Placeholder page for

Front-Cover

Placeholder page for

Inside-Cover

**Unit 1**

*(and room for notes!)*

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# Expressions, Values, and Errors

For each expression, if it produces an error when evaluated,

write what kind of error occurs:

* For division by zero errors, write "division by 0".
* For errors where the operator is given the wrong type, write "wrong type".
* Otherwise, write what the expression evaluates to.

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| --- | --- |
| Expression | Value, or Error? |
| 8 - 5.3 |  |
| 2 / 0 |  |
| "Three" \* 2 |  |
| (3 + 5) \* 3 |  |
| 1.5 \* "6" |  |
| (2 / (3 - (2 + 1))) |  |

# Identifiers and Expressions

Imagine the program below has been written in your definitions window:

x = (3 \* 2) - 2

y = x \* 1.5

For each expression, if it produces an error when evaluated,

write what kind of error occurs:

* For division by zero errors, write "division by 0".
* For errors where a variable hasn’t been defined, write “unbound id”
* Otherwise, write what the expression evaluates to.

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| **Expression** | **Value, or Error?** |
| y |  |
| x - 3 |  |
| (y - 1) \* z |  |
| (x + y) / 2 |  |
| x + y |  |

# **Unit 2**

*“What is the relationship between calories and sugar?”*

I hypothesize…

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# Animals

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| **Animal** | **Number-of-legs** |
| "Human" | 2 |
| "Ant" | 6 |
| "Spider" | 8 |
| "Bear" | 4 |
| "Snake" | 0 |

1. How many rows does this table have? \_\_\_\_\_\_\_\_\_\_\_
2. How many columns does this table have? \_\_\_\_\_\_\_\_\_\_\_
3. What are the names of the columns? \_\_\_\_\_\_\_\_\_\_\_
4. For the row with value “Human” in the **Animal** column, what is the value in the **Number-of-legs** column? \_\_\_\_\_\_\_\_\_\_\_
5. Circle the header row of this table

# Presidents and Nutrition

Answer the following questions about the presidents and nutrition tables, using your Unit-2 Pyret program:

1. How many columns does the presidents table have? \_\_\_\_\_\_\_\_\_
2. What are the names of the columns? \_\_\_\_\_\_\_\_\_
3. How many rows does the presidents table have? \_\_\_\_\_\_\_\_\_
4. Is the party column quantitative or categorical? \_\_\_\_\_\_\_\_\_
5. Is the data in the home-state column categorical? \_\_\_\_\_\_\_\_\_
6. If so, how many categories are there? \_\_\_\_\_\_\_\_\_
7. What is the home state of Millard Fillmore? \_\_\_\_\_\_\_\_\_
8. Who was the first president from the Federalist party? \_\_\_\_\_\_\_\_\_
9. How many columns does the nutrition table have? \_\_\_\_\_\_\_\_\_
10. How many rows does the nutrition table have? \_\_\_\_\_\_\_\_\_
11. How many grams of cholesterol does the Hamburger have? \_\_\_\_\_\_\_\_\_
12. Which food has the largest serving size? \_\_\_\_\_\_\_\_\_
13. Is the data in the calories column quantitative? If so, why?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# **Unit 3**

*“The average US Household makes more than $45,000/yr[[1]](#footnote-1). So why are so many people living in poverty?”*

I hypothesize…

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# Mean, Median, Mode Practice

Using pencil & paper, calculate the 3 numbers that measure the center of each list. If a list contains more than one mode, write the number with the smallest value.

These lists are bound to variables a, b, c, d, e in the Unit 3 template file, so you can check your answers with Pyret.

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| --- | --- | --- | --- |
| **List** | **Mean** | **Median** | **Mode** |
| a = [list: 1, 1, 4] |  |  |  |
| b = [list: 3, 4, 5] |  |  |  |
| c = [list: 3, 3, 4, 6] |  |  |  |
| d = [list: -1, 0.5, 2, 0.5, 2, 6] |  |  |  |
| e = [list: 2, 11, 7, 4] |  |  |  |

# Measuring Center in Pyret

1. What is the mode of the calories-list? \_\_\_\_\_\_\_\_\_
2. What is the mean amount of sodium for menu items? \_\_\_\_\_\_\_\_\_
3. What is the median GDP for all the countries in countries? \_\_\_\_\_\_\_\_\_
4. What is the median of life-expectancy-list? \_\_\_\_\_\_\_\_\_

Imagine the following code is in your definitions window:

mystery-list = [list: 1, 2, 3, 4, 5, 6, 7, 8, 9]

1. What is the median of this mystery-list? \_\_\_\_\_\_\_\_\_

Now imagine these lists (which contain the same elements as mystery-list) are in your definitions window:

mystery1 = [list: 1, 4, 7]

mystery2 = [list: 2, 3, 8]

mystery3 = [list: 5, 6, 9]

1. What is the median of mystery1? \_\_\_\_\_\_\_\_\_
2. What is the median of mystery2? \_\_\_\_\_\_\_\_\_
3. What is the median of mystery3? \_\_\_\_\_\_\_\_\_
4. What is the median of a list containing these 3 medians? \_\_\_\_\_\_\_\_\_
5. Is this different from the median of mystery-list? \_\_\_\_\_\_\_\_\_

# **Unit 4**

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# Reading Charts

1. Which menu item has the most sodium? \_\_\_\_\_\_\_\_\_\_
2. Which menu item has the least sodium? \_\_\_\_\_\_\_\_\_\_
3. Do french fries have more sodium than hamburgers? \_\_\_\_\_\_\_\_\_\_
4. Which country has the largest GDP? \_\_\_\_\_\_\_\_\_\_
5. What percent of the total world GDP is from China? \_\_\_\_\_\_\_\_\_\_

# Frequency Bar Chart

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| --- | --- | --- |
| **First** | **Last** | **Eye-Color** |
| "John" | "Doe" | "Green" |
| "Jane" | "Smith" | "Brown" |
| "Javon" | "Jackson" | "Brown" |
| "Angela" | "Enriquez" | "Hazel" |
| "Jack" | "Thompson" | "Blue" |
| "Dominique" | "Rodriguez" | "Hazel" |
| "Sammy" | "Carter" | "Blue" |
| "Andrea" | "Garcia" | "Brown" |

1. How many students have Brown eyes? \_\_\_\_\_\_\_\_\_\_\_\_
2. How many students have Green eyes? \_\_\_\_\_\_\_\_\_\_\_\_
3. How many students have Hazel eyes? \_\_\_\_\_\_\_\_\_\_\_\_
4. How many students have Blue eyes? \_\_\_\_\_\_\_\_\_\_\_\_
5. Points scored

   image32.pngAbove the “Blue” label on this bar chart, add a bar with height that corresponds to the number of students with Blue eyes.

# Chart Practice



1. Is this a pie chart, or a bar chart? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Which pet is the most popular? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Which pet is the least popular? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Which are more popular, fish or rodents? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



1. Is this a bar chart or a pie chart? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What genre is most popular? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. What are the labels of this chart? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. What are the values of this chart? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Is this a frequency bar chart? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

More Chart Practice

1. Are apples more popular than grapes? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. How many categories of fruit are there? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. How many pears were sold? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. What fruit is least popular? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



1. Which expense needs the least amount of money? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Which expense takes up almost half of the budget? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Suppose a person has a $2000 monthly budget, and they spend 15% on food. How many dollars is spent on food in a single month? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

# **Unit 5**

Roll two dice, and guess the sum of the roll. Guess right and you win. Guess wrong and you lose.

*“What are your chances of winning?”*

I hypothesize…

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# Introducing Histograms

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| **First** | **Last** | **Height** |
| "John" | "Doe" | 52.0 |
| "Jane" | "Smith" | 49.1 |
| "Javon" | "Jackson" | 57.7 |
| "Angela" | "Enriquez" | 52.5 |
| "Jack" | "Thompson" | 53.0 |
| "Dominique" | "Rodriguez" | 51.1 |
| "Sammy" | "Carter" | 56.2 |
| "Andrea" | "Garcia" | 50.8 |

1. How many students are between 48 and 50 inches tall? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. How many students are between 50 and 52 inches tall? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. How many students are between 52 and 54 inches tall? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. How many students are between 54 and 56 inches tall? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. How many students are between 56 and 58 inches tall? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Add a bar to this histogram for students who are between 50 and 52 inches tall.

Histogram Practice

1. How many people were born between 1996 and 1997? \_\_\_\_\_\_\_\_\_\_\_
2. On what year were the most number of people born? \_\_\_\_\_\_\_\_\_\_\_
3. How many bins does this histogram have? \_\_\_\_\_\_\_\_\_\_\_\_
4. Were more people born in 1994 or 1995? \_\_\_\_\_\_\_\_\_\_\_\_



1. How many bins does this histogram have? \_\_\_\_\_\_\_\_\_\_\_\_
2. What is (are) the bins with the highest frequency of scores? \_\_\_\_\_\_\_\_\_\_\_\_
3. How many students scored between 85 and 92? \_\_\_\_\_\_\_\_\_\_\_\_

# **Unit 6**

*“Are more expensive restaurants generally*

*better than cheaper ones?”*

I hypothesize…

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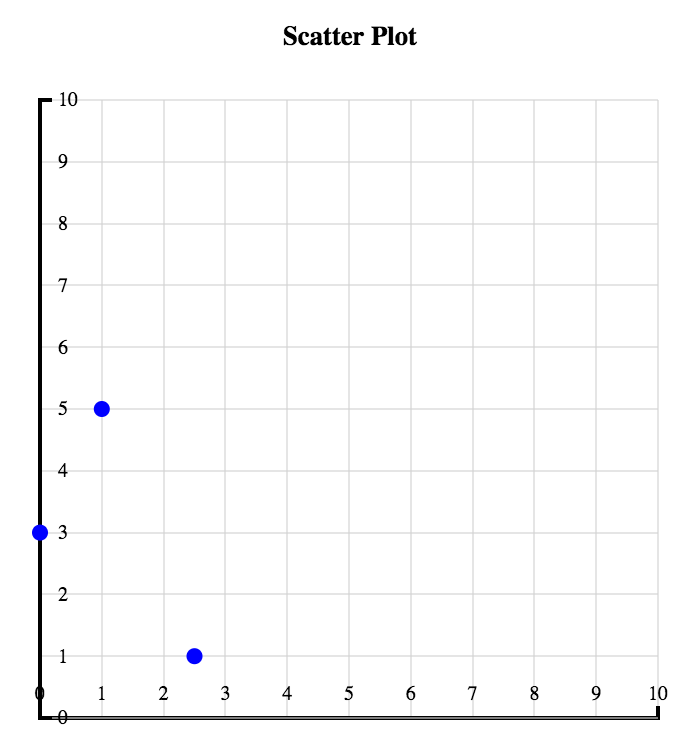
I found…

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# Creating a Scatter Plot

For each row in the following table, add a dot to the scatter plot. The first 3 rows have been completed for you. Use the values from the left column along the horizontal axis, and values from the right column along the vertical axis.

|  |  |
| --- | --- |
| 0 | 3 |
| 1 | 5 |
| 2.5 | 1 |
| 2 | 2 |
| 6 | 0 |
| 4 | 3 |



# Grading Predictor Functions

Below are the scatterplots for 4 data sets, with two different predictors shown for each set. For each data set**, circle the plot with the predictor function that fits better**, and **give it a grade between 0 (worst possible fit) and 1 (best possible fit).**

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | wb-pred-a-1.png | wb-pred-a-2.png | Grade for best predictor:  \_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 2 | wb-pred-b-2.png | wb-pred-b-1.png | Grade for best predictor:  \_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 3 | wb-pred-c-2.png | wb-pred-c-1.png | Grade for best predictor:  \_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 4 | wb-pred-d-2.png | wb-pred-d-1.png | Grade for best predictor:  \_\_\_\_\_\_\_\_\_\_\_\_\_ |

# Checking for Understanding

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1. In your own words, explain what a **predictor function** is.

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1. In your own words, explain what the **r-squared** value of a predictor is.

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# **Unit 7**

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# Practice with Select

Below is a table bound to the variable name animals.

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| --- | --- | --- | --- |
| **name** | **legs** | **eyes** | **lifespan** |
| "Human" | 2 | 2 | 71 |
| "Garden Ant" | 6 | 2 | 8 |
| "Spider" | 8 | 8 | 2.5 |
| "Bear" | 4 | 2 | 10 |

1. Draw the table produced by this code (don’t forget the header row!):

select lifespan, name from animals end

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| --- |
| **eyes** |
| 2 |
| 2 |
| 8 |
| 2 |

1. What code produces the table shown here?
2. *Challenge:* Draw the table produced by this code:

table1 = **select** name, legs **from** animals **end**

**select** legs **from** mystery **end**

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# Table Plan: Anything Unnecessary?

We can use tables to do all sorts of things – but we need a plan. Each of the following questions involves some subset of the animals table. Read each one carefully, then write a table query that will *remove unnecessary columns* –keeping only those we need – and binds the new table to a variable you choose.

**animals**

|  |  |  |  |
| --- | --- | --- | --- |
| **name** | **legs** | **eyes** | **lifespan** |
| "Human" | 2 | 2 | 71 |
| "Garden Ant" | 6 | 2 | 8 |
| "Spider" | 8 | 8 | 2.5 |
| "Bear" | 4 | 2 | 10 |

1. We want to make a table listing only the name and eyes columns

**Are any of the columns unnecessary?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ =

myTable-selected

**select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_

animals

**end**

1. We want to make a scatterplot of the relationship between legs and eyes.

**Are any of the columns unnecessary?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ =

**select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_

animals

**end**

1. We want to search for a connection between eyes and lifespan

**Are any of the columns unnecessary?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ =

**select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

# Table Plan: Is there an order?

We can use tables to do all sorts of things – but we need a plan. Each of the following questions involves the animals table. Read each one carefully, then write a table query that will *orders the rows of the table* –in the correct order – and binds the new table to a variable you choose.

**animals**

|  |  |  |  |
| --- | --- | --- | --- |
| **name** | **legs** | **eyes** | **lifespan** |
| "Human" | 2 | 2 | 71 |
| "Garden Ant" | 6 | 2 | 8 |
| "Spider" | 8 | 8 | 2.5 |
| "Bear" | 4 | 2 | 10 |

1. We want a table that has the shortest-lived animal first and longest-lived last.

**Do the rows need to be in some order?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ =

myTable-ordered

**select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_

animals

**end**

1. We want to extract a list of legs, from most-to-least.

**Do the rows need to be in some order?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ =

**select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_

animals

**end**

1. We want an alphabetized list of animal names.

**Do the rows need to be in some order?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ =

**select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

# What’s the Table Plan?

The table on the left (movies-start) is where we start. The table on the right (movies-end) is where we need to end up. Your job is to write the queries that get us there.

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| **movies-start**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Movie Title** | **Studio** | **Total Gross** | **Domestic** | **Overseas** | **Year** | | Interstellar | Par. | 675.1 | 188 | 487.1 | 2014 | | The Sixth Sense | BV | 672.8 | 293.5 | 379.3 | 1999 | | Man of Steel | WB | 668 | 291 | 377 | 2013 | | Kung Fu Panda 2 | P/DW | 665.7 | 165.2 | 500.4 | 2011 | | Ice Age: The  Meltdown | Fox | 660.9 | 195.3 | 465.6 | 2006 | | **movies-end**   |  |  |  | | --- | --- | --- | | **Movie Title** | **Total Gross** | **Domestic** | | Ice Age: The Meltdown | 660.9 | 188 | | Kung Fu Panda 2 | 665.7 | 293.5 | | Man of Steel | 668 | 291 | | The Sixth Sense | 672.8 | 165.2 | | Interstellar | 675.1 | 195.3 | |

**Do the rows need to be in some order?**

movies-ordered

movies-start

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **order** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Are any of the columns unnecessary?**

movies-end

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ =

**select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

# What’s the Table Plan?

The table on the left (movies-start) is where we start. The table on the right (movies-end) is where we need to end up. Your job is to write the queries that get us there.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **movies-start**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Movie Title** | **Studio** | **Total Gross** | **Domestic** | **Overseas** | **Year** | | Interstellar | Par. | 675.1 | 188 | 487.1 | 2014 | | The Sixth Sense | BV | 672.8 | 293.5 | 379.3 | 1999 | | Man of Steel | WB | 668 | 291 | 377 | 2013 | | Kung Fu Panda 2 | P/DW | 665.7 | 165.2 | 500.4 | 2011 | | Ice Age: The  Meltdown | Fox | 660.9 | 195.3 | 465.6 | 2006 | | **movies-end**   |  |  | | --- | --- | | **Title** | **Year** | | Interstellar | 2014 | | Man of Steel | 2013 | | Kung Fu Panda 2 | 2011 | | Ice Age: The Meltdown | 2006 | | The Sixth Sense | 1999 | |

**Do the rows need to be in some order?**

movies-ordered

movies-start

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **order** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Are any of the columns unnecessary?**

movies-end

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ =

**select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

# **Unit 8**

*“How much of Asia’s GDP does China generate?”*

I hypothesize…

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# Booleans and Comparison

Suppose your program has the following definitions:

legs = 2

eyes = 2

class = "Mammal"

continent = "North America"

What will each of the following expressions evaluate to?

|  |  |
| --- | --- |
| **Expression** | **Value** |
| legs <= 4 |  |
| eyes == 2 |  |
| legs <> 4 |  |
| eyes <> 5 - 3 |  |
| legs == eyes |  |

When you finish the first table try these challenge questions:

|  |  |
| --- | --- |
| **Expression** | **Value** |
| class == "Mammal" |  |
| class == "Invertebrate" |  |
| class <> "mammal" |  |
| continent == "Asia" |  |

# What’s the Table Plan?

The table on the left (movies-start) is where we start. The table on the right (movies-end) is where we need to end up. Your job is to write the queries that get us there.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **movies-start**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Movie Title** | **Studio** | **Total Gross** | **Domestic** | **Overseas** | **Year** | | Interstellar | Par. | 675.1 | 188 | 487.1 | 2014 | | The Sixth Sense | BV | 672.8 | 293.5 | 379.3 | 1999 | | Man of Steel | WB | 668 | 291 | 377 | 2013 | | Kung Fu Panda 2 | P/DW | 665.7 | 165.2 | 500.4 | 2011 | | Ice Age: The  Meltdown | Fox | 660.9 | 195.3 | 465.6 | 2006 | | **movies-end**   |  |  | | --- | --- | | **Title** | **Year** | | Interstellar | 2014 | | Man of Steel | 2013 | | Kung Fu Panda 2 | 2011 | |

**Do I need to get rid of any rows?**

movies-sieved

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **sieve** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do the rows need to be in some order?**

movies-ordered

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **order** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Are any of the columns unnecessary?**

movies-end

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ =

**select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

# What’s the Table Plan?

Starting with the table below, produce a table of Titles and Overseas profits, for all movies made before 2010, in ascending order of Total Gross. **Start by filling in what the end table should look like.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **movies-start**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Movie Title** | **Studio** | **Total Gross** | **Domestic** | **Overseas** | **Year** | | Interstellar | Par. | 675.1 | 188 | 487.1 | 2014 | | The Sixth Sense | BV | 672.8 | 293.5 | 379.3 | 1999 | | Man of Steel | WB | 668 | 291 | 377 | 2013 | | Kung Fu Panda 2 | P/DW | 665.7 | 165.2 | 500.4 | 2011 | | Ice Age: The Meltdown | Fox | 660.9 | 195.3 | 465.6 | 2006 | | **movies-end**   |  | | --- | |  | |  | |

**Do I need to get rid of any rows?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **sieve** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

movies-sieved

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do the rows need to be in some order?**

movies-ordered

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **order** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Are any of the columns unnecessary?**

movies-end

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ =

**select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

# Finding Bad Starter Tables

Four different data scientists create four different Starter Tables based on the presidents dataset. For each one, write down what makes it a bad starter table.

|  |  |
| --- | --- |
| **Starter Table** | **What’s wrong?** |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **nth** | **name** | **home-state** | **yr-started** | **yr-ended** | **party** | | 7 | Andrew Jackson | Tennessee | 1829 | 1837 | Democratic | |  |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **nth** | **name** | **home-state** | **yr-started** | **yr-ended** | **party** | | 7 | Andrew Jackson | Tennessee | 1829 | 1837 | Democratic | | 35 | John F. Kennedy | Massachusetts | 1961 | 1963 | Democratic | | 11 | James K. Polk | Tennessee | 1845 | 1849 | Democratic | | 44 | Barack Obama | Illinois | 2009 | 2017 | Democratic | |  |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **nth** | **name** | **home-state** | **yr-started** | **yr-ended** | **party** | | 18 | Ulysses S. Grant | Ohio | 1869 | 1877 | Republican | | 22 | Grover Cleveland | New York | 1885 | 1889 | Democratic | | 20 | James A. Garfield | Ohio | 1881 | 1881 | Republican | | 13 | Millard Fillmore | New York | 1850 | 1853 | Whig | |  |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **nth** | **name** | **home-state** | **yr-started** | **yr-ended** | **party** | | 45 | Donald Trump | New York | 2017 | 2021 | Republican | | 32 | Franklin D. Roosevelt | New York | 1933 | 1945 | Democratic | | 21 | Chester A. Arthur | New York | 1881 | 1885 | Republican | | 26 | Theodore Roosevelt | New York | 1901 | 1909 | Republican | |  |

# What’s the Table Plan?

Define a table showing the names and GDPs of all countries in Asia, starting with the countries table. ***Start out*** *by creating a realistic “start table”, using a sample of rows from the countries table, then a desired “end table” showing only the rows and columns you want, in the order you want them.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **countries**   |  | | --- | |  | |  | | **asian-GDPs**   |  | | --- | |  | |  | |

**Do I need to get rid of any rows?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **sieve** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do the rows need to be in some order?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **order** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Are any of the columns unnecessary?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ =

**select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

# **Unit 9**

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Extending Tables

Below is a table named containing the number of points scored by different NBA players in their first 3 games of a season. For each row, fill in the value of the **total-points** column, by adding the **game-1, game-2, game-3** columns together.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **player** | **game-1** | **game-2** | **game-3** | **total** |
| "Lebron James" | 30 | 28 | 36 |  |
| "Steph Curry" | 26 | 32 | 29 |  |
| "Kyrie Irving" | 21 | 24 | 27 |  |
| "John Wall" | 27 | 30 | 25 |  |
| "Isaiah Thomas" | 25 | 22 | 24 |  |

1. Which player has scored the most points so far? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Below is a table named **stores** containing the prices of packs of socks for several different stores. Each store sells different size packs, for different prices. For each row, fill in the values of the **price-per-sock**.

|  |  |  |  |
| --- | --- | --- | --- |
| **name** | **price** | **socks** | **price-per-sock** |
| "Super Store" | 2.50 | 4 |  |
| "Clothes Galore" | 5.40 | 4 |  |
| "Bargain Mart" | 4.50 | 6 |  |
| "Fashion Statement" | 15.00 | 12 |  |
| "Sock Emporium" | 7.00 | 10 |  |

1. Which store has the best deal on socks? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Table Plan: Countries

The United Nations wants us to find the top 5 countries in Asia, in terms of highest GDP per capita?

**Do I need to add a column?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **extend** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

-extended

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do I need to get rid of any rows?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **sieve** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

-sieved

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do the rows need to be in some order?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **order** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

-ordered

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Are any of the columns unnecessary?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ =

-selected

**select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

Table Plan: Nutrition

Your aunt is a bodybuilder, and wants to a healthy menu item. Healthy food is food with less than 80 grams of cholesterol. Starting with the nutrition table, what are the top 5 healthy menu items with the highest protein per gram?

**Do I need to add a column?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **extend** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

-extended

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do I need to get rid of any rows?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **sieve** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

-sieved

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do the rows need to be in some order?**

-ordered

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **order** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Are any of the columns unnecessary?**

-selected

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

Table Plan: Presidents

For how many years was each Democratic president in office? We’d like to make a histogram showing how many democratic presidents served between 0 - 4 years, or 4 - 8 years. How do we make the necessary table?

**Do I need to add a column?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **extend** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

-extended

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do I need to get rid of any rows?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **sieve** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

-sieved

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do the rows need to be in some order?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **order** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

-ordered

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Are any of the columns unnecessary?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ =

-selected

**select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

Rainfall Table Plan Practice

Given a table recording how much rain has fallen in a garden, make a scatter plot of how much rain fell in the first 99 days. Is the amount of rain per day increasing or decreasing? What’s the mean rainfall of the first 99 days?

**Do I need to add a column?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **extend** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

-extended

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do I need to get rid of any rows?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **sieve** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

-sieved

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do the rows need to be in some order?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **order** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

-ordered

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Are any of the columns unnecessary?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ =

-selected

**select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

Countries Table Plan Practice

Make a histogram of per-capita GDP for countries with universal health care. Do most of these countries have a per-capita GDP that is higher than the average per-capita GDP of all countries?

**Do I need to add a column?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **extend** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

-extended

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do I need to get rid of any rows?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **sieve** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

-sieved

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do the rows need to be in some order?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **order** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

-ordered

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Are any of the columns unnecessary?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ =

-selected

**select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

Table Plan

**Do I need to add a column?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **extend** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do I need to get rid of any rows?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **sieve** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do the rows need to be in some order?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **order** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Are any of the columns unnecessary?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ =

**select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

Table Plan

**Do I need to add a column?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **extend** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do I need to get rid of any rows?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **sieve** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do the rows need to be in some order?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **order** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Are any of the columns unnecessary?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ =

**select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

Table Plan

**Do I need to add a column?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **extend** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do I need to get rid of any rows?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **sieve** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **using** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Do the rows need to be in some order?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = **order** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

**Are any of the columns unnecessary?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ =

**select** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **from** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**end**

Contracts

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Domain** | **Range** | **Example** |
| num-max |  |  | num-max(-1, 3) |
| string-length |  |  | string-length("pyret") |
| string-repeat | String Number | String |  |
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1. https://web.archive.org/web/20060903121944/http://www.census.gov/hhes/income/histinc/h13.html [↑](#footnote-ref-1)