

Attribute Data

These questions will require you to use the skills and information you learned in chapter 7, the tutorial, and the associated lectures.

This exercise will further your familiarity with attribute data in ArcGIS Pro.

Items to keep in mind:

- 1) Create a new project before beginning the exercise.
- 2) General location of data files will be provided (see below). You will have to determine exactly which file to use, but the folders you should be working with are identified.
- 3) Any questions requiring the acquisition of data online will be your responsibility to find the data and download it.
- 4) Any new tasks required will be described. Otherwise, the tools and techniques required to answer the questions will have been introduced in the tutorials for this lab and any prior labs.

To answer the questions, you will need to use the data in the following folders:

mgisdata\Usa

Reading Questions

Question 1: Choose the best field type (i.e., short, float, etc.) for each of the following types of data in a geodatabase:

Populations of countries in the World: **Long**

Average precipitation in inches: **Float**

Number of counties in a state: **Short**

Highway name: **Text**

Distances between US cities, in meters: **Double**

Birthdays: **Date**

Question 2: What is the cardinality (ie., one-to-many, etc.) of each of the following relationships? (**HINT:** remember that the target table is the left term (in the above case, “one”) and the join table is the right term).

Students to college classes: **many-to-many**

States to governors: **one-to-one**

Students to grades: **one to many** (if each student gets unique grades in different subjects)

many to many (if multiple students get same marks in different subjects)

Counties to states: **many-to-one**

***Use the *store_openings.csv* file in the Usa folder to answer the following questions:

HINT: Remember to put the file into an ArcGIS format first

HINT: Remember to check the format of the fields before changing to ArcGIS format.

Question 3:

- a) What stores (Brand) are listed in the table?
Supercenter
Wal-Mart
- b) How many stores are there?
Total- 3176
Supercenter- 1980
Wal-Mart- 1196
- c) Where (location), and when (date) did the first store open?
2110 WEST WALNUT, Rogers, AR
7/1/1962
- d) Where (location) and when (date) did the most recent store open?
25737 US Rte 11, Evans Mills, NY
1/31/2006
- e) Is the latest opening listed actually the newest store in the US? How can you tell from the data?
No. After analyzing the metadata, we can conclude that the data in the table is the list of opening dates for Walmart stores and Supercenters, between 1962 and 2006, excluding Alaska and Hawaii. That means the data after 2006 is missing here. Also, as the data for Alaska and Hawaii is not included here, any store can be opened recently there.

Question 4: Create a table that lists each state and the number of stores per state (need to calculate).

HINT: Ultimately, we want to be able to map the data

- a) Which state has the most stores (and how many)?
TX
315
- b) Which state has the least stores (and how many)?
VT
4
- c) Sort the states by name. Take a screen **capture** of the table (showing at least 20 states) and insert here. Make sure that the state names and the number of stores per state fields are visible.

STRSTATE ▲	FREQUENCY
AL	90
AR	81
AZ	57
CA	159
CO	57
CT	32
DE	8
FL	176
GA	116
IA	55
ID	17
IL	130
IN	88
KS	53
KY	81
LA	83
MA	44
MD	41
ME	22
MI	77
MN	52
MO	117

Figure 1: Number of Stores by State

Question 5: Determine the number of stores per 100,000 people in each state (using the POP2014 data). **HINT:** Save as a new table before using the Calculate Field tool.

- a) Which state has the most stores per capita (and how many)?

AR

2.70421

- b) Which state has the least stores per capita (and how many)?

CA

0.417103

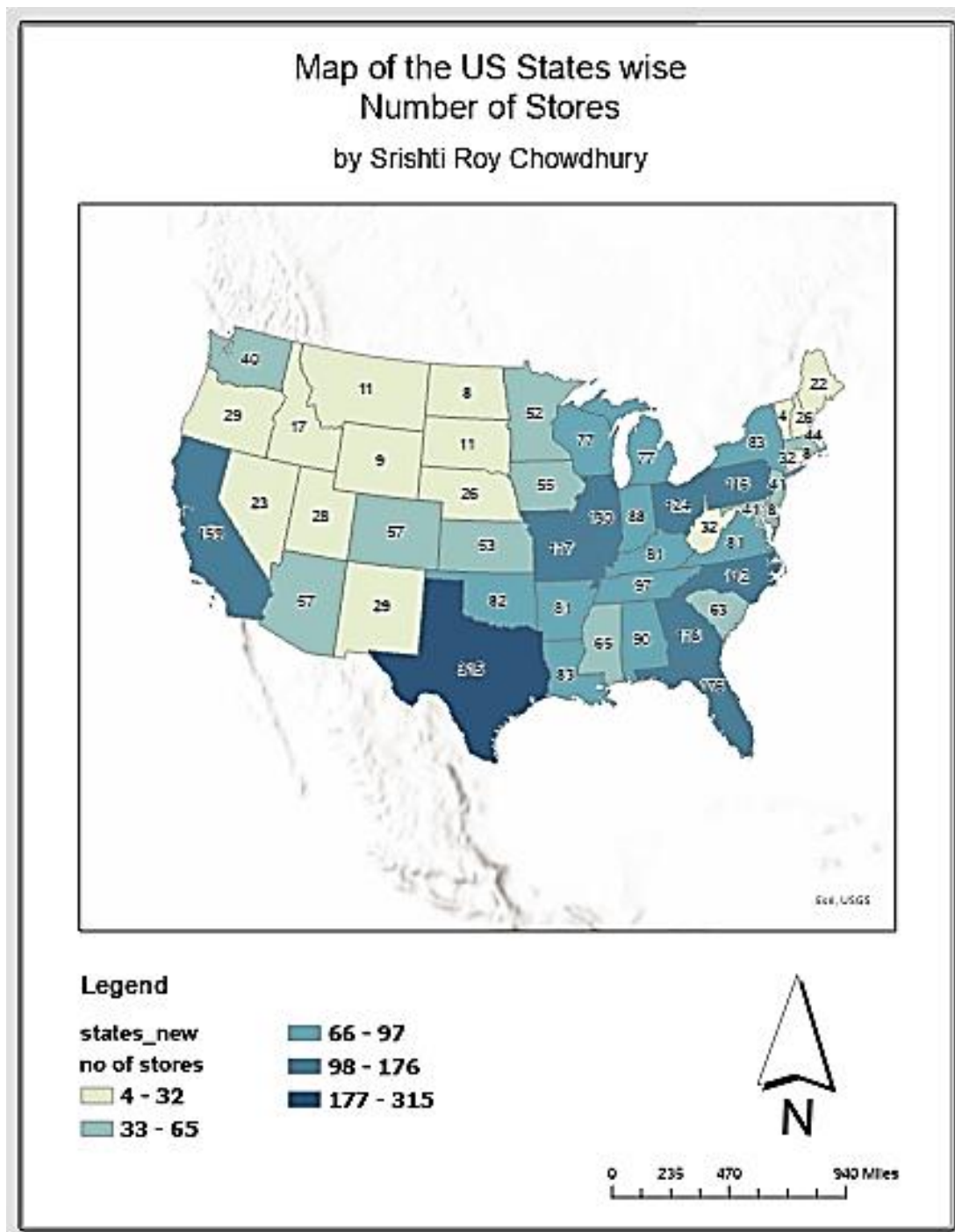
- c) Sort the states by name. Take a screen **capture** of the table (Showing at least 20 states) and insert here. Make sure that the state names and stores per capita fields are visible.

STRSTATE ▲	FREQUENCY	COUNT_STRSTATE	POP2014	Storepercapita
AL	90	90	4885854	1.842053
AR	81	81	2995330	2.70421
AZ	57	57	6636256	0.858918
CA	159	159	38120066	0.417103
CO	57	57	5235100	1.088804
CT	32	32	3601157	0.888603
DE	8	8	927030	0.862971
FL	176	176	19383475	0.90799
GA	116	116	9978939	1.162448
IA	55	55	3111844	1.767441
ID	17	17	1628760	1.043739
IL	130	130	12914651	1.006609
IN	88	88	6581982	1.336983
KS	53	53	2908933	1.821974
KY	81	81	4419036	1.832979
LA	83	83	4681639	1.772883
MA	44	44	6656872	0.660971
MD	41	41	5903286	0.694528
ME	22	22	1345609	1.634947
MI	77	77	9853722	0.781431
MN	52	52	5401748	0.962651
MO	117	117	6074504	1.926083

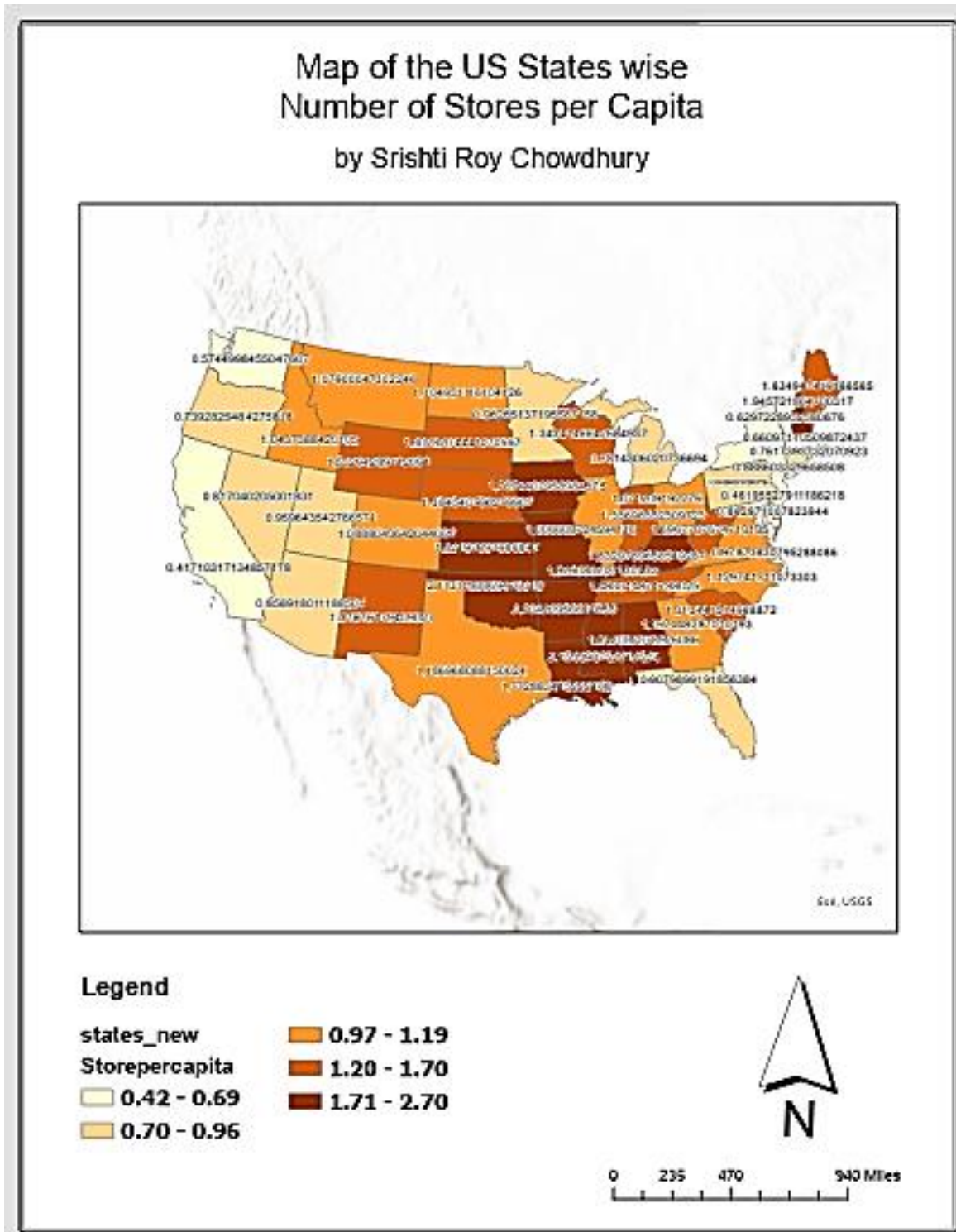
Figure 2: State wise per capita number of state

Question 6: Create 2 maps:

- a) One showing the number of stores in each state.



b) One showing the number of stores per capita (per 100,000) in each state.



Question 7: Create a chart (scatterplot) to view the relationship between the number of stores in a state and the 2014 population.

- a) How good of a relationship is there between the variables?

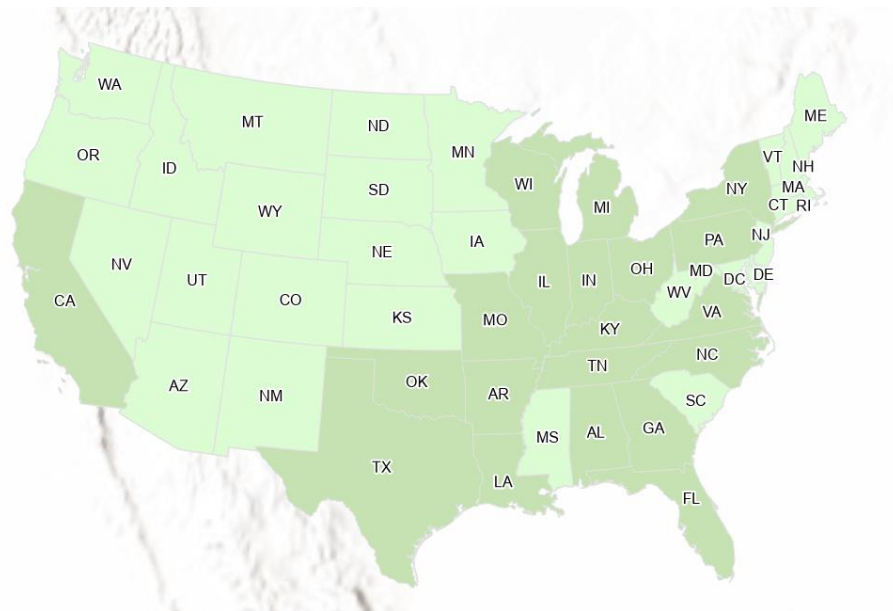
From the chart, we can see that the value of r square is 0.63 which represents a moderate relation between the variables

- b) Which state(s) has a higher than average number of stores?

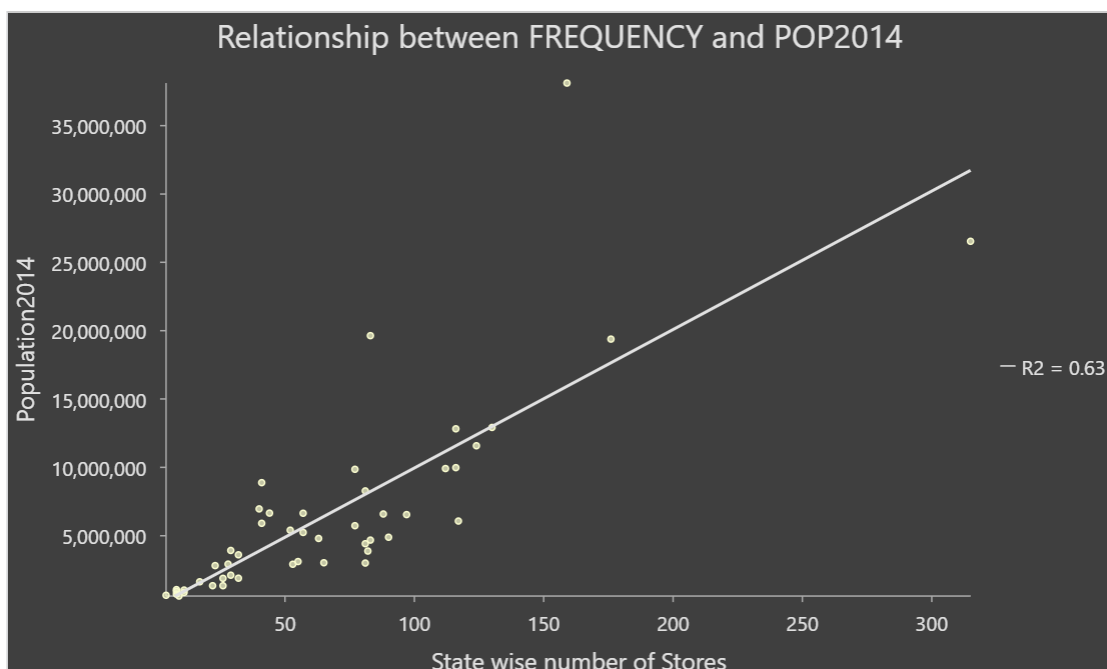
- c) Which state(s) has a lower than average number of stores?

The darker green states represent the states with the number of stores above average. There are a total of 20 states above the average.

The rest of the states have stores below average number of stores.



- d) Capture the chart and insert here:



Question 8: Create a table that contains the earliest and average opening date of stores for EACH state.

- a) Which state has the latest average opening date?



CT

7/10/1999 9:00:00 AM

- b) What is the average opening date for all of the stores in the country?

9/1/1991 1:17:05 AM

- c) Sort the table by State name. **Capture** the table (with state names, minimum (earliest) and average opening dates visible) and insert here.

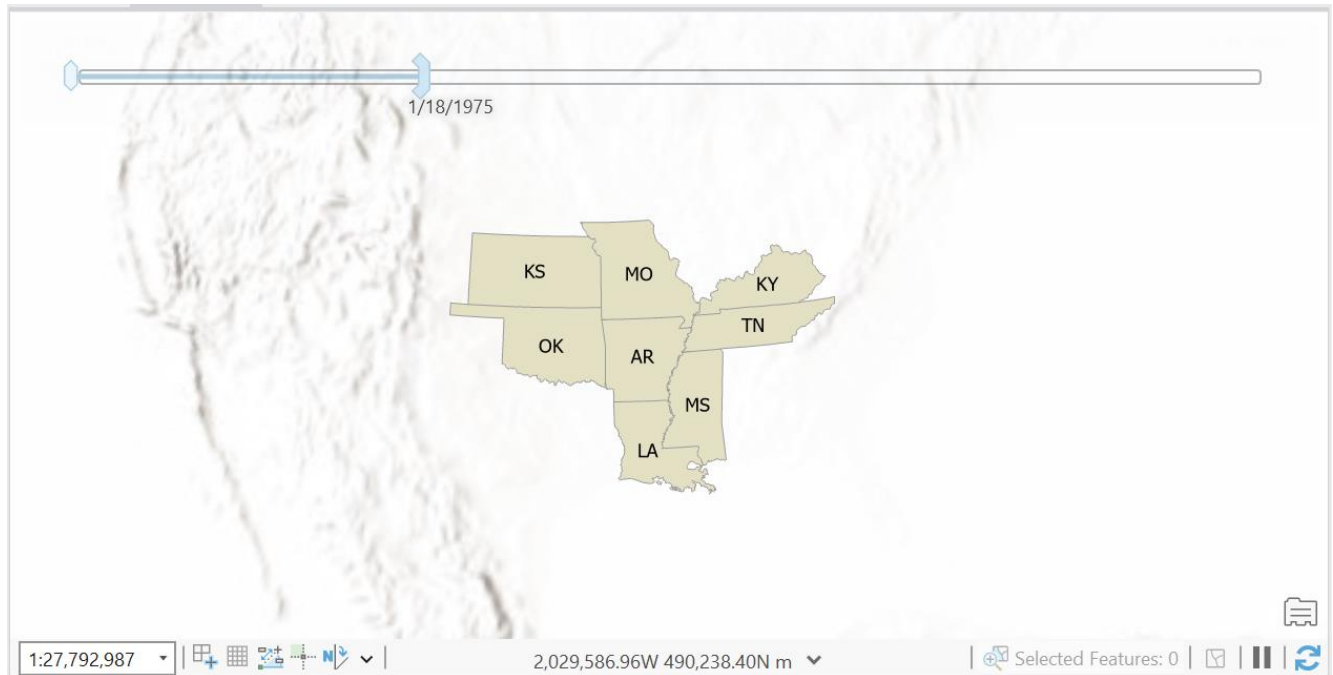
Selection:  Rows:  v				
STRSTATE	FREQUENCY	MEAN_OPENDATE	MIN_OPENDATE	
AL	90	3/29/1987 8:48:00 AM	11/27/1979	
AR	81	1/30/1979 4:44:27 AM	7/1/1962	
AZ	57	4/13/1996 11:09:28 PM	5/3/1988	
CA	159	1/2/1997 4:36:14 PM	8/1/1990	
CO	57	2/15/1994 12:25:16 AM	10/1/1985	
CT	32	7/10/1999 9:00:00 AM	1/5/1993	
DE	8	12/29/1998 3:00:00 PM	11/5/1991	
FL	176	11/5/1991 9:49:05 PM	11/16/1982	
GA	116	1/18/1991 5:35:10 AM	7/4/1981	
IA	55	2/1/1991 8:17:27 AM	7/1/1983	
ID	17	7/30/1997 4:14:07 AM	11/2/1992	
IL	130	1/7/1990 6:27:42 AM	7/1/1977	
IN	88	11/16/1991 6:00:00 PM	10/18/1983	
KS	53	7/30/1985 8:49:49 PM	11/1/1970	
KY	81	9/12/1987 10:48:53 PM	8/1/1974	
LA	83	2/6/1986 3:36:52 PM	11/1/1970	
MA	44	5/1/1997 7:05:27 PM	9/1/1992	
MD	41	8/6/1997 3:13:10 PM	11/5/1991	

Question 9: Read the Help Section under *Help > Maps and Scenes > Time > Visualize time in a map > Visualize temporal data using the time slider and learn how to set up and operate the time properties and slider. Use it to examine the spread of stores over time based on the earliest opening date in each state.*

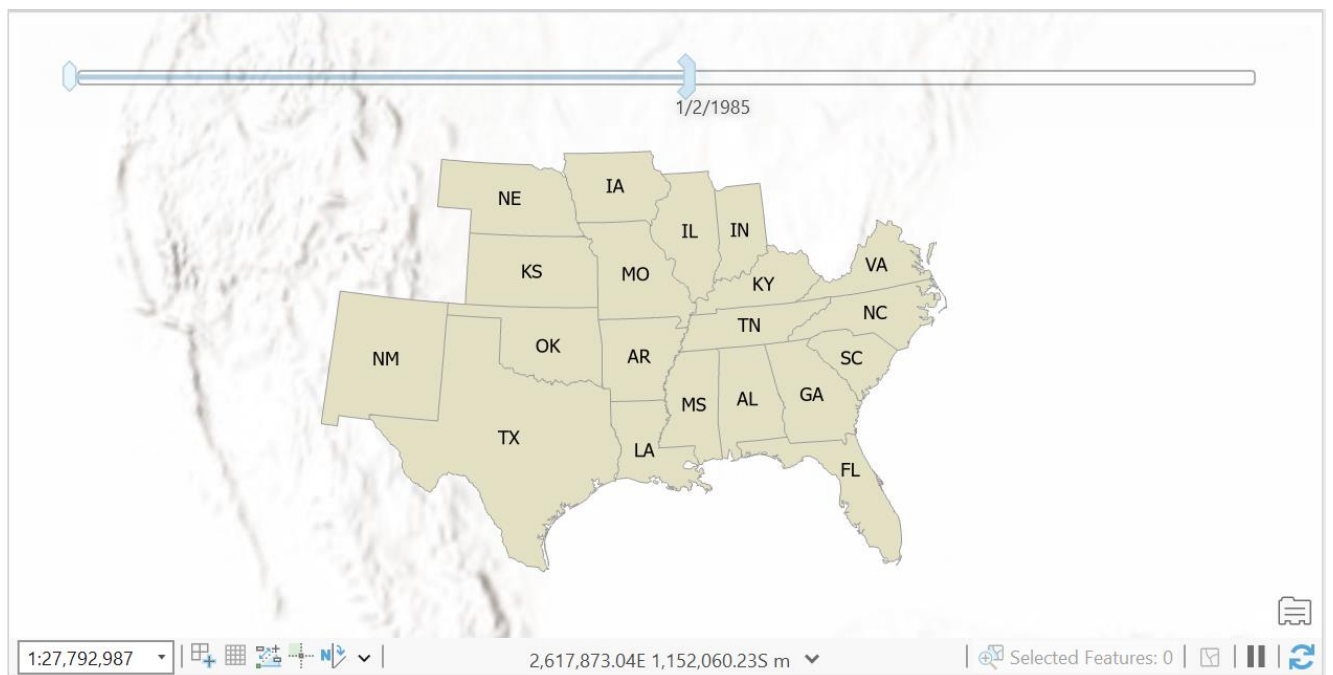
NOTE: See Time Slider attachment for directions.

HINT: You need to have the time data (Store opening dates associated with the state features)

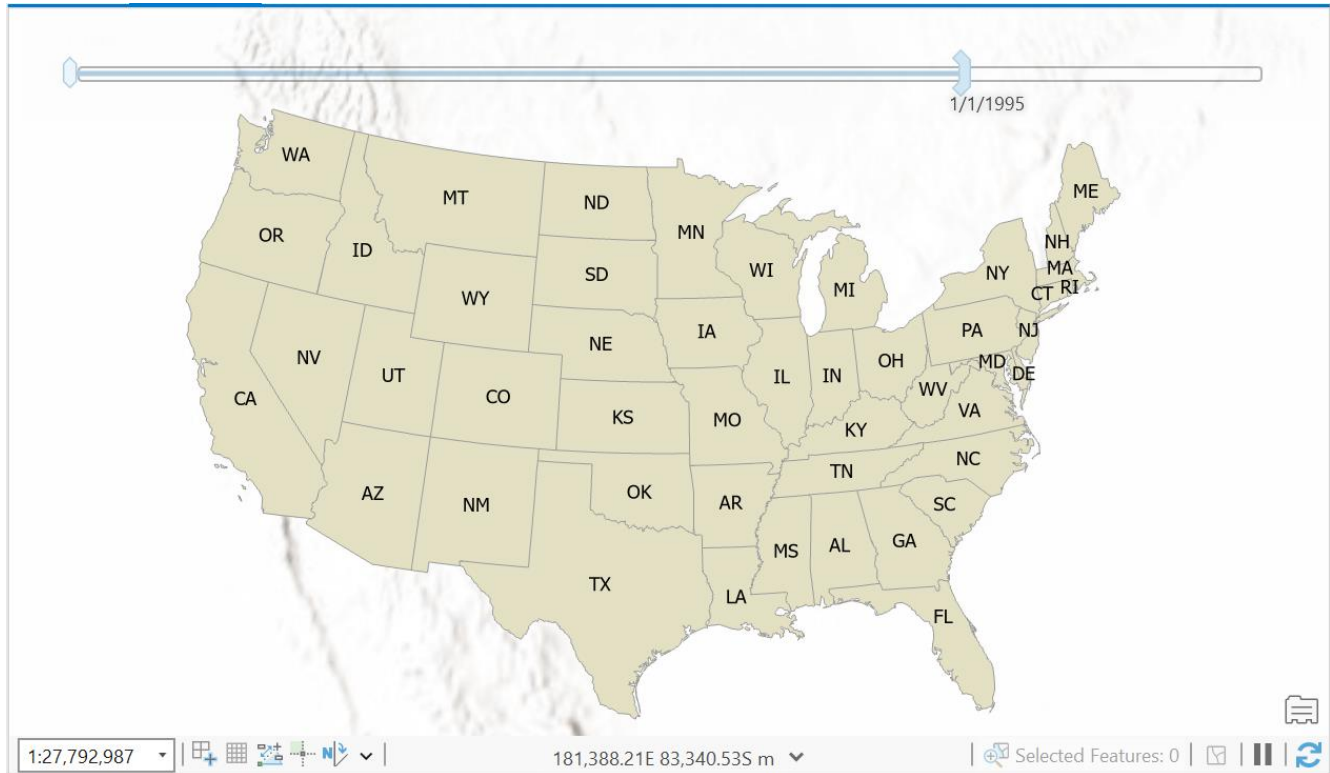
a) **Capture** the map showing which states had a store by the beginning of 1975 and insert here.



b) **Capture** the map showing which states had a store by the beginning of 1985 and insert here.



c) **Capture** the map showing which states had a store by the beginning of 1995 and insert here.



d) Briefly describe the pattern of store openings.

The stores began opening from the center of the United States, with the first store launched in Arkansas (AR), located in the southern part of the country. From there, the stores spread outward to both the east and west. By early 1995, they had expanded to nearly every state. The last state to receive a store was Vermont (VT).

Question 10: Find a table on the internet with x-y coordinates or a field that allows it to be joined to a spatial data set (eg. Counties, states, etc). Format the table so it can be read by ArcGIS and create a map showing the data.

- a) **Capture** the joined table showing some of the Target and Joined data (you can rearrange fields or make invisible excess fields). Insert here.

states_new3								
Field: Add Calculate Selection: Select By Attributes Zoom To Switch Clear Delete Copy								
	SUB_REGION	STATE_ABBR	POP2014	SQMI	STRSTATE	Place_Name	Latitude	Longitude
1	Pacific	WA	6962578	67620.68	WA	Mount Rainier Nationa...	46.879967	-121.726906
2	Mountain	ID	1628760	83570.14	ID	<Null>	<Null>	<Null>
3	Pacific	OR	3922722	97076.81	OR	Siuslaw National Forest...	44.358715	-123.829994
4	Mountain	NV	2815039	110561.37	NV	Sand Harbor State Park...	39.198364	-119.930984
5	Pacific	CA	38120066	158144.83	CA	Pinnacles National Par...	36.491508	-121.197243
6	Mountain	MT	1019462	147042.71	MT	<Null>	<Null>	<Null>
7	West North Central	ND	724027	70700.02	ND	Turtle Mountain, ND,...	48.852882	-99.803535
8	West North Central	SD	844322	77116.22	SD	Bear Butte State Park,...	44.475296	-103.424309
9	Mountain	WY	587106	97813.89	WY	Grand Teton National...	43.790802	-110.684944
10	West North Central	MN	5401748	84376.21	MN	Maplewood State Park,...	46.520966	-95.951576
11	West North Central	IA	3111844	56272.82	IA	<Null>	<Null>	<Null>
12	West North Central	NE	1877879	77353.01	NE	<Null>	<Null>	<Null>
13	Mountain	UT	2917750	84898.13	UT	Capitol Reef National P...	38.0896	-111.14991
14	Mountain	CO	5235100	104093.95	CO	Rocky Mountain Natio...	40.343182	-105.688103
15	West North Central	KS	2908933	82277.97	KS	<Null>	<Null>	<Null>
16	West North Central	MO	6074504	69702.89	MO	Danville Conservation...	38.865097	-91.504852
17	Mountain	AZ	6636256	113997.77	AZ	Grand Canyon Nationa...	36.266033	-112.363808
18	West South Central	OK	3880520	69900.14	OK	<Null>	<Null>	<Null>

0 of 51 selected Filters: 100%

b) **Capture** the map showing the data. Be sure to include the contents pane with the symbology visible. Insert here.

