Software Requirement Specification: SAC Prediction Time Series

USA Education Department

Created By: **Anubhav Oberoy**
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User Persona:

Roger Morrison is **Data scientist** working with Anubhav Trainings. he is a data scientist specialized in working with education industry and social status of under-privileged children. He works with federal government with various projects like Education rights for everyone, learn to become expert and more…

He helps the governments of USA and Canada, scrutinizing the financials of the educational institutions and helps governments to plan their education expenditure and budget. With over 32 years of domain experience, he is holding precious awards as one of the best government advisor for risk/budget planning on education sector.

The Business Story

The United States Census Bureau conducts annual surveys to assess the finances of elementary and high schools and data set contain a summary of revenue and expenditure for the years 1992-2016, organized by state.

Roger will review and analyze the revenue and expenditures of the past years and explore both expenditure and revenues across all 50 states using smart discovery features and forecast for the next few periods. During exploration you will find that the revenue and expenditure patterns are different for each state and one model cannot work well for all the state.

To improve the forecasting accuracy, it is necessary to model each state separately and requires 50 models as we have 50 states. Normally modeling 50 states separately is a tedious work. But SAC segmentation feature helps us to accomplish this easily and then consume forecasting results into our analytics.

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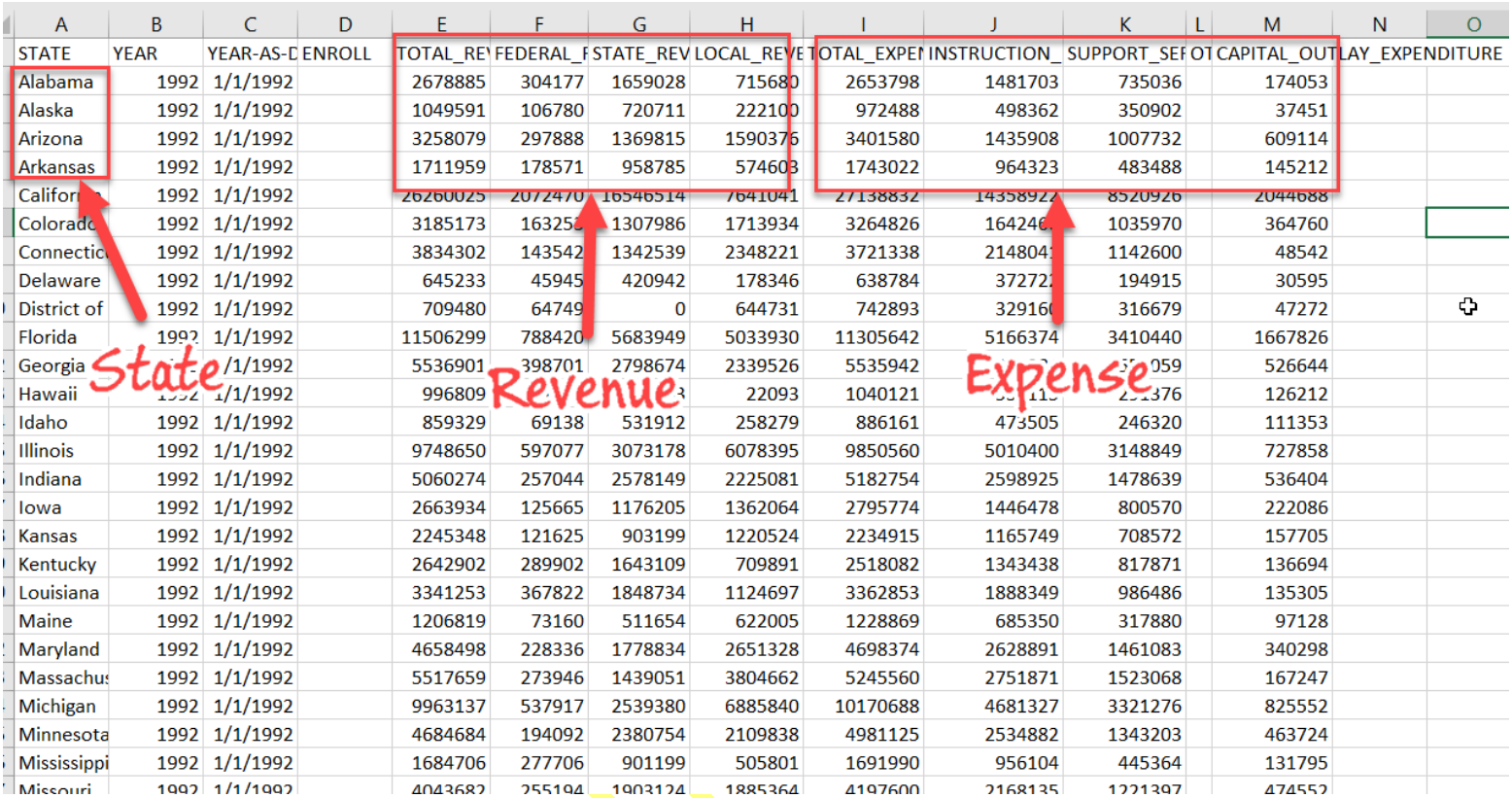
System: SAC Implementation project

Below is the screenshot of all the state wise revenue and expenses



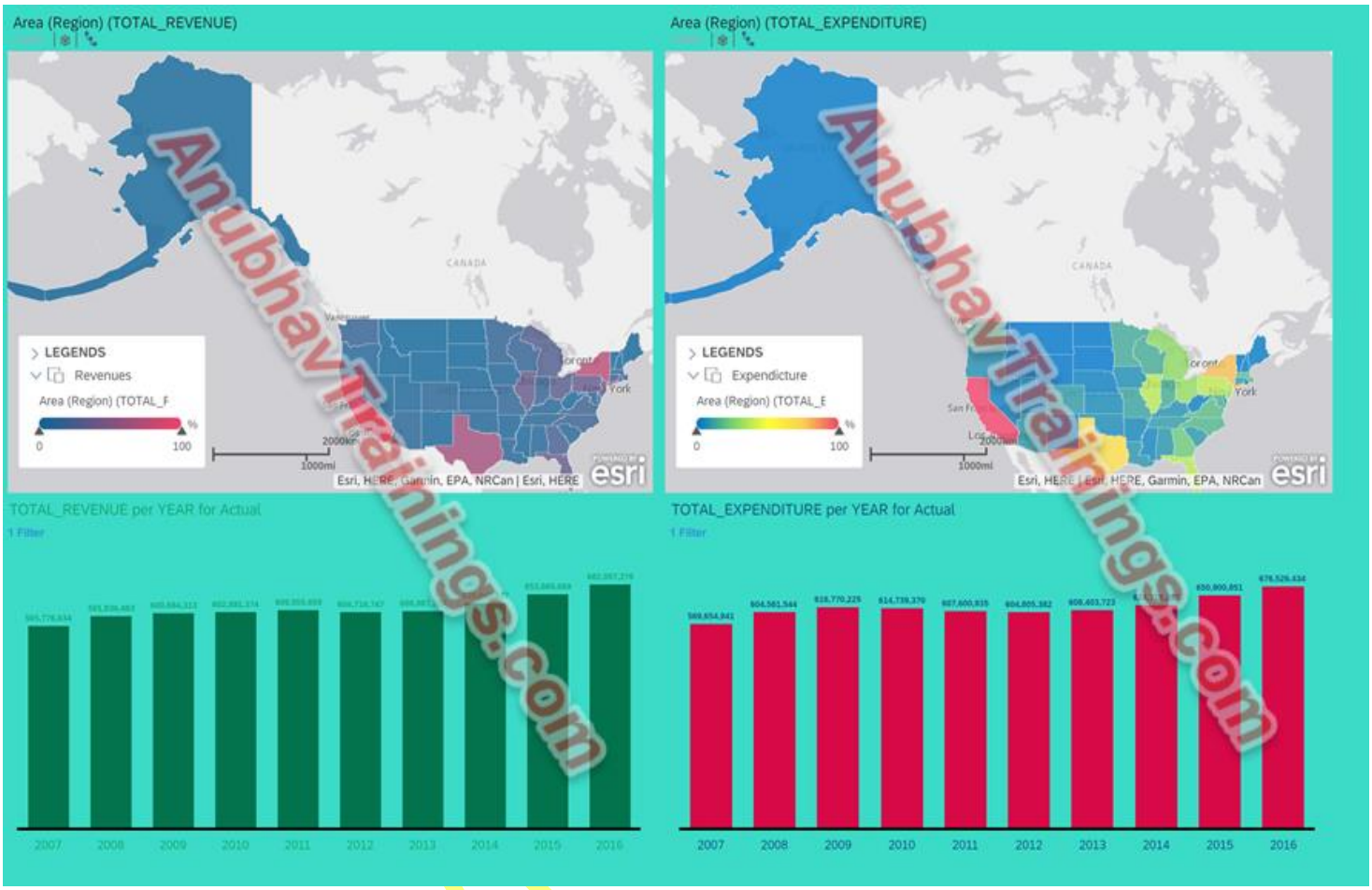
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
STATE	YEAR	YEAR-AS-D	ENROLL	TOTAL_REV	FEDERAL_F	STATE_REV	LOCAL_REVE	TOTAL_EXPEI	INSTRUCTION_	SUPPORT_SEF	OT	CAPITAL_OUT	LAY_EXPEN	DITURE
Alabama	1992	1/1/1992		2678885	304177	1659028	715680	2653798	1481703	735036		174053		
Alaska	1992	1/1/1992		1049591	106780	720711	222100	972488	498362	350902		37451		
Arizona	1992	1/1/1992		3258079	297888	1369815	1590376	3401580	1435908	1007732		609114		
Arkansas	1992	1/1/1992		1711959	178571	958785	574603	1743022	964323	483488		145212		
Californ	1992	1/1/1992		26260025	2072470	16546514	7641041	27138832	14358922	8520926		2044688		
Colorado	1992	1/1/1992		3185173	163252	1307986	1713934	3264826	164246	1035970		364760		
Connecti	1992	1/1/1992		3834302	143542	1342539	2348221	3721338	214804	1142600		48542		
Delaware	1992	1/1/1992		645233	45945	420942	178346	638784	37272	194915		30595		
District of	1992	1/1/1992		709480	64749	0	644731	742893	32916	316679		47272		
Florida	1992	1/1/1992		11506299	788420	5683949	5033930	11305642	5166374	3410440		1667826		
Georgia		/1/1992		5536901	398701	2798674	2339526	5535942		059		526644		
Hawaii	1992	1/1/1992		996809		3	22093	1040121	115	376		126212		
Idaho	1992	1/1/1992		859329	69138	531912	258279	886161	473505	246320		111353		
Illinois	1992	1/1/1992		9748650	597077	3073178	6078395	9850560	5010400	3148849		727858		
Indiana	1992	1/1/1992		5060274	257044	2578149	2225081	5182754	2598925	1478639		536404		
Iowa	1992	1/1/1992		2663934	125665	1176205	1362064	2795774	1446478	800570		222086		
Kansas	1992	1/1/1992		2245348	121625	903199	1220524	2234915	1165749	708572		157705		
Kentucky	1992	1/1/1992		2642902	289902	1643109	709891	2518082	1343438	817871		136694		
Louisiana	1992	1/1/1992		3341253	367822	1848734	1124697	3362853	1888349	986486		135305		
Maine	1992	1/1/1992		1206819	73160	511654	622005	1228869	685350	317880		97128		
Maryland	1992	1/1/1992		4658498	228336	1778834	2651328	4698374	2628891	1461083		340298		
Massachus	1992	1/1/1992		5517659	273946	1439051	3804662	5245560	2751871	1523068		167247		
Michigan	1992	1/1/1992		9963137	537917	2539380	6885840	10170688	4681327	3321276		825552		
Minnesota	1992	1/1/1992		4684684	194092	2380754	2109838	4981125	2534882	1343203		463724		
Mississippi	1992	1/1/1992		1684706	277706	901199	505801	1691990	956104	445364		131795		
Missouri	1992	1/1/1992		4043682	255194	1903124	1885364	4197600	2168135	1221397		474552		

State Revenue Expense

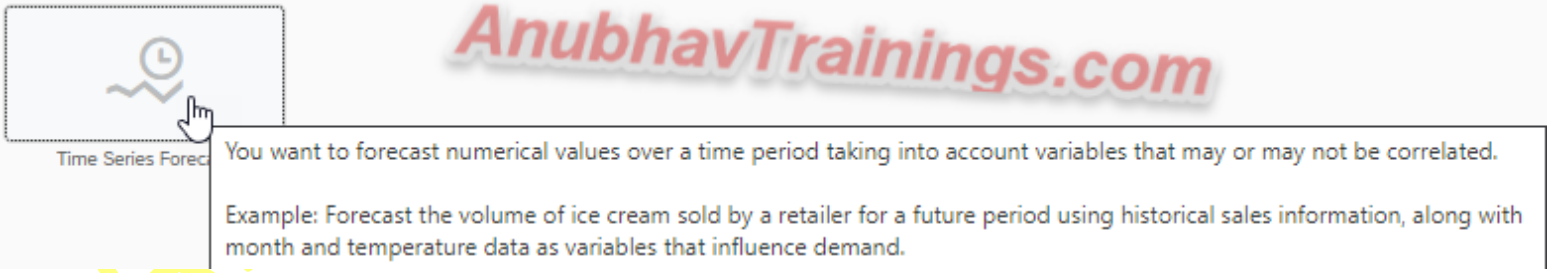
Requirement 1: Create the dataset and model with Geo Enrich of US State

Requirement 2: Create Story as below

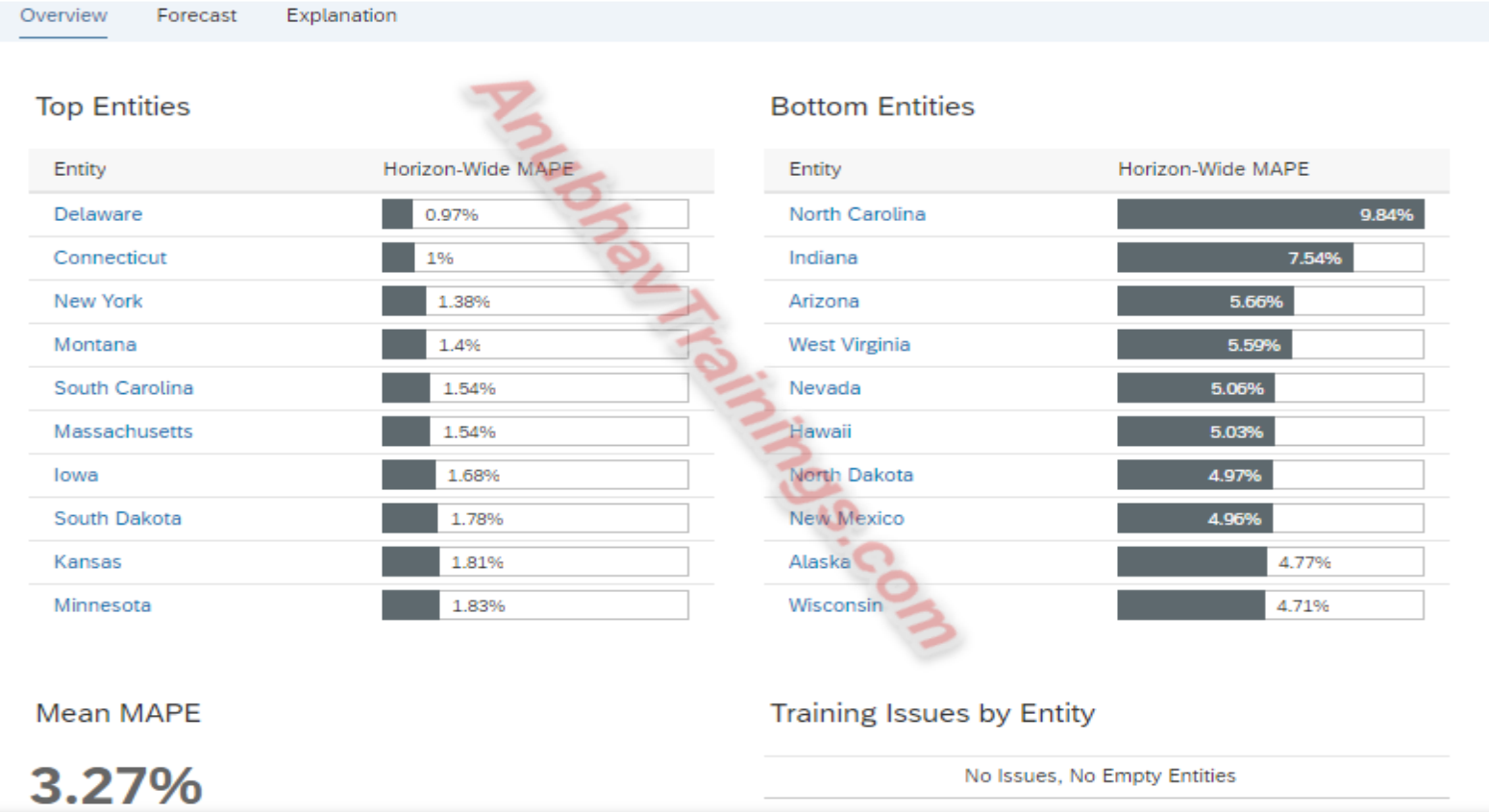
Add Geo Map with Choropleth layer for Area (Region) per Total Revenue & Total Expenditure.
Add Chat for Show Total Revenue & Expenditure as per Year.



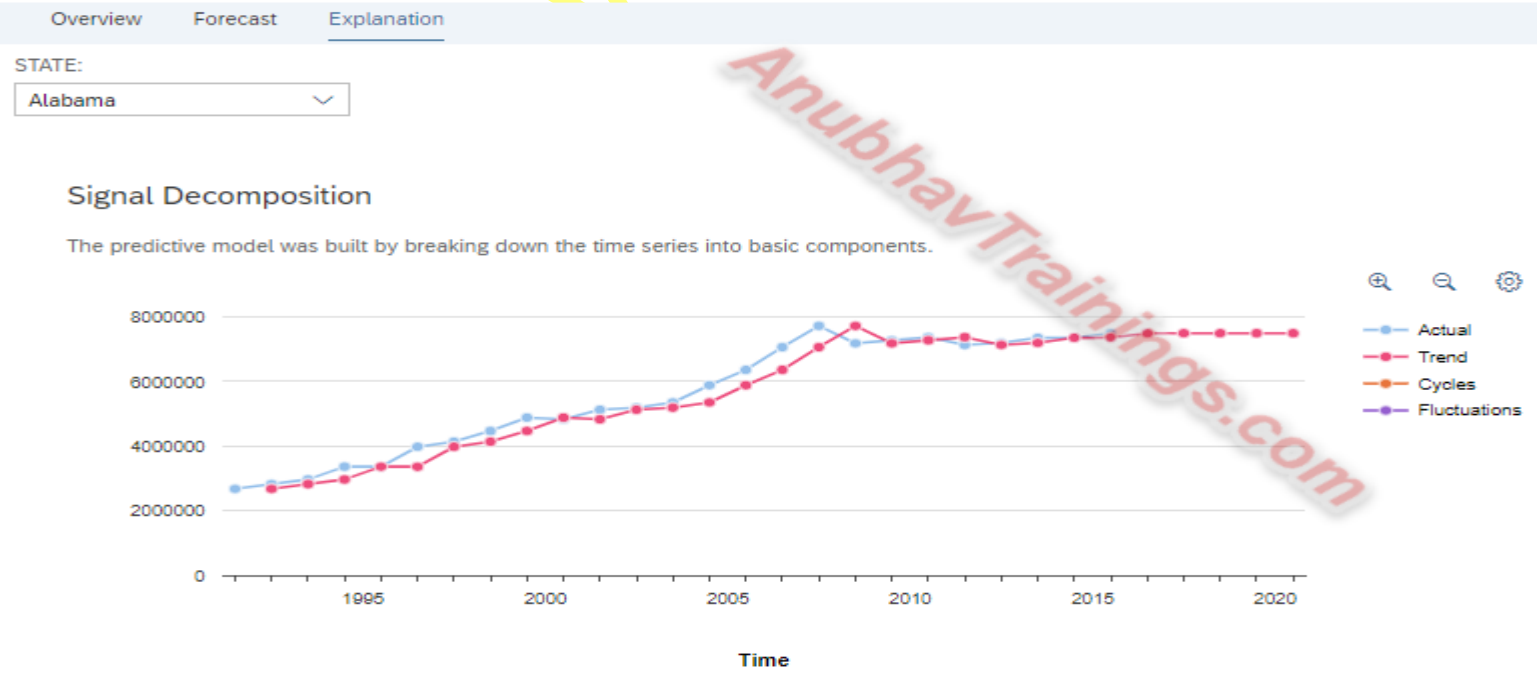
Requirement 3: Create Time Series Predictive Scenario



Requirement 4: Apply the dataset for training and observe the MAPE



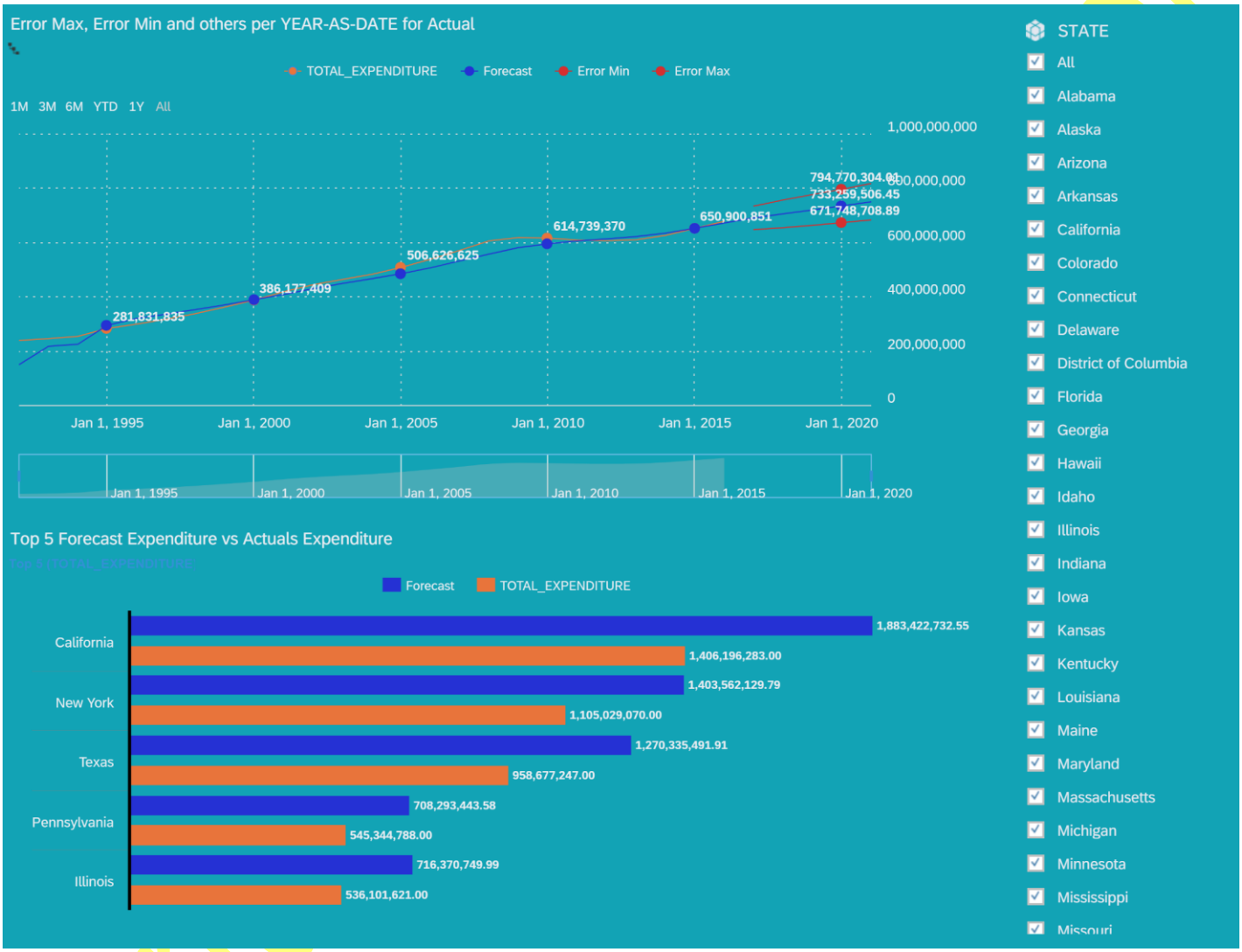
Requirement 5: Understand the Residual Min and Max



Requirement 6: Save the Predicted output to data sets and create BI Models

Requirement 7: Present Expenditure and Revenue data of forecast to a Story as below

(1) Prediction Expenditure.



(2) Prediction Revenue.