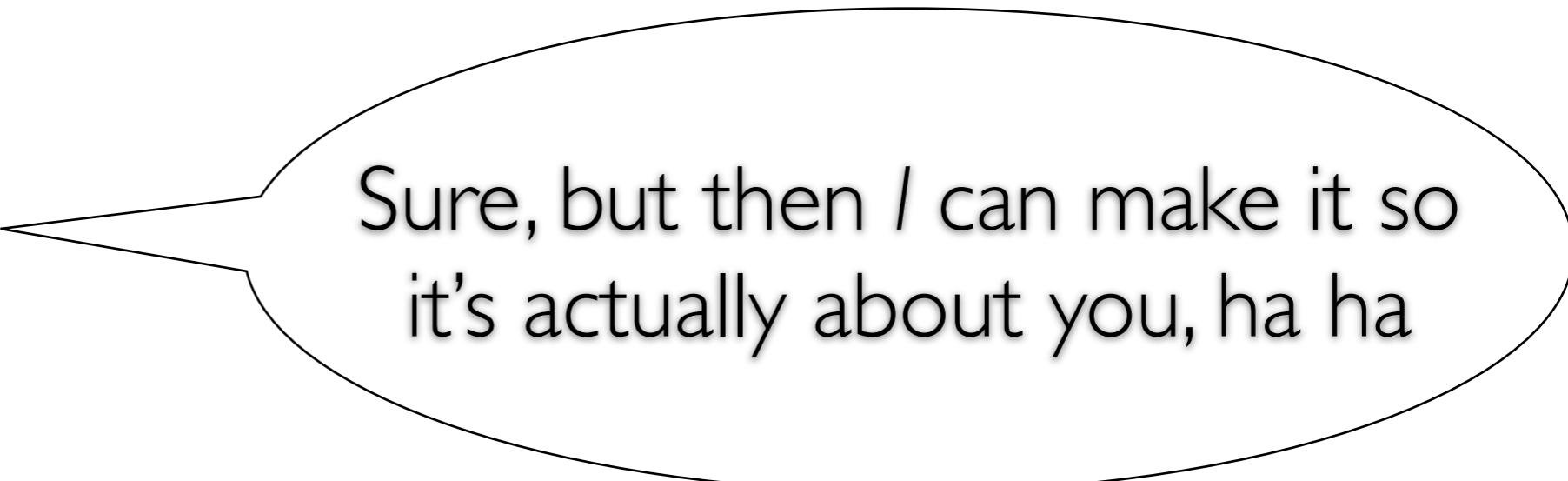
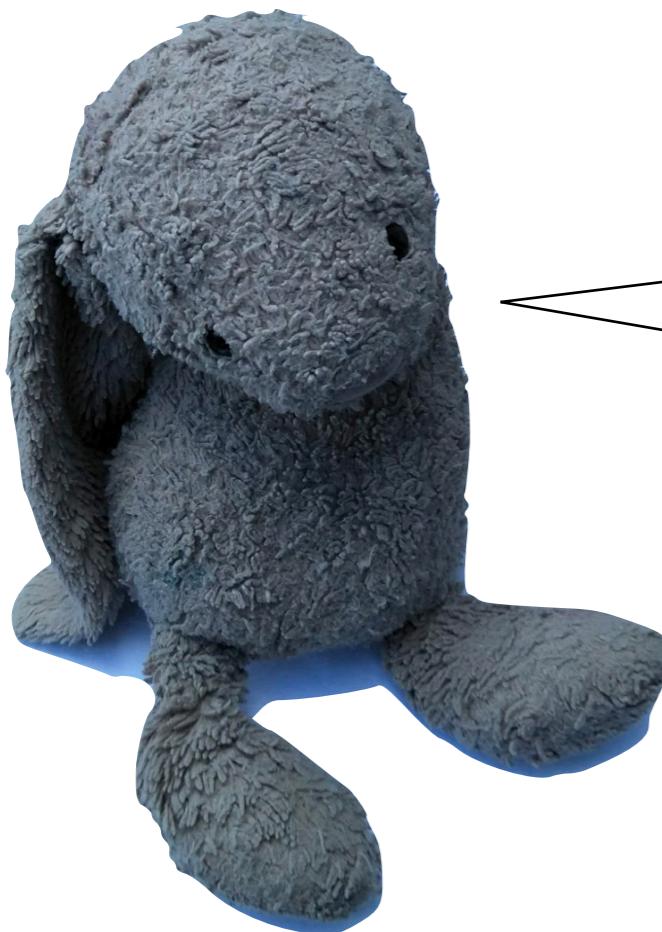
```
> age <- age + 9  
> age  
[1] 24
```





Oh! So I can say Bunny is even more annoying than you did?

```
annoyingness <- annoyingness + 100
```



Sure, but then I can make it so it's actually about you, ha ha

```
animal <- "a bear"
```

# Note on variable names

You can name your variable most things, but not *anything*.

yes

A-Z  
a-z  
0-9  
. -

(space)  
?!+=  
etc

no

Must start with a letter or a period. Can't be a reserved keyword (like TRUE). Don't worry too much about this, R will yelp if you do it.

# Note on variable names

Try to use simple, informative names that follow a convention.

these  
are  
good

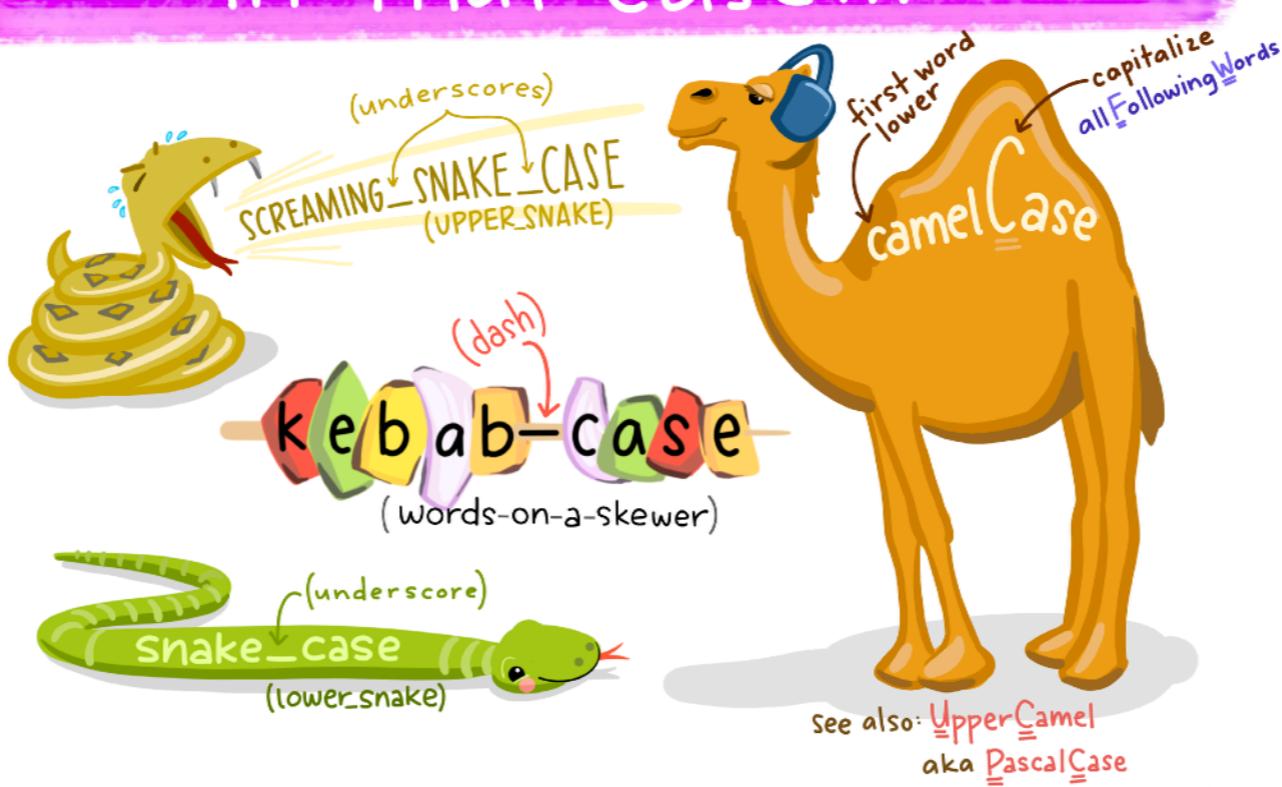
age  
bodyTemp  
favouriteColour  
salary

variable  
f827va4.x

the\_favourite\_colour\_of\_each\_person\_in\_the\_dataset

these  
are not  
great

in that case...



@alison\_horst

Art by @alison\_horst

Digression: What happens if you try  
quit R after creating some variables?

# Hm. What's all this then?

```
> q()  
Save workspace image to ~/.RData? [y/n/c]: |
```

Save “workspace image”? What’s this about????

# The “workspace”

- All the variables you currently have are called a workspace
  - We'll talk about what this means later
- 
- What R is asking is if you want to keep your variables for later
  - It stores them in a “special” file.
  - Right now, the answer is “no”.
- 
- In general, I think it's a bad idea to let R do this.
  - Personally, I prefer to choose where my variables get stored

# Exercises

1. Make a variable called `name` with your first name in it. Now make a variable called `name` with your last name. What has happened? How do you make one with your complete name? (Note: there are several ways to do this)
2. Make a variable called `x` and set it equal to 2. Then set it equal to itself plus 2. What is it now?
3. Make a variable called `y` and set it to TRUE. Then add three to it. What happens? How is this different if you set it to FALSE instead? What do you think is going on?