Model Basics

READING:	0.1
EXERCISES:	ALL CHAPTER 0
ASSIGNED:	HW 1
PRODUCER:	DR. MARIO

Course Website / Syllabus

- Access Course Website Through Canvas
- Cover Syllabus
  - Office Hours
  - Grading and Curving
  - Attendance: UNC Check-In App
  - Homework
  - Quizzes
  - Exams
  - PDFs and Gradescope
  - Grade Disputes
  - Honor Code
- Usage of Course Website and Canvas

Preview of Dataset

LEGO Dataset (n=1304)

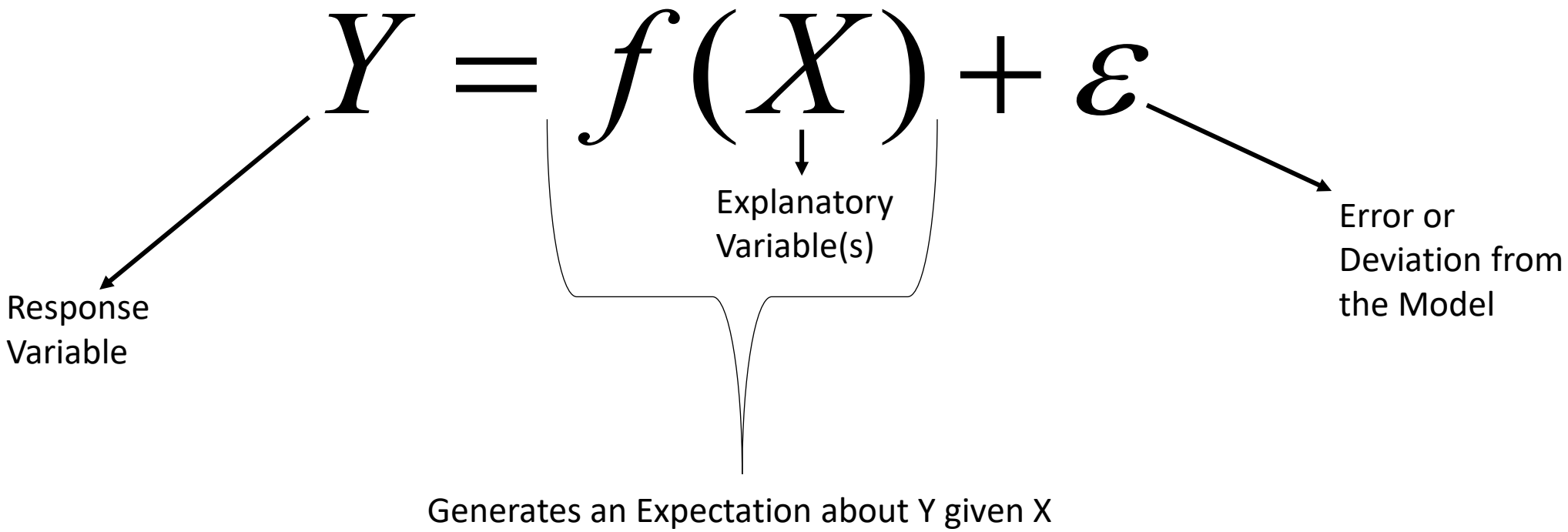
Set_Name	Theme	Pieces	Price	Amazon_Price	Year	Ages	Minifigures	Unique_Pieces
<chr>	<chr>	<dbl>	<dbl>	<dbl>	<dbl>	<chr>	<dbl>	<dbl>
Imperial Star Destroyer	Star Wars	4784	700.	700.	2019	Ages_16+	2	445
Betrayal at Cloud City	Star Wars	2812	350.	668.	2018	Ages_14+	19	676
Liebherr R 9800	Powered UP	4108	450.	443.	2019	Ages_12+	NA	221
NINJAGO City Docks	NINJAGO	3553	230.	440	2018	Ages_12+	14	690
Hogwarts Castle	Harry Potter	6020	400.	400.	2018	Ages_16+	28	624
Voltron	Ideas	2321	180.	389.	2018	Ages_16+	NA	471
Roller Coaster	Creator Expert	4124	380.	380.	2018	Ages_16+	11	556
Bugatti Chiron	Technic	3599	350.	340.	2018	Ages_16+	NA	306
Mack Anthem	Technic	2595	180.	330	2018	Ages_11-16	NA	253
Farm Adventures	DUPLO	104	60.0	300.	2018	Ages_2-5	3	42

Any interesting questions about LEGO we may want to answer?

Models Help Us…

- Answer Questions
- Make Predictions or Classifications
- Evaluate Treatments or Test Theories
- Understand Relationships

Architecture of a Model



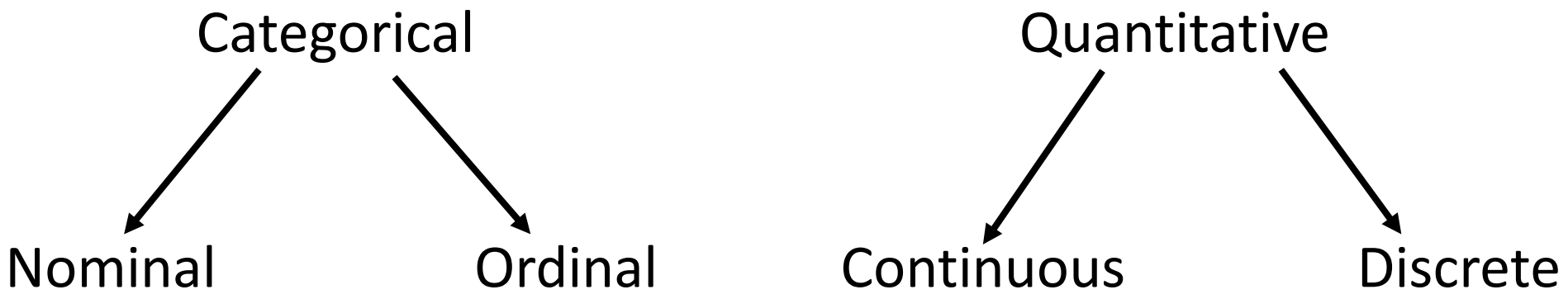
Statistical Modeling

Statistical Modeling is the Process of …

Defining the Function *f(X)* and then **Fitting that Function *f(X)***
to a sample dataset by **Minimizing the Error** the best we possibly can

Methodology we Use Depends on the Types of Variables

Variable Types



Preview of Dataset

Can we find all the variable types in this dataset?

Set_Name	Theme	Pieces	Price	Amazon_Price	Year	Ages	Minifigures	Unique_Pieces
<chr>	<chr>	<dbl>	<dbl>	<dbl>	<dbl>	<chr>	<dbl>	<dbl>
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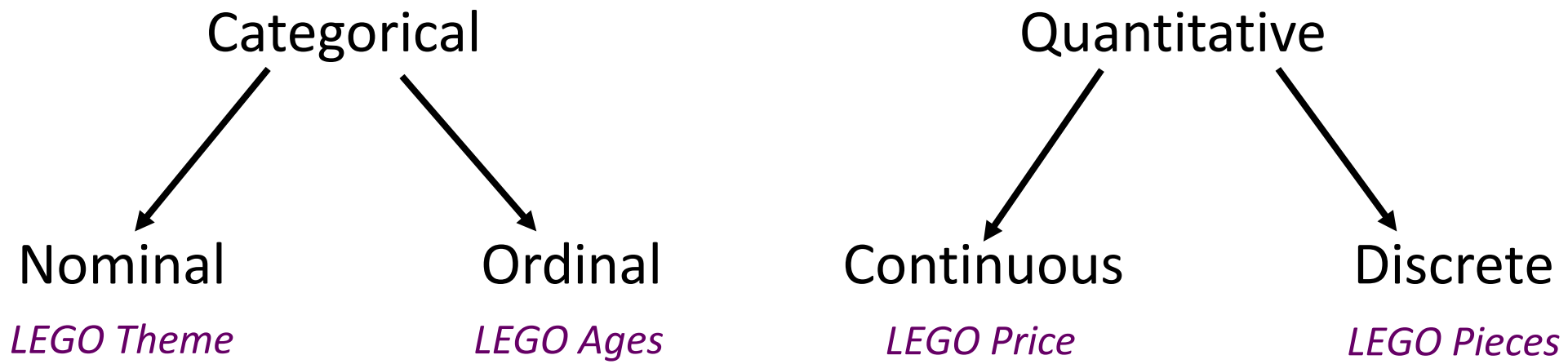
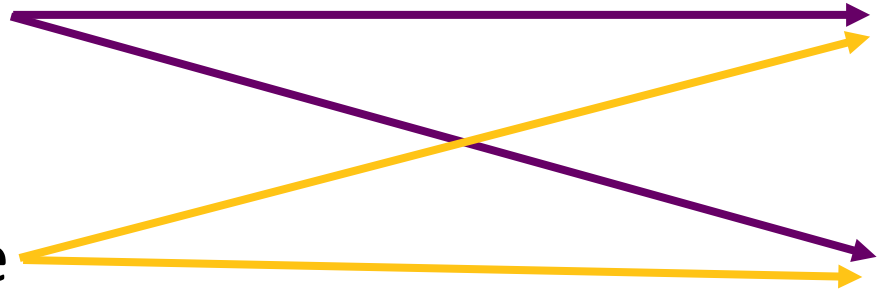
Example of Variable Types Using LEGO



Families of Models

Response Variable	Predictor Variable
Categorical	Categorical
Quantitative	Quantitative



*Complicated by **multiple** predictor variables and/or response variables*

Technology We Will Use

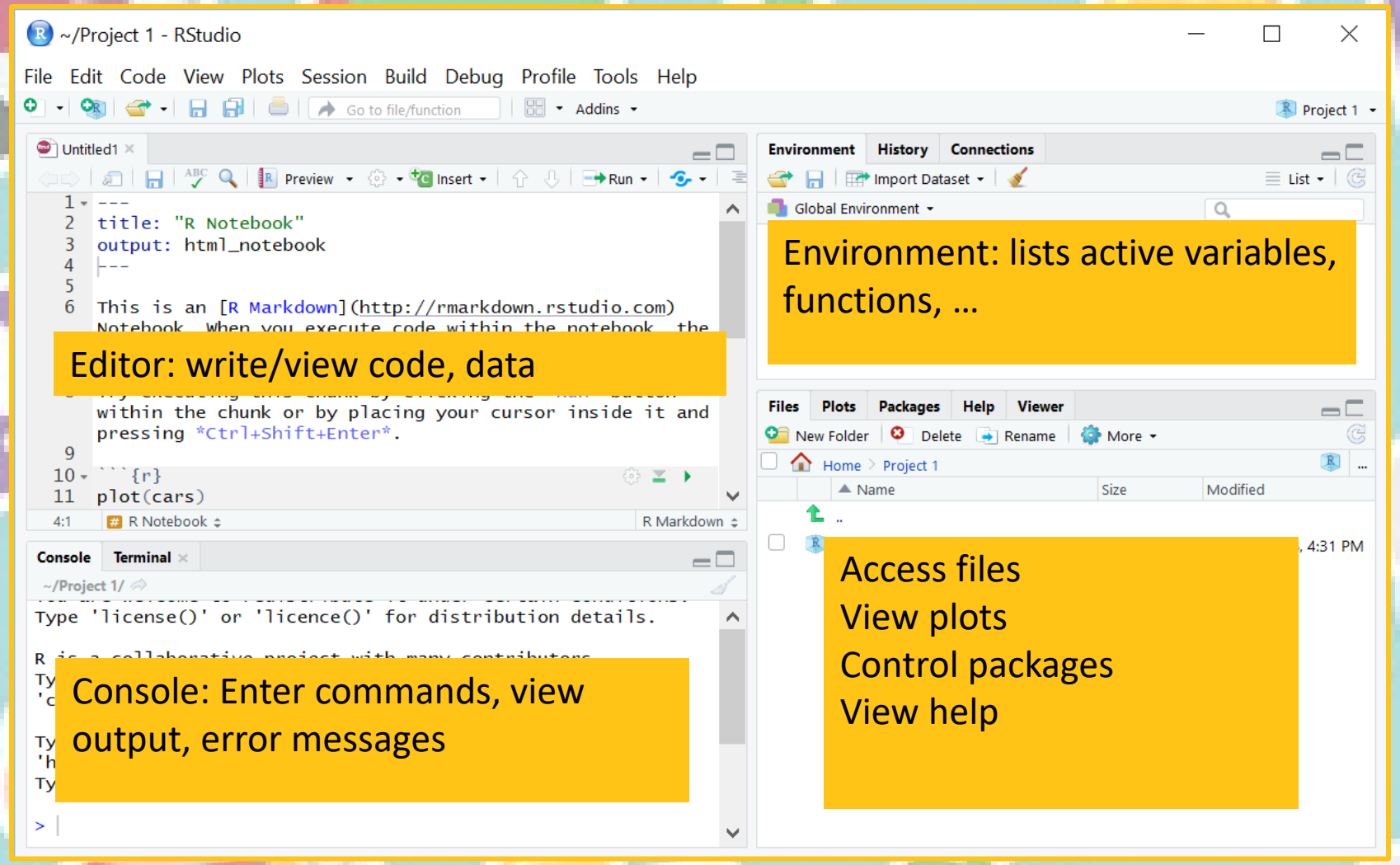
- *R* = a free, widely used, open source, language and environment for statistical computing and graphics
- *RStudio* = an interface for *R* (Integrated Development Environment)
- *RMarkdown* = a tool in R for creating documents that combine R code with text

Download R and RStudio to Your Computer

Supplement for Lecture 1

- Download Zip Folder on Course Website for Supplement
- Unzip Folder on Your Computer
- Open the Template.rmd File from the Unzipped Folder
- RMD Files Should Automatically Open in RStudio

Quick Look at R Studio



Learning Objectives for R

- Install Packages
- Load Packages
- Read CSV Files
- Create Objects
- Columns and Rows
- Subset Data
- Mathematical Calculations
- Statistical Functions

Thank You

Make Reasonable Decisions