I Have a Dataset! Now What?

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Session Goal

In this session, you will learn to use four questions to evaluate and understand a dataset:

- What is the integrity of the dataset?
- What type of data does the dataset contain?
- What can the data tell me?
- What techniques can I use to analyze the data?

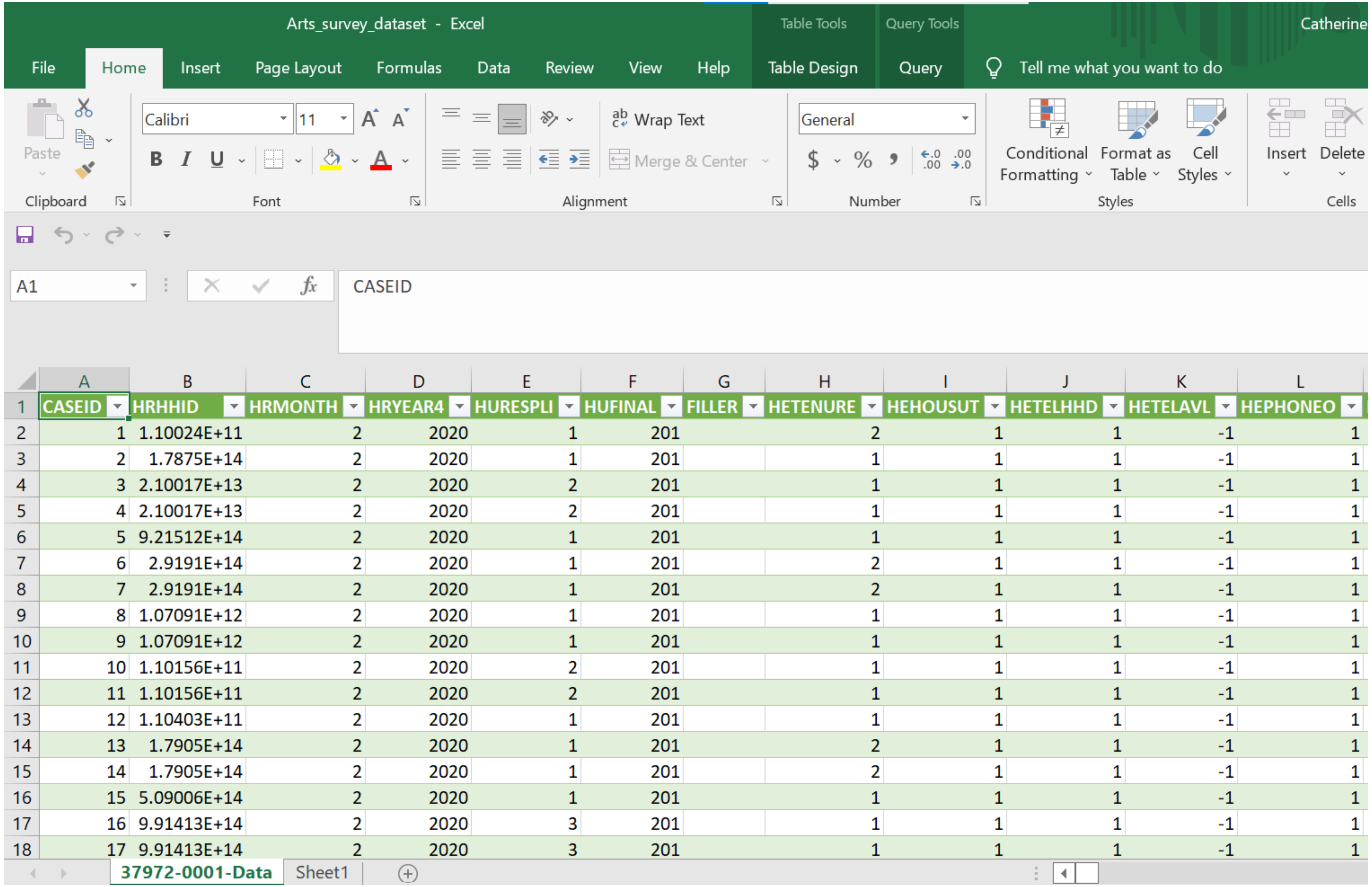
To Begin: A Few Terms

- Data: pieces of information
- Variable: factor of interest that can vary
    - Examples: age; temperature; test score; extent of agreement
- Value: score, code, or other content that represents position on the variable
    - Examples: 46 years old; 50 degrees Fahrenheit; 85%; Strongly disagree

Dataset Example

- 2020 Arts Basic Survey – U.S. Bureau of the Census for the National Endowment for the Arts
  - Source: National Endowment for the Arts, United States. Bureau of the Census, and United States. Bureau of Labor Statistics. Arts Basic Survey, United States, 2020. Inter-university Consortium for Political and Social Research [distributor], 2021-05-03. https://doi.org/10.3886/ICPSR37972.v1
- Conducted in February, 2020
- Approximately 35,000 survey respondents; half responded to the arts questions
- Exporting and importing data – see video link in chat!

Sample dataset

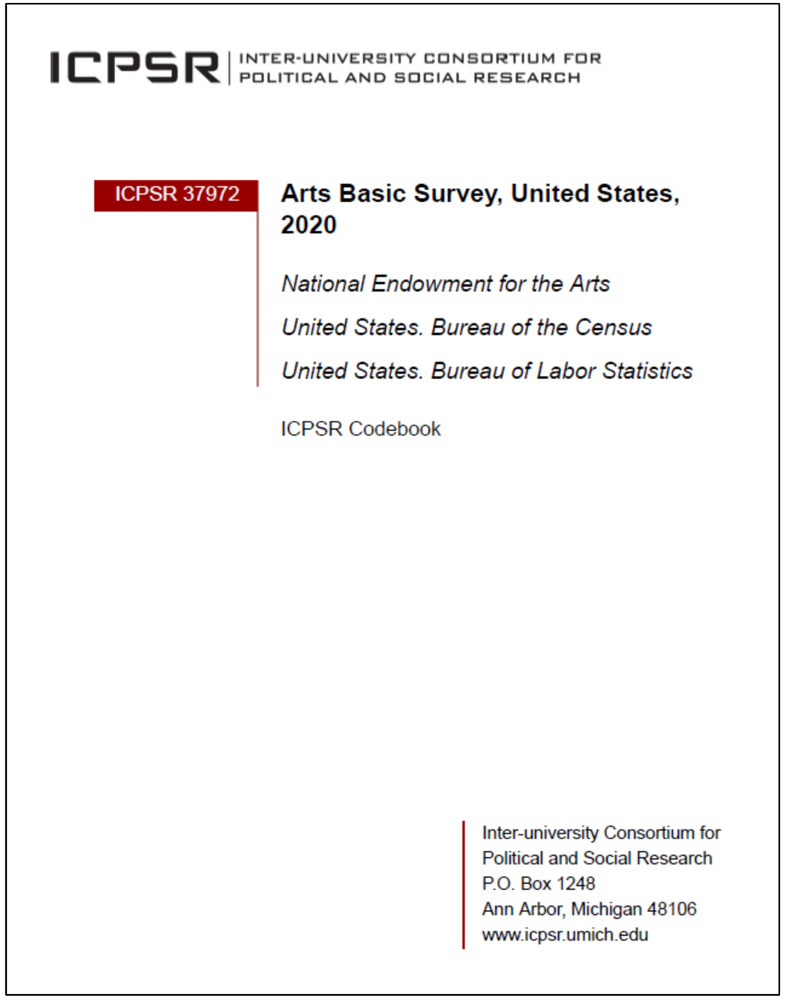


A1 CASEID

CASEID	HRHHID	HRMONTH	HRYEAR4	HURESPLI	HUFINAL	FILLER	HETENURE	HEHOUSUT	HETELHHD	HETELAVL	HEPHONEO
1	1.10024E+11	2	2020	1	201		2	1	1	-1	1
2	1.7875E+14	2	2020	1	201		1	1	1	-1	1
3	2.10017E+13	2	2020	2	201		1	1	1	-1	1
4	2.10017E+13	2	2020	2	201		1	1	1	-1	1
5	9.21512E+14	2	2020	1	201		1	1	1	-1	1
6	2.9191E+14	2	2020	1	201		2	1	1	-1	1
7	2.9191E+14	2	2020	1	201		2	1	1	-1	1
8	1.07091E+12	2	2020	1	201		1	1	1	-1	1
9	1.07091E+12	2	2020	1	201		1	1	1	-1	1
10	1.10156E+11	2	2020	2	201		1	1	1	-1	1
11	1.10156E+11	2	2020	2	201		1	1	1	-1	1
12	1.10403E+11	2	2020	1	201		1	1	1	-1	1
13	1.7905E+14	2	2020	1	201		2	1	1	-1	1
14	1.7905E+14	2	2020	1	201		2	1	1	-1	1
15	5.09006E+14	2	2020	1	201		1	1	1	-1	1
16	9.91413E+14	2	2020	3	201		1	1	1	-1	1
17	9.91413E+14	2	2020	3	201		1	1	1	-1	1

Question 1: What is the integrity of the dataset?

- Source
- Sample
- Method of data collection
- Reliability and validity of measures



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ICPSR 37972

Arts Basic Survey, United States, 2020

National Endowment for the Arts

United States. Bureau of the Census

United States. Bureau of Labor Statistics

ICPSR Codebook

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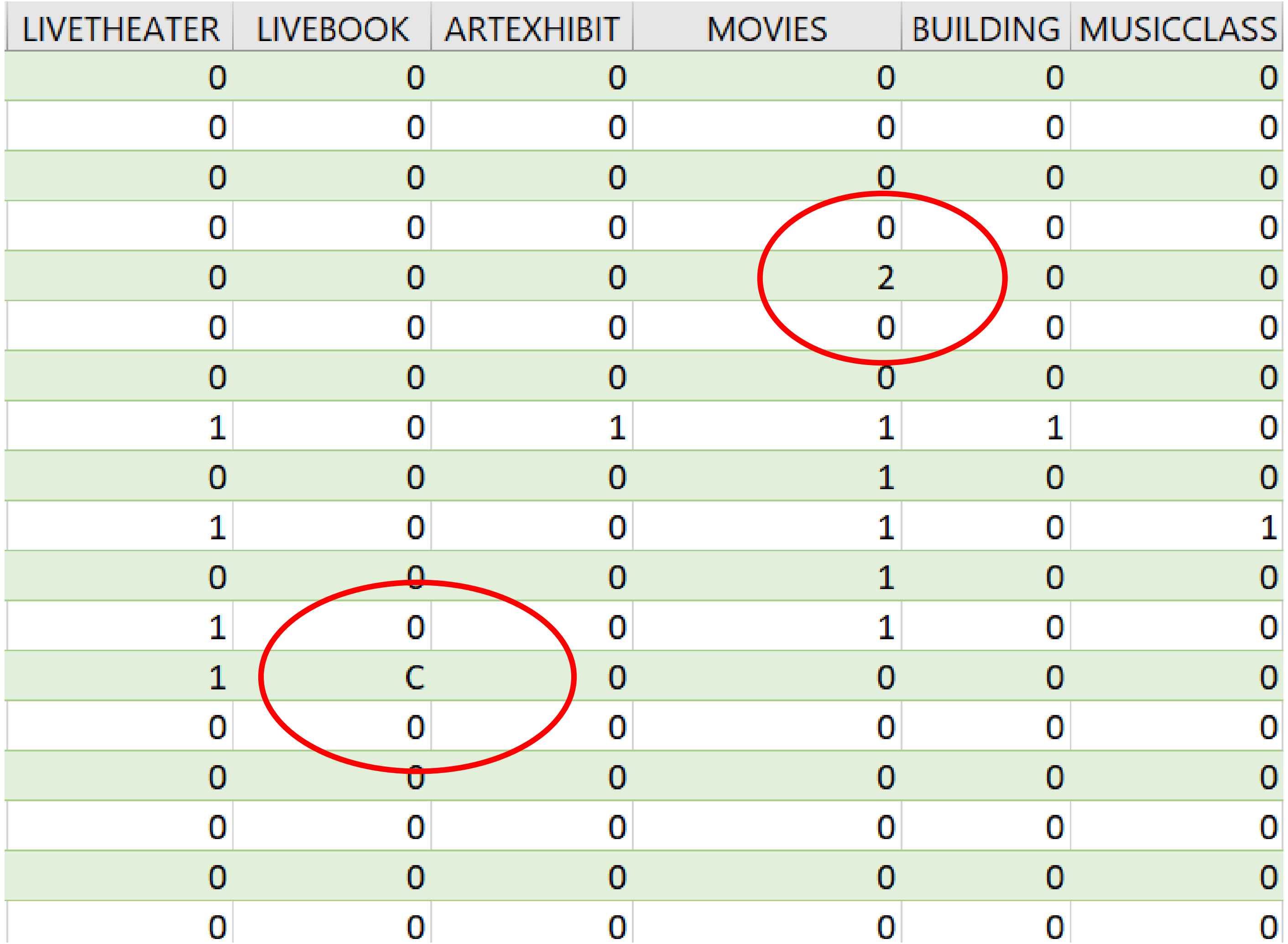
Missing Data and Cleaning the Dataset

Why are data missing? Is there a pattern?

How much cleaning is needed?

- Errors, blank rows, duplicates, outliers
- Formatting

Cleaning the Dataset

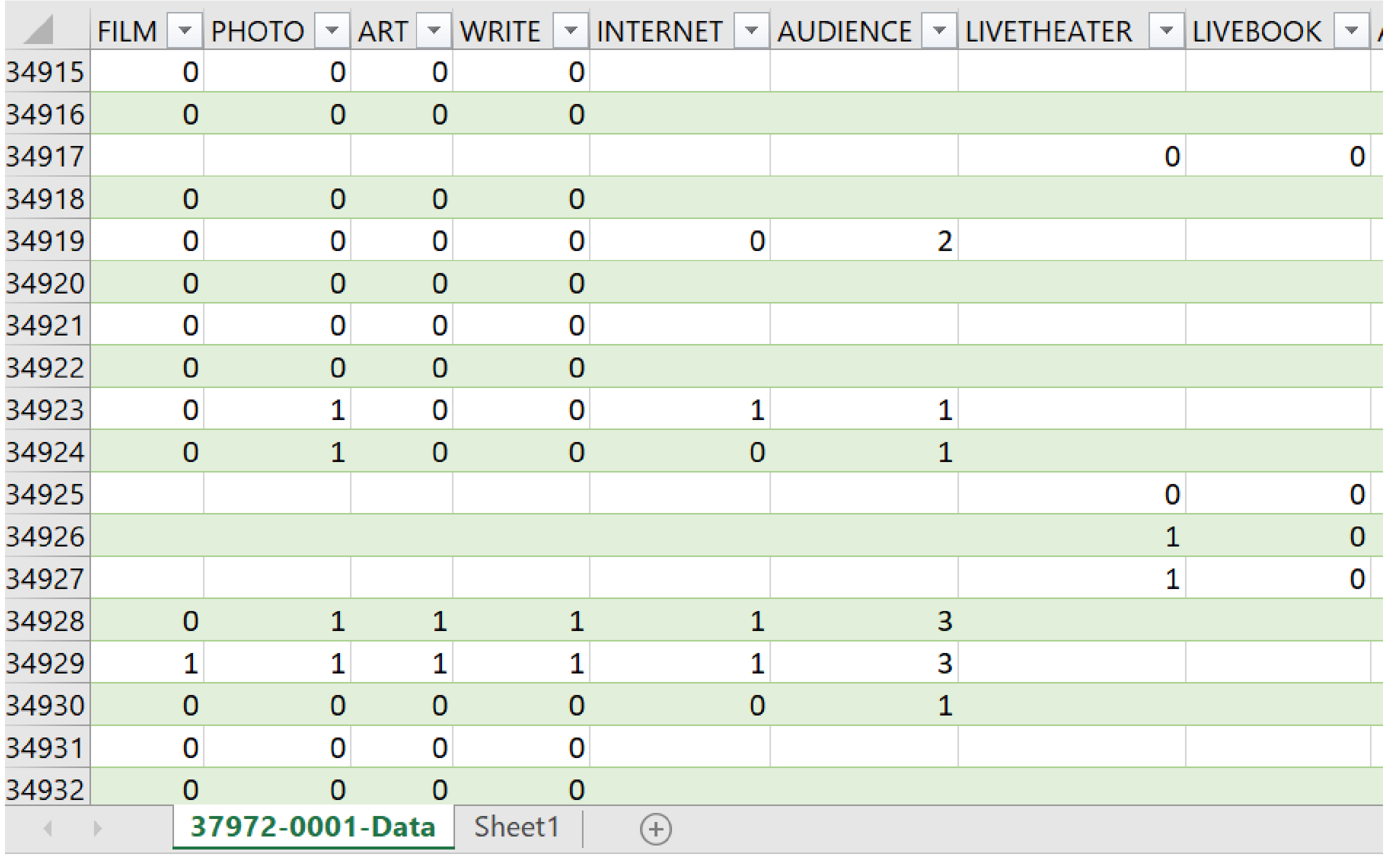


LIVETHEATER	LIVEBOOK	ARTEXHIBIT	MOVIES	BUILDING	MUSICCLASS
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	2	0	0
0	0	0	0	0	0
0	0	0	0	0	0
1	0	1	1	1	0
0	0	0	1	0	0
1	0	0	1	0	1
0	0	0	1	0	0
1	0	0	1	0	0
1	C	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0

Question 2: What type of data does the dataset contain?

- Qualitative – text/visual
- Quantitative – numeric
- Mixed – both

Quantitative Data



	FILM	PHOTO	ART	WRITE	INTERNET	AUDIENCE	LIVETHEATER	LIVEBOOK
34915	0	0	0	0				
34916	0	0	0	0				
34917							0	0
34918	0	0	0	0				
34919	0	0	0	0	0	2		
34920	0	0	0	0				
34921	0	0	0	0				
34922	0	0	0	0				
34923	0	1	0	0	1	1		
34924	0	1	0	0	0	1		
34925							0	0
34926							1	0
34927							1	0
34928	0	1	1	1	1	3		
34929	1	1	1	1	1	3		
34930	0	0	0	0	0	1		
34931	0	0	0	0				
34932	0	0	0	0				

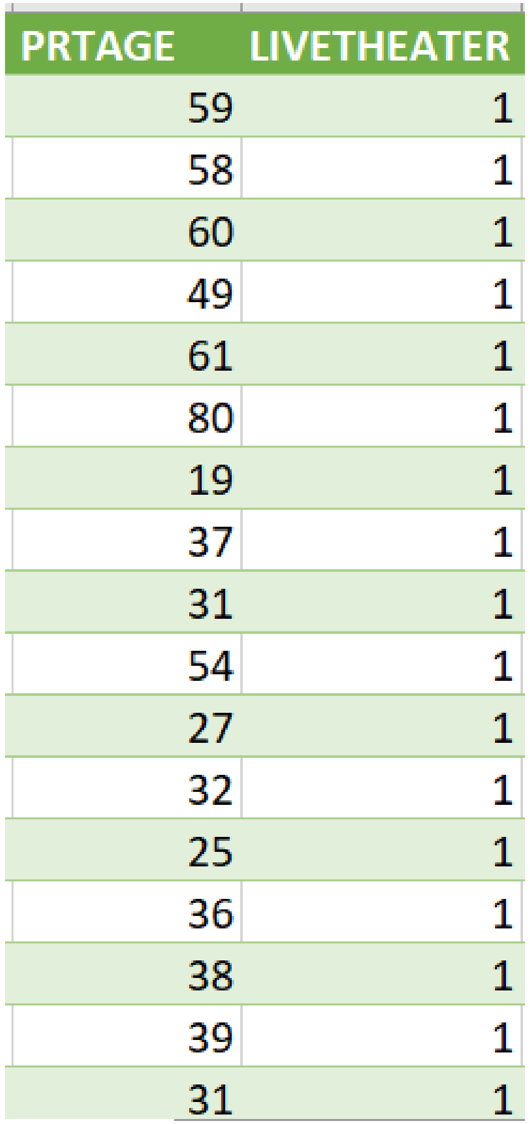
- Categorical variables: dichotomies or discrete groups
- Continuous variables: measurable

Question 3: What can the data tell me?

Qualitative: experiences, stories, themes

Quantitative:

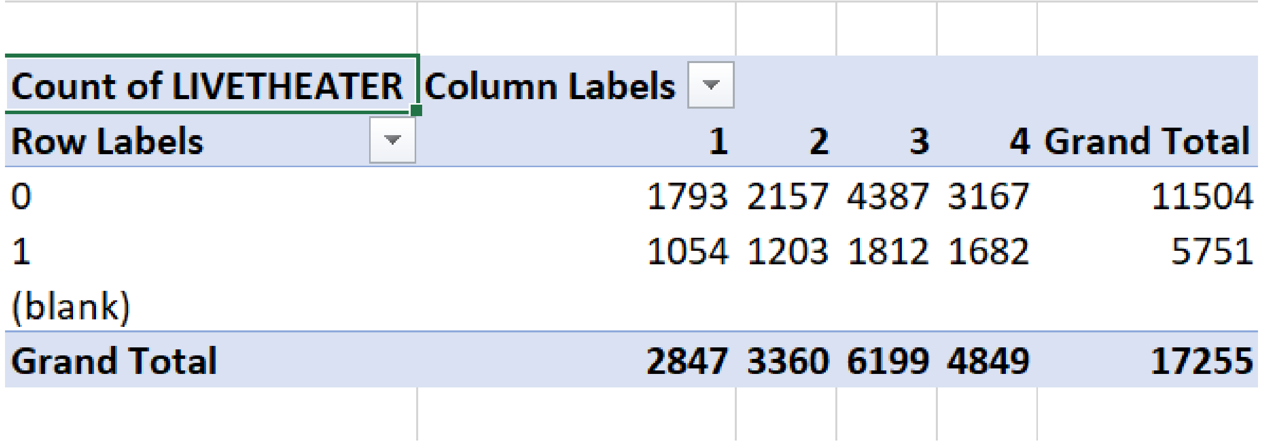
- Central tendency and variability (see image)
- Frequency/percentage
- Relationship



PRTAGE	LIVETHEATER
59	1
58	1
60	1
49	1
61	1
80	1
19	1
37	1
31	1
54	1
27	1
32	1
25	1
36	1
38	1
39	1
31	1

Question 4: What techniques can I use to analyze the data?

- Qualitative: coding, thematic analysis
- Quantitative:
  - Data visualization
  - Descriptive statistics
  - Inferential statistics



Count of LIVETHEATER	Column Labels				
Row Labels	1	2	3	4	Grand Total
0	1793	2157	4387	3167	11504
1	1054	1203	1812	1682	5751
(blank)					
Grand Total	**2847**	**3360**	**6199**	**4849**	**17255**

Quiz!

- Type your responses in the chat, but wait to post your response!
  - Evaluating a dataset begins with examining what aspect?
  - What are two main types of quantitative variables?
  - **True or False:** With qualitative data, research questions focus on frequency, central tendency, and comparison and relationship.
  - What is typically the first step in analyzing quantitative data?

Quiz Answers

- Evaluating a dataset begins with examining what aspect?
  - The integrity of the dataset
- What are two main types of quantitative variables?
  - Categorical and continuous
- True or False: With qualitative data, research questions focus on frequency, central tendency, and relationship.
  - False: This is true of quantitative data.
- What is typically the first step in analyzing quantitative data?
  - Data visualization

Wrap-up and Q&A

Four questions for understanding and evaluating a dataset:

- What is the integrity of the dataset?
- What type of data does the dataset contain?
- What can the data tell me?
- What techniques can I use to analyze the data?

Questions?

Thank you!