Lab 01: CS631

Working in R

Alison Hill

R Basics

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- R is an interpreter ( )
- Name objects in R ( )
- Know your object types ( )
- Case matters ( )
- Use comments! ( )
- Functions (!)
- Use packages (*"install once per machine, load once per R session"*)
- Use the (*"dataframe first, dataframe once"*)

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- The means your last command isn't complete
  - If you get stuck with a use your escape key!

🐍

Name Objects in R

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RStudio Keyboard Shortcuts:

OSX: +

Else: +

(the + means and, not the + key)

Name your own objects

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Re-name others' objects

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What to name objects?

Object names cannot:

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- Contain "reserved" words

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Object names must:

- Start with a letter
- Contain letters, numbers, and

Adopt a consistent naming style

From: http://r4ds.had.co.nz/workflow-basics.html#whats-in-a-name

Read more: http://style.tidyverse.org/syntax.html#object-names

🔦

Know Your Data Types

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- Numeric (2 subtypes)
  - Integers ( )
  - Double (,)
- Character ( )
- Factor ( )
- Logical ( )

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Characters can be deceiving

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is special

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Case matters

Case matters

This works:

Case matters

This works:

These do not:

📢

Comments

Text behind a is a comment

Text behind a is a comment

Text behind a is a comment

🍰

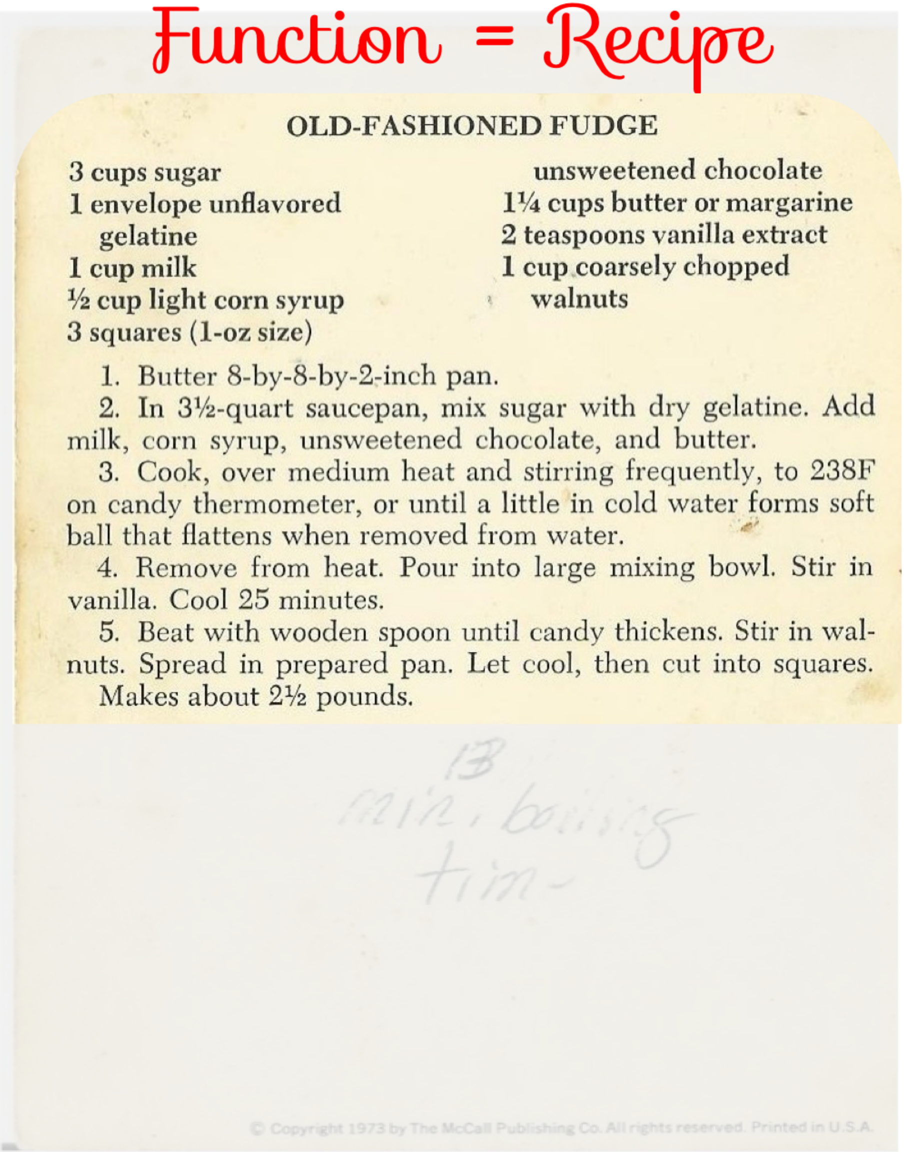
Functions

Function = Recipe

HOLIDAYS 15k

OLD-FASHIONED FUDGE

McCall's Great American Recipe Card Collection



OLD-FASHIONED FUDGE

3 cups sugar
1 envelope unflavored gelatine
1 cup milk
½ cup light corn syrup
3 squares (1-oz size) unsweetened chocolate
1¼ cups butter or margarine
2 teaspoons vanilla extract
1 cup coarsely chopped walnuts

1. Butter 8-by-8-by-2-inch pan.
2. In 3½-quart saucepan, mix sugar with dry gelatine. Add milk, corn syrup, unsweetened chocolate, and butter.
3. Cook, over medium heat and stirring frequently, to 238F on candy thermometer, or until a little in cold water forms soft ball that flattens when removed from water.
4. Remove from heat. Pour into large mixing bowl. Stir in vanilla. Cool 25 minutes.
5. Beat with wooden spoon until candy thickens. Stir in walnuts. Spread in prepared pan. Let cool, then cut into squares.

Makes about 2½ pounds.

13
min, boiling
tim-

https://mccallumvintagerecipedivas.wordpress.com

Ingredients = Arguments

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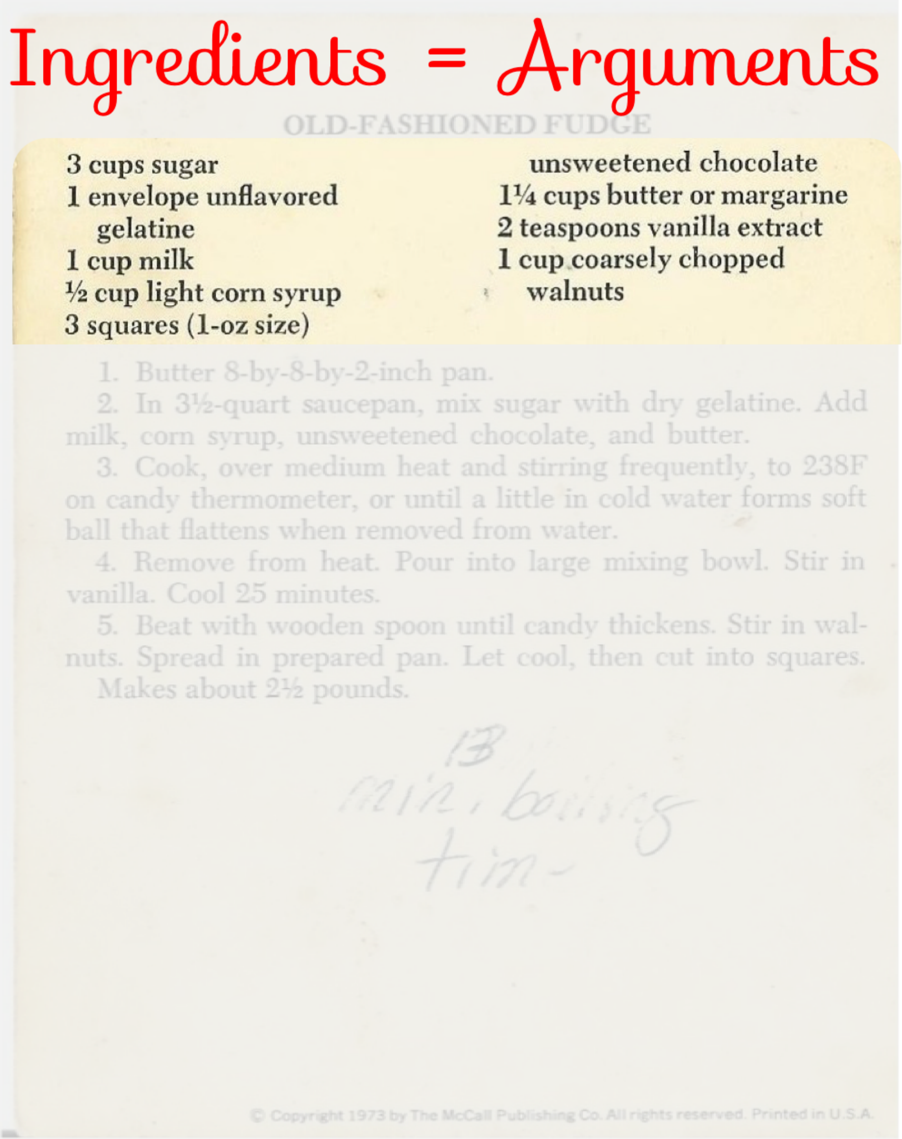

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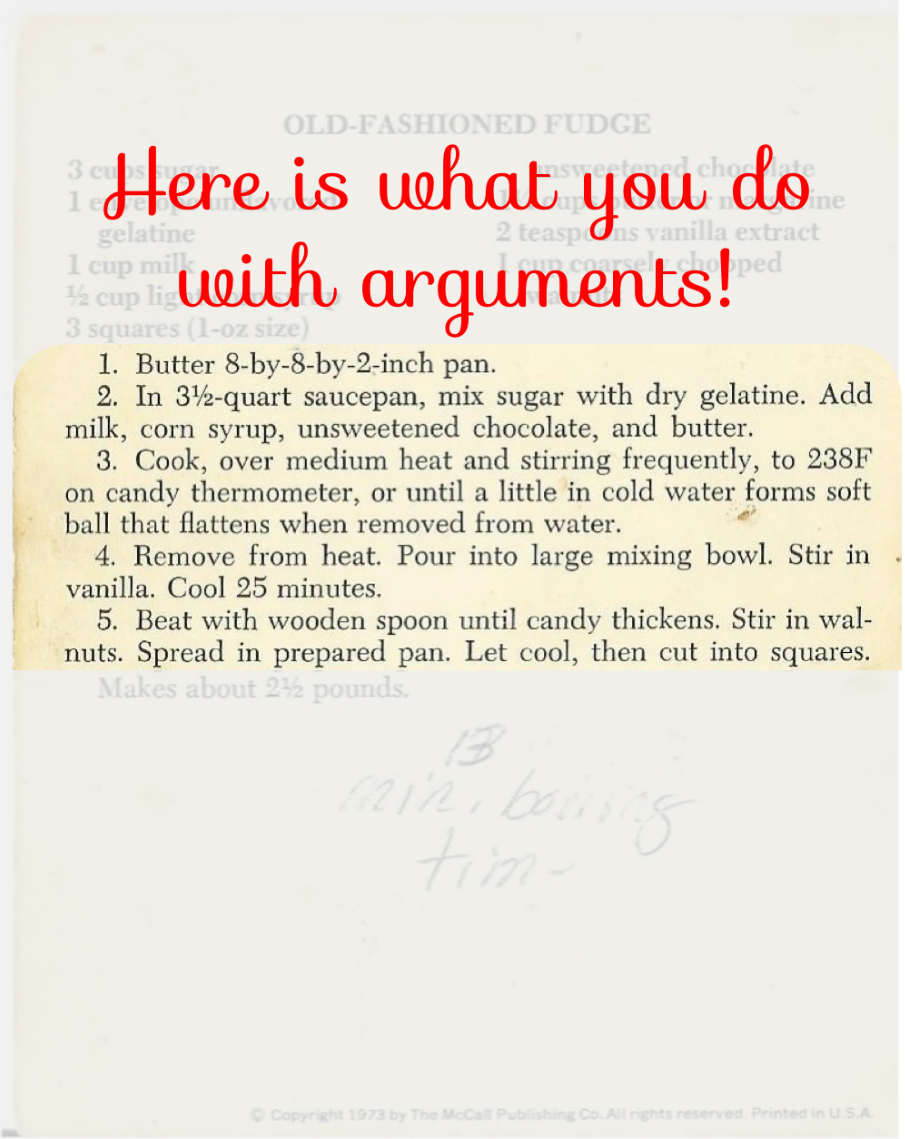
Here is what you do with arguments!



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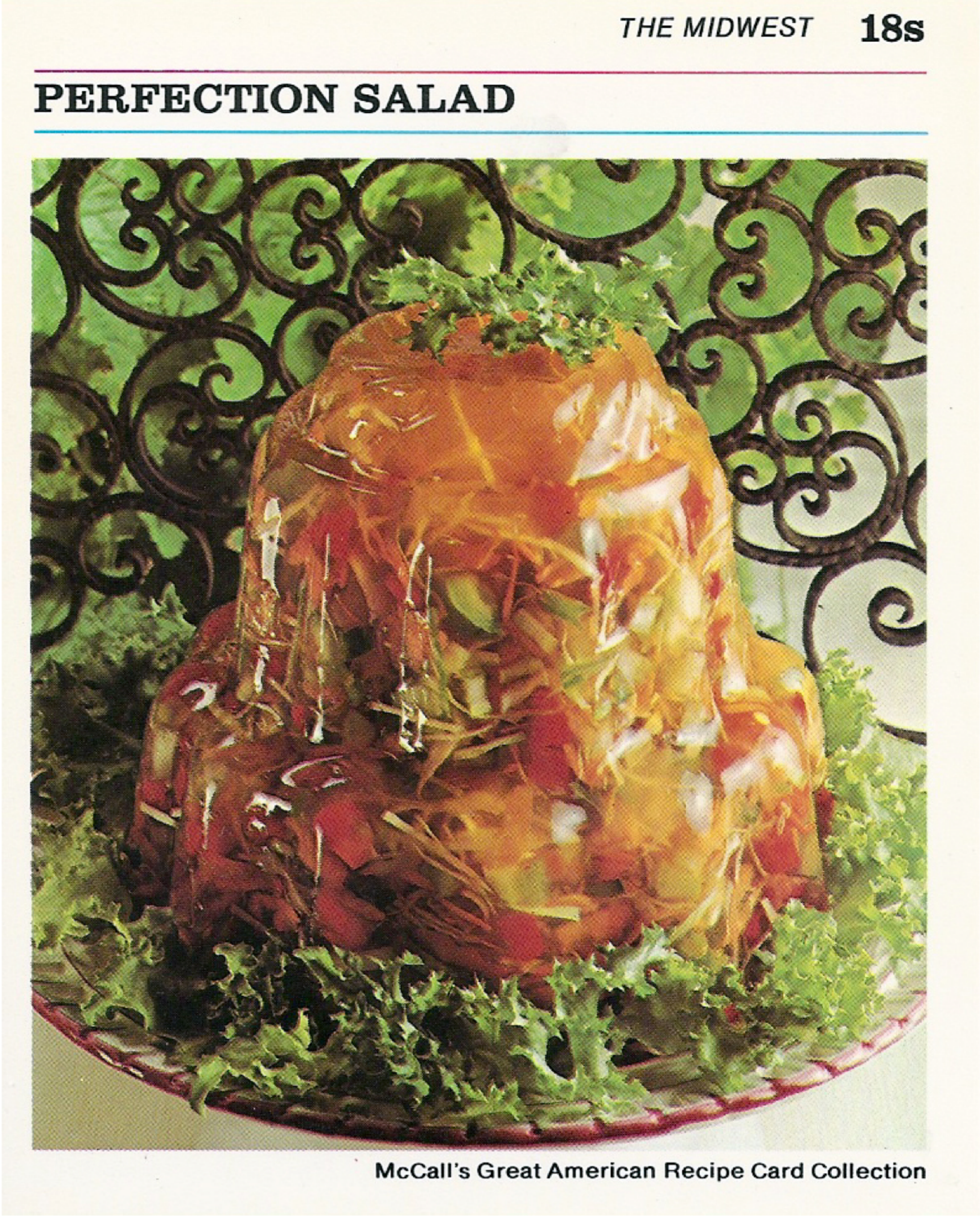

THE MIDWEST 18s

PERFECTION SALAD

McCall's Great American Recipe Card Collection

Some packages/functions are better than others…

Functions

Sometimes abbreviated in documentation, which is a little ironic 😉 .

Functions can come from:

- base R (these functions are "built in")
- packages
- you

Base R Functions

Functions from Packages

Roll Your Own Functions

Function help

Pay attention to:

Function help

Pay attention to:

- Usage *(recipe)*

Function help

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- Arguments *(ingredients)*

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- Examples

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Read more:

- http://r4ds.had.co.nz/workflow-basics.html#calling-functions
- http://socviz.co/appendix.html#a-little-more-about-r
- http://stat545.com/block011_write-your-own-function-01.html
- http://stat545.com/block011_write-your-own-function-02.html
- http://stat545.com/block011_write-your-own-function-03.html

📦

Packages

"install once per machine, load once per R session"

Packages!

Install once per machine

Packages!

Install once per machine

Load once per R work session

Packages!

Install once per machine

Load once per R work session

also: quotes matter, sorry

The package ecosystem

https://www.tidyverse.org

"The tidyverse is an opinionated collection of R packages designed for data science. All packages share an underlying design philosophy, grammar, and data structures."

See packages included here: https://www.tidyverse.org/packages/

The pipe

"dataframe first, dataframe once"

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Piping a dataframe into a function lets you read L to R

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Here, the "sentence" starts with a verb.

Piping a dataframe into a function lets you read L to R

Now, the "sentence" starts with a noun.

Sequences of functions make you read *inside out*

Sequences of functions make you read *inside out*

Chaining functions together lets you read *L to R*

"dataframe first, dataframe once"

This does the same thing:

This does the same thing:

So does this:

I know...

I promise, it gets better.

🏃

Resources for Working in R:

http://r4ds.had.co.nz/workflow-basics.html

http://moderndive.com/2-getting-started.html

https://bookdown.org/chesterismay/rbasics/3-rstudiobasics.html

https://github.com/rstudio/cheatsheets/blob/master/rstudio-ide.pdf

Install & load multiple R packages

This can get to be a long list if we want to use a lot of new packages in our work session. We can make a function to load a *list* of packages, and install them if not already installed (more on functions later).

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Function from: https://gist.github.com/stevenworthington/3178163