



STRING MANIPULATION WITH STRINGR

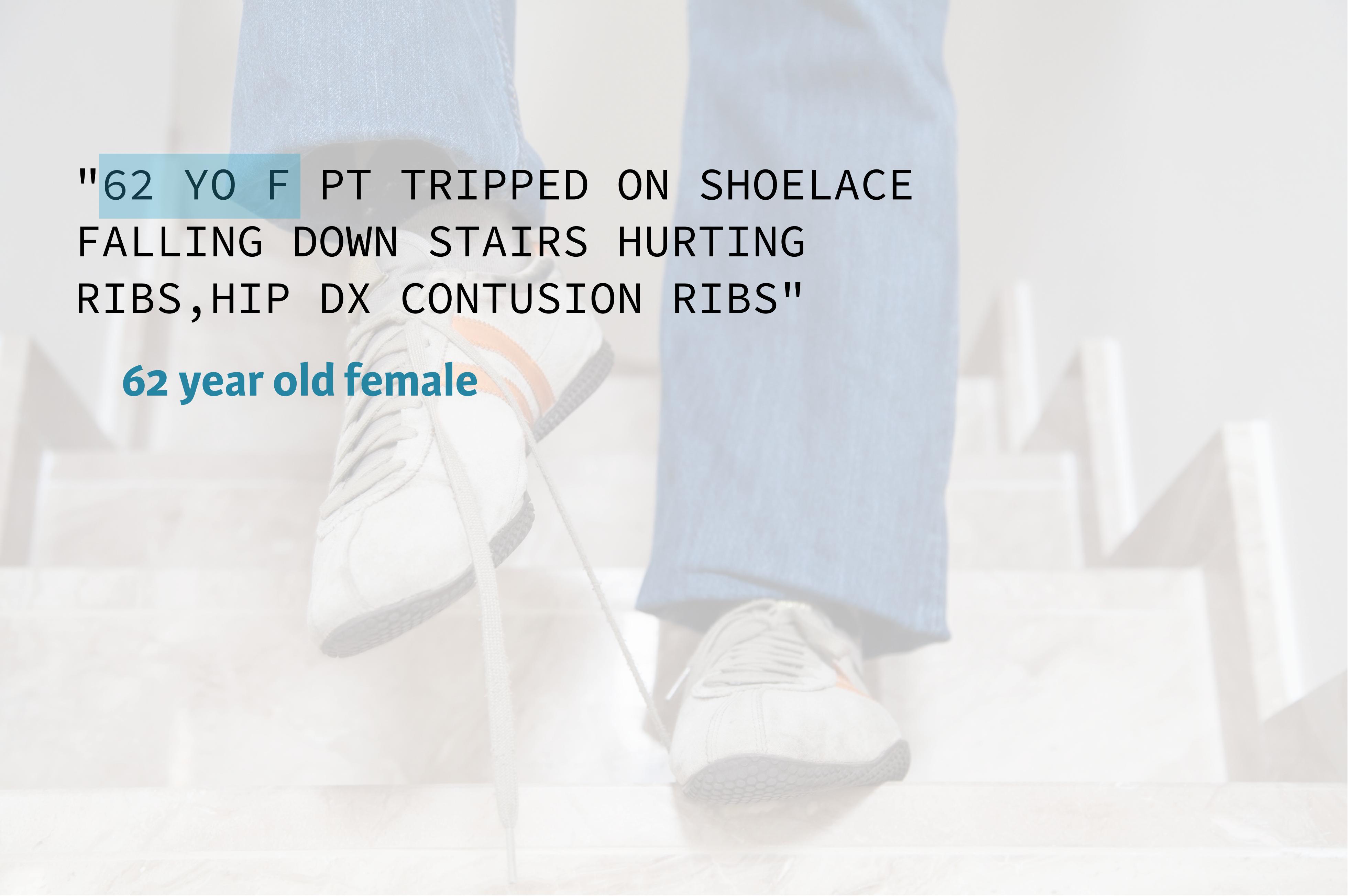
Welcome!

You will learn:

- stringr for manipulating strings
- Regular expressions using rebus

```
"TTAAGGAAACGATCGTACGCATGATAGGGTTTGCAGTG  
ATATTAGTGTCTCGGTTGACTGGATCTCATCAATAGTCT  
GGATTGGTTGATAAGTACCTGCTGCAATGCATCAATGG  
ATTTACACATCACTTAATAAAATATGCTGTAGTGGCCAG  
TGGTGTAAATAGGCCTCAACCACCTCTTCTAAGCTTCCA  
ATTTTTCAAGGCCGAAGGGTAATCTTGGCCTTTCA  
AGATTATGCCAACAAAAGCAGCAAACGTCGTAACCCAGTT  
GTTTGGGTTAACGTGTACACAAGCTGCGGTAATGATCC  
CTGCTTGCCGCATCTTCTACTCTTACATGAATAGTTC  
CGGGGCTAACAGCGAGGTTTTGGCTAACATTAGCATAGG  
GTGTGCGTGCATTCCATTAAATGCTTCAGGATGCTGC  
GATCGAGATTATCGATCTGATAAAATTCACTCAT"
```

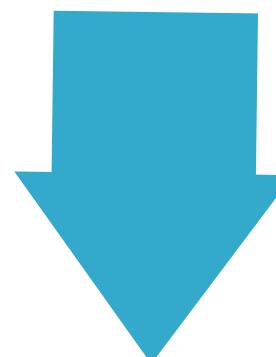
"TTAAGGAACGATCGTACGCATGATAGGGTTTGCAGTG
ATATTAGTGTCTCGGTTGACTGGATCTCATCAATAGTCT
GGATTGGTTGATAAGTACCTGCTGCAATGCATCAATGG
ATTTACACATCACTTAATAAAATATGCTGTAGTGGCCAG
TGGTGTAAATAGGCCTCAACCACCTCTTCTAAGCTTCCA
ATTTTTT**C**AAGGCCGAAGGGTAATCTTGGC**A**CTTTCA
AGATTATGCCAATAAAAGCAGCAAACGTCGTAACCCAGTT
GTTTGCGGTTAACGTGTACACAAGCTGCGGTAATGATCC
CTGCTTGCCGCATCTTCTACTCTTACATGAATAGTTC
CGGGGCTAACAGCGAGGTTTTGGCTAATTAGCATAGG
GTGTGCGTGCATTCCATTAAATGCTTCAGGATGCTGC
GATCGAGATTATCGATCTGATAAAATTCACTCAT"



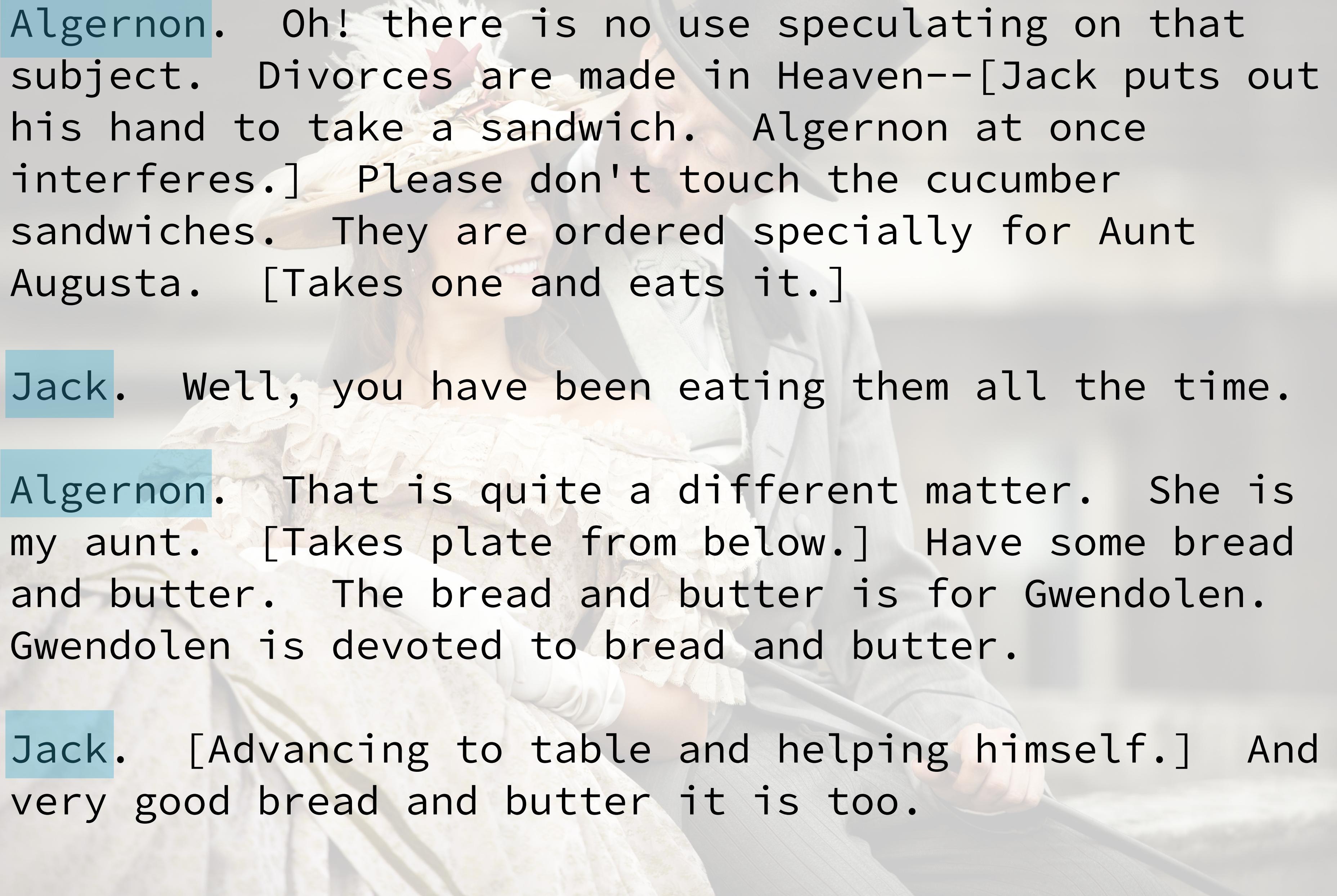
"62 YO F PT TRIPPED ON SHOELACE
FALLING DOWN STAIRS HURTING
RIBS, HIP DX CONTUSION RIBS"

62 year old female

```
[1] "Call me at 555-555-0191"  
[2] "123 Main St"  
[3] "(555) 555 0191"  
[4] "Phone: 555.555.0191 Mobile: 555.555.0192"
```



```
[1] "Call me at XXX-XXX-XXXX"  
[2] "XXX Main St"  
[3] "(XXX) XXX XXXX"  
[4] "Phone: XXX.XXX.XXXX Mobile: XXX.XXX.XXXX"
```

A woman in a white dress is smiling and holding a plate of sandwiches.

Algernon. Oh! there is no use speculating on that subject. Divorces are made in Heaven--[Jack puts out his hand to take a sandwich. Algernon at once interferes.] Please don't touch the cucumber sandwiches. They are ordered specially for Aunt Augusta. [Takes one and eats it.]

Jack. Well, you have been eating them all the time.

Algernon. That is quite a different matter. She is my aunt. [Takes plate from below.] Have some bread and butter. The bread and butter is for Gwendolen. Gwendolen is devoted to bread and butter.

Jack. [Advancing to table and helping himself.] And very good bread and butter it is too.

Chapter 1

- How to enter strings
- How to control numbers as strings
- Combine strings into sentences and tables

Entering strings

```
> "hi!"  
[1] "hi!"
```

Entering strings

```
> "hi!"  
[1] "hi!"  
  
> # I said "hi!"  
> "I said "hi!""  
Error: unexpected symbol in ""I say "hi"
```

Entering strings

```
> "hi!"  
[1] "hi!"  
  
> # I said "hi!"  
> "I said "hi!""  
Error: unexpected symbol in ""I say "hi"  
  
> 'I said "hi!"'  
[1] "I said \"hi!\\""
```

A single quote

An escape sequence

Entering strings

```
> "hi!"  
[1] "hi!"  
  
> # I said "hi!"  
> "I said "hi!""  
Error: unexpected symbol in ""I say "hi"  
  
> 'I said "hi!"'  
[1] "I said \"hi!\""  
  
> "I said \"hi!\""  
[1] "I said \"hi!\""
```

An escaped double quote

When to use " vs. '

```
> "hi!"  
[1] "hi!"
```

No quotes in the string, use double quotes

When to use " vs. '

```
> "hi!"  
[1] "hi!"
```

No quotes in the string, use double quotes

```
> 'I said "hi!"'  
[1] "I said \"hi!\""
```

Doubles quotes in the string, use single quotes

When to use " vs. '

```
> "hi!"  
[1] "hi!"
```

No quotes in the string, use double quotes

```
> 'I said "hi!"'  
[1] "I said \"hi!\""
```

Doubles quotes in the string, use single quotes

```
> "I'd say \"hi!\""  
[1] "I'd say \"hi!\""
```

Doubles and single quotes in the string,
use double quotes



STRING MANIPULATION WITH STRINGR

Let's practice!



STRING MANIPULATION WITH STRINGR

**Turning numbers
into strings**

Turning a number into a string

```
> estimate <- 1.34019029100          $1.34  
  
> as.character(estimate)  
[1] "1.340190291"  
  
> format(estimate, digits = 3)  
[1] "1.34"  
  
> formatC(estimate, format = "f", digits = 2)  
[1] "1.34"
```

Fixed and scientific formats

- Fixed: decimal point between ones and tenths
- Scientific: decimal point after first digit

6371 km

6371.0

6.371×10^3

Fixed and scientific formats

19890000000000000000000000000000 kg → 1.989×10^{30}

0.00000000008 kg → 8×10^{-12} kg

```
> 19890000000000000000000000000000  
[1] 1.989e+30
```

```
> 0.00000000008  
[1] 8e-12
```

format() and formatC()

```
> x <- c(19890000000000000000000000000000, 0.00000000008)

> format(x, scientific = TRUE)
[1] "1.989e+30" "8.000e-12"

> format(x, scientific = FALSE)
[1] "198899999999999901909255192576.00000000000"
[2] "0.00000000008"

> formatC(x, format = "f")
[1] "198899999999999901909255192576.0000"
[2] "0.0000"

> formatC(x, format = "e")
[1] "1.9890e+30" "8.0000e-12"

> formatC(x, format = "g")
[1] "1.989e+30" "8e-12"
```



STRING MANIPULATION WITH STRINGR

Let's practice!



STRING MANIPULATION WITH STRINGR

Putting strings together

paste()

```
> paste("E", "I", "E", "I", "O")
[1] "E I E I O"

> paste("E", "I", "E", "I", "O", sep = "-")
[1] "E-I-E-I-O"

> paste(c("Here", "There", "Everywhere"), "a")
[1] "Here a"        "There a"       "Everywhere a"
```

```
paste( c("Here",           , "a" ) → "Here a"
      "There",          "a"   → "There a"
      "Everywhere")    "a"   → "Everywhere a"
```



paste()

```
> animal_goes <- "moo"
```

paste()

```
> animal_goes <- "moo"  
  
> paste(c("Here", "There", "Everywhere"), "a"), animal_goes)  
[1] "Here a moo"          "There a moo"        "Everywhere a moo"
```

paste()

```
> animal_goes <- "moo"

> paste(c("Here", "There", "Everywhere"), "a"), animal_goes)
[1] "Here a moo"          "There a moo"        "Everywhere a moo"

> paste(c("Here", "There", "Everywhere"), "a"), animal_goes,
  collapse = ", ")
[1] "Here a moo, There a moo, Everywhere a moo"
```

paste()

```
> animal_goes <- "moo"

> paste(c("Here", "There", "Everywhere"), "a"), animal_goes)
[1] "Here a moo"          "There a moo"        "Everywhere a moo"

> paste(c("Here", "There", "Everywhere"), "a"), animal_goes,
  collapse = ", ")
[1] "Here a moo, There a moo, Everywhere a moo"

> paste(c("Here", "There", "Everywhere"), "a",
  c(animal_goes, animal_goes,
    paste(rep(animal_goes, 2), collapse = "-"))),
  collapse = ", ")
[1] "Here a moo, There a moo, Everywhere a moo-moo"
```

paste()

```
> old_mac <- function(animal, animal_goes){
  eieio <- paste("E", "I", "E", "I", "O", sep = "-")
  old_mac <- "Old MacDonald had a farm"
  writeLines(c(
    old_mac,
    eieio,
    paste("And on his farm he had a", animal),
    eieio,
    paste(c("Here", "There", "Everywhere"), "a",
          c(animal_goes, animal_goes,
             paste(rep(animal_goes, 2), collapse = "-"))),
    collapse = ", "),
    old_mac,
    eieio))
}
```

```
> old_mac("cow", "moo")
Old MacDonald had a farm
E-I-E-I-O
And on his farm he had a cow
E-I-E-I-O
Here a moo, There a moo, Everywhere a moo-moo
Old MacDonald had a farm
E-I-E-I-O
```

```
> old_mac("cow", "moo")
Old MacDonald had a farm
E-I-E-I-O
And on his farm he had a cow
E-I-E-I-O
Here a moo, There a moo, Everywhere a moo-moo
Old MacDonald had a farm
E-I-E-I-O

> old_mac("dog", "woof")
Old MacDonald had a farm
E-I-E-I-O
And on his farm he had a dog
E-I-E-I-O
Here a woof, There a woof, Everywhere a woof-woof
Old MacDonald had a farm
E-I-E-I-O
```



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