Diane Nguyen Homework Assignment 1 Due: 4/1/19

<u>Part 1</u>

- Find the correlation coefficient between calories and fat and the correlation coefficient between calories and calories for the Cereal file. Describe how you find both by showing the steps and the formulas in each step. Please note you may not use COVARIANCE and CORREL Excel functions.

The correlation coefficient between calories and fat was found to be 0.498609814. The steps are:

- Find the averages of calories, fat
- Add a column for the variance in calories and variance in fat. The variances can be found by subtracting each value by the average and summing those values
- Add a column for variance in calories * variance in fat,
- Sum the values for all of the variance in calories * variance in fat
- Take the sum of variance in calories * variance in fat and divide by N
- This will give you the correlation coefficient for calories and fat

name	mfr	type	calories	calories varianc protei	in fa	t	fat variance	CLvR * FAT VA	sodium	fiber	carbo	sugars	potass	vitar
Raisin_Squares	К	C	90	-16.88311688	2	0	-1.012987013	17.10237814	0	2	2 1	5	6 11	0
Rice_Chex	R	С	110	3.116883117	1	0	-1.012987013	-3.157362118	240	() 2	3	2 3	30
Rice_Krispies	К	С	110	3.116883117	2	0	-1.012987013	-3.157362118	290	() 2	2	3 3	5
Shredded_Wheat	N	С	80	-26.88311688	2	0	-1.012987013	27.23224827	0	3	3 1	6	0 9	5
Shredded_Wheat_'n'Bran	N	С	90	-16.88311688	3	0	-1.012987013	17.10237814	0	4	1	9	0 14	+ O
Shredded_Wheat_spoon_size	z N	С	90	-16.88311688	3	0	-1.012987013	17.10237814	0	3	3 2	D	0 12	20
Smacks	K	С	110	3.116883117	2	1	-0.012987013	-0.040479002	70	1	1	9 1	15 4	0
Special_K	К	С	110	3.116883117	6	0	-1.012987013	-3.157362118	230	1	1	6	3 5	5
Strawberry_Fruit_Wheats	N	С	90	-16.88311688	2	0	-1.012987013	17.10237814	15	3	3 1	5	5 9	10
Total_Corn_Flakes	G	С	110	3.116883117	2	1	-0.012987013	-0.040479002	200	0) 2	1	3 3	5
Total_Raisin_Bran	G	С	140	33.11688312	3	1	-0.012987013	-0.430089391	190	4	1	5 1	4 23	0
Total_Whole_Grain	G	С	100	-6.883116883	3	1	-0.012987013	0.089391128	200	3	3 1	6	3 11	0
Triples	G	С	110	3.116883117	2	1	-0.012987013	-0.040479002	250	0) 2	1	3 6	i0
Trix	G	С	110	3.116883117	1	1	-0.012987013	-0.040479002	140	0) 1	3 1	2 2	25
Wheat_Chex	R	С	100	-6.883116883	3	1	-0.012987013	0.089391128	230	3	3 – 1 [°]	7	3 11	5
Wheaties	G	С	100	-6.883116883	3	1	-0.012987013	0.089391128	200	3	3 – 1 [°]	7	3 11	0
Wheaties_Honey_Gold	G	С	110	3.116883117	2	1	-0.012987013	-0.040479002	200	1	1	6	8 6	;0
		sum	8230	-5.68434E-14		78	-4.88498E-15							
		average	106.8831		1	.012987								
		st. dev	19.48412		1	.006473		743.1168831						
		sample covariance	0.243127					9.777853725						
								0.498609814	CORRELA	ATION COF	FEICIENT	FOR FAT	AND CALC)RIFS

The correlation coefficient between calories and fat was found to be 1.00. The steps are:

- Find the averages of calories, and calories
- Add a column for the variance in calories and another for variance in calories. The variances can be found by subtracting each value by the average and summing those values
- Add a column for variance in calories * variance in calories,
- Sum the values for all of the variance in calories * variance in calories
- Take the sum of variance in calories * variance in calories and divide by N
- This will give you the correlation coefficient for calories and calories

name	mfr	type	calories	calories variance	protein	fat	cal variance	CLvR * CLvAR	sodium	fiber	carbo	sugars	potass	vitamins
Quaker_Oatmeal	Q	Н	100	-6.883116883	5	2	-6.883116883	47.37729803	0	2.	7		110	0
Raisin_Bran	K	С	120	13.11688312	3	1	13.11688312	172.0526227	210		5 14	12	240	25
Raisin_Nut_Bran	G	С	100	-6.883116883	3	2	-6.883116883	47.37729803	140	2.	5 10.5	8	140	25
Raisin_Squares	K	С	90	-16.88311688	2	0	-16.88311688	285.0396357	0		2 15	6	110	25
Rice_Chex	R	C	110	3.116883117	1	0	3.116883117	9.714960364	240		0 23	2	30	25
Rice_Krispies	K	С	110	3.116883117	2	0	3.116883117	9.714960364	290		0 22	3	35	25
Shredded_Wheat	N	С	80	-26.88311688	2	0	-26.88311688	722.7019734	0		3 16	0	95	0
Shredded_Wheat_'n'Bran	N	С	90	-16.88311688	3	0	-16.88311688	285.0396357	0		4 19	0	140	0
Shredded_Wheat_spoon_sit	N	С	90	-16.88311688	3	0	-16.88311688	285.0396357	0		3 20	0	120	0
Smacks	K	С	110	3.116883117	2	1	3.116883117	9.714960364	70		1 9	15	40	25
Special_K	K	С	110	3.116883117	6	0	3.116883117	9.714960364	230		1 16	3	55	25
Strawberry_Fruit_Wheats	N	С	90	-16.88311688	2	0	-16.88311688	285.0396357	15		3 15	5	90	25
Total_Corn_Flakes	G	С	110	3.116883117	2	1	3.116883117	9.714960364	200		0 21	3	35	100
Total_Raisin_Bran	G	С	140	33.11688312	3	1	33.11688312	1096.727947	190		4 15	14	230	100
Total_Whole_Grain	G	С	100	-6.883116883	3	1	-6.883116883	47.37729803	200		3 16	3	110	100
Triples	G	С	110	3.116883117	2	1	3.116883117	9.714960364	250		0 21	3	60	25
Trix	G	С	110	3.116883117	1	1	3.116883117	9.714960364	140		0 13	12	25	25
Wheat_Chex	R	С	100	-6.883116883	3	1	-6.883116883	47.37729803	230		3 17	3	115	25
Wheaties	G	С	100	-6.883116883	3	1	-6.883116883	47.37729803	200		3 17	3	110	25
Wheaties_Honey_Gold	G	С	110	3.116883117	2	1	3.116883117	9.714960364	200		1 16	8	60	25
		sum	8230	-5.68434E-14		78	-5.68434E-14							
		average	106.8831			1.012987								
		st. dev	19.48412			19.48412		28851.94805						
		sample covariance	0					379.6308954						
								1.00	CORRELA	TION CO	EFFICIENT I	OR CALO	RIES AND	CALORIES

- Use the Variable Cluster node to find the correlation matrix for the variables Calories, Fat, Protein, and Ratings.

Ratings was not included because it is the target variable.

	calories	fat	protein	
calores	1	0.5073	0.03399	
fat	0.5073	1	0.2023	
protein	0.03399	0.2023	1	

Part 2

Use the given Wine file for this part of the assignment. Turn in the following:

- Principal components using covariance matrix and correlation matrix. Provide both the principal components and their proportions, cumulative proportions, and for each principal component the weights of the original variables. For Correlation:

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	4.977950	2.312099	0.3829	0.3829
2	2.665851	1.294942	0.2051	0.5880
3	1.370909	0.460113	0.1055	0.6934
4	0.910797	0.145753	0.0701	0.7635
5	0.765043	0.217784	0.0588	0.8224
6	0.547260	0.088616	0.0421	0.8644
7	0.458644	0.106563	0.0353	0.8997
8	0.352080	0.088236	0.0271	0.9268
9	0.263845	0.026994	0.0203	0.9471
10	0.236851	0.012888	0.0182	0.9653
11	0.223963	0.090025	0.0172	0.9826
12	0.133938	0.041068	0.0103	0.9929
13	0.092869		0.0071	1.0000

For Covariance:

Eigenvalues of the Covariance Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	110521	110351	0.9983	0.9983
2	170.519772	161.328724	0.0015	0.9998
з	9.191049	4.090007	0.0001	0.9999
4	5.101042	3.916988	0.0000	1.0000
5	1.184054	0.387613	0.0000	1.0000
6	0.796441	0.541547	0.0000	1.0000
7	0.254894	0.138484	0.0000	1.0000
8	0.116410	0.015310	0.0000	1.0000
9	0.101100	0.030648	0.0000	1.0000
10	0.070452	0.033588	0.0000	1.0000
11	0.036864	0.013782	0.0000	1.0000
12	0.023082	0.016638	0.0000	1.0000
13	0.006445		0.0000	1.0000

The Weights For Correlation:

Variable	Label	Prinl	Prin2	Prin3
Alcohol	Alcohol	0.12931	0.49302	-0.17315
Ash	Ash	-0.00982	0.32214	0.63046
Ash_Alcalinity	Ash_Alcalinity	-0.23102	-0.01971	0.61754
Color_Intensity	Color_Intensity	-0.09134	0.52546	-0.13335
Flavanoids	Flavanoids	0.41775	0.00203	0.13353
Hue	Hue	0.28957	-0.28092	0.10876
Magnesium	Magnesium	0.15923	0.30606	0.15020
Malic_Acid	Malic_Acid	-0.26975	0.19583	0.07386
Nonflavanoid_Phenols	Nonflavanoid_Phenols	-0.30624	-0.00281	0.16094
OD280_OD315	0D280_0D315	0.37004	-0.17991	0.13254
Proanthocyanins	Proanthocyanins	0.32812	0.03150	0.14574
Proline	Proline	0.27853	0.35895	-0.15504
Total_Phenols	Total_Phenols	0.38605	0.05918	0.16424
The Weights For Cov	variance:			
Variable	Label	Prinl	Prin2	Prin3
Alcohol	Alcohol	0.00162	0.00802	0.03301
Ash	Ash	0.00016008	0.00488	0.04559
Ash_Alcalinity	Ash_Alcalinity	-0.00452	0.03347	0.90638
Color_Intensity	Color_Intensity	0.00257	0.02127	0.35371
Flavanoids	Flavanoids	0.00160	0.00307	-0.10775
Hue	Hue	0.00013951	-0.00014467	-0.03108
Magnesium	Magnesium	0.01670	0.99902	-0.03760
Malic_Acid	Malic_Acid	-0.00089874	0.00002524	0.14917
Nonflavanoid_Phenols	Nonflavanoid_Phenols	-0.00013237	-0.00250	0.01406
0D280_0D315	0D280_0D315	0.00063496	0.00143	-0.10211
Proanthocyanins	Proanthocyanins	0.00062215	0.00168	-0.03201
Proline	Proline	0.99984	-0.01662	0.00420
Total_Phenols	Total_Phenols	0.00101	0.00333	-0.04787

- Note any major difference(s) between the result sets and explain why the difference(s) exists(exist).

PCA is a method of extracting important variables (in form of components) from a large set of variables available in a data set. It extracts low dimensional set of features from a high dimensional data set in an attempt to capture as much information as it can. PCA is more useful when dealing with 3 or higher dimensional data. It is always performed on a symmetric correlation or covariance matrix. This means the matrix should be numeric and have standardized data. In terms of standardization, all your data should be standardized to measure in the same units. For example you may want to standardize all of your data in terms of a z-score distribution. The purpose of PCA is to try to reduce the number of variables you have, in the first run of the covariance PCA you can see that it accounts for over 99% of your data. Instead you will want to use PCA for correlation it normalizes your data for you.

- Illustrate with a comparative prediction model why it may be necessary to use standardized data in PCA. Show appropriate evidence.

Selected Model	Predecess or Node	Model Node	Model Description	Target Variable	Target Label	Valid: Root Average Squared Error	Selection Criterion: Valid: Misclassifi cation Rate
Y	Reg3	Reg3	Regression	Туре	Туре	0.139832	0.041667
	Reg	Reg	Correlation Regression	Туре	Туре	0.166109	0.041667
	Tree	Tree	Decision Tree	Туре	Туре	0.294383	0.138889
	Reg2	Reg2	Covariance Regression	Туре	Туре	0.349187	0.347222

As you can see, the regression model without principle component analysis has the lowest value for root average squared error.



Part 3 TBD

Use the attached files to finish this part of the assignment.

- For each data file build a comparative model to assess the performances of a regression model with variable selection and a decision model without variable selection. Compare the performances using either LIFT or Root Average Squared Error as appropriate.
 - For ContinuousTargetCategoricalPred

Selected Model	Predecess or Node	Model Node	Model Descriptio n	Target Variable	Target Label	Valid: Root Average Squared Error	Selection Criterion: Valid: Average Squared Error
Y	Tree2	Tree2	Decision	DEPV	DEPV	1.460088	2.131858
	Reg2	Reg2	Regressi	DEPV	DEPV	1.525047	2.325767

• For ContinuousTarget1

Selected Model	Predecess or Node	Model Node	Model Descriptio n	Target Variable	Target Label	Valid: Root Average Squared Error	Selection Criterion: Valid: Average Squared Error
Y	Tree	Tree	Decision	DEPV	DEPV	0.062351	0.003888
	Reg	Reg	Regressi	DEPV	DEPV	1.350833	1.824749

• For BinaryTargetCategoricalPred

Selected Model	Predecess or Node	Model Node	Model Descriptio n	Target Variable	Target Label	Valid: Root Average Squared Error	Selection Criterion: Train: Lift
Y	Reg3	Reg3	Regressi	resp	resp	0.301814	1.437505
	Tree3	Tree3	Decision	resp	resp	0.30013	1

• For BinaryTargetIntervalPred

Selected	Predecess Model [₿]	Model Node	Model Descriptio n	Target Variable	Target Label	Valid: Root Average Squared Error	Selection Criterion: Train: Lift
Y	Reg4	Reg4	Regressi	resp	resp	0.298998	1.478713
	Tree4	Tree4	Decision	resp	resp	0.30013	1

- List the selected variables of the Variable Selection Node in each case.

• F	or	Continuo	usTarge	tCatego	ricalPred:
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CVR14 Input Nominal Character Insumal	Variable Name	Rol	e 🔺	Measu	ement Level	Туре		Label	Reasons for Rejection	1
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nvara in the set of t	NVAR137		Input		Interval		Numeric	NVAR137		
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NNAR224 input Input Herval Numeric NVAR224 NUMERCE • For BinaryTagetCategoricalPred: Variable Name Role A Messurement Level Type Label Reasons for Rejector NAR027 Input Interval Numeric NVAR027 NAR033 Input Interval Numeric NVAR033 NAR0404 Input Interval Numeric NVAR034 NAR0404 Input Interval Numeric NVAR044 NVAR044 Input Interval Numeric NVAR048 NVAR045 Input Interval Numeric NVAR048 NVAR046 Input Interval Numeric NVAR048 NVAR047 Input Interval Numeric NVAR048 NVAR048 Input Interval Numeric NVAR048 NVAR049 Input Interval Numeric NVAR048 NVAR049 Input Interval Numeric NVAR048 NVAR049 Input	NVAR176		Input		Interval		Numeric	NVAR176		
NVAPC42 input interval Numeric NVAPC42 • For Binary Target Categorical Pred: Variade Name Role ▲ Measument Level Type Label Reasons for Rejection NVAP027 Input Interval Numeric NVAP027 Reasons for Rejection NVAP024 Input Interval Numeric NVAP023 Reasons for Rejection NVAP024 Input Interval Numeric NVAP024 Reasons for Rejection NVAP024 Input Interval Numeric NVAP024 Reasons for Rejection NVAP024 Input Interval Numeric NVAP034 Input Interval Numeric NVAP034 NVAP025 Input Interval Numeric NVAP034 Input Interval Numeric NVAP036 Input <td>NVAR224</td> <td></td> <td>Input</td> <td></td> <td>Interval</td> <td></td> <td>Numeric</td> <td>NVAR224</td> <td></td> <td></td>	NVAR224		Input		Interval		Numeric	NVAR224		
For BinaryTargetCategoricalPred: Variable Name Role A Measuremet Level Type Label Reasons for Rejector NVAR027 trput interval Numeric NVAR033 input interval Numeric NVAR033 input interval Numeric NVAR034 input interval Numeric NVAR034 input interval Numeric NVAR048 input interval Numeric NVAR048 input interval Numeric NVAR049 input interval Numeric NVAR050 input interval Numeri	NVAR242		Input		Interval		Numeric	NVAR242		
Variable NameRoleMeasurement LevelTypeLabelReasons for RejectionNVAR027nputInfernalNurmericNVAR027NVAR033nputInfernalNurmericNVAR033NVAR044nputInfernalNurmericNVAR044NVAR045nputInfernalNurmericNVAR044NVAR046nputInfernalNurmericNVAR048NVAR047nputInfernalNurmericNVAR048NVAR048nputInfernalNurmericNVAR048NVAR046nputInfernalNurmericNVAR051NVAR057nputInfernalNurmericNVAR051NVAR058nputInfernalNurmericNVAR051NVAR059nputInfernalNurmericNVAR051NVAR050nputInfernalNurmericNVAR051NVAR051nputInfernalNurmericNVAR051NVAR052nputInfernalNurmericNVAR051NVAR054nputInfernalNurmericNVAR051NVAR054nputInfernalNurmericNVAR051NVAR054nputInfernalNurmericNVAR051NVAR054nputInfernalNurmericNVAR051NVAR054nputInfernalNurmericNVAR051NVAR054nputInfernalNurmericNVAR051NVAR054nputInfernalNurmericNVAR161NVAR054nputInfernalNurmeric	• Fo	or E	BinaryTargetCa	ategor	ricalPred:					
NVAR027 Input Interval Numeric NVAR033 NVAR033 Input Interval Numeric NVAR033 NVAR044 Input Interval Numeric NVAR048 NVAR048 Input Interval Numeric NVAR048 NVAR049 Input Interval Numeric NVAR048 NVAR050 Input Interval Numeric NVAR050 NVAR056 Input Interval Numeric NVAR051 NVAR056 Input Interval Numeric NVAR050 NVAR050 Input Interval Numeric NVAR051 NVAR051 Input Interval Numeric NVAR050 NVAR052 Input Interval Numeric NVAR050 NVAR054 Input Interval Numeric NVAR050 NVAR050 Input Interval Numeric NVAR050 NVAR051 Input Interval Numeric NVAR050 NVAR052	Variable Name		Role 🔺		Measurement Level		Туре	Label	Reason	is for Rejection
NAR033InduIndexiaNumericNVAR034NVAR034inputIntervalNumericNVAR034NVAR048inputIntervalNumericNVAR049NVAR049inputIntervalNumericNVAR0409NVAR050inputIntervalNumericNVAR056NVAR056inputIntervalNumericNVAR056NVAR056inputIntervalNumericNVAR056NVAR056inputIntervalNumericNVAR056NVAR056inputIntervalNumericNVAR066NVAR057inputIntervalNumericNVAR066NVAR068inputIntervalNumericNVAR066NVAR069inputIntervalNumericNVAR060NVAR060inputIntervalNumericNVAR060NVAR060inputIntervalNumericNVAR060NVAR060inputIntervalNumericNVAR060NVAR060inputIntervalNumericNVAR106NVAR108inputIntervalNumericNVAR106NVAR117inputIntervalNumericNVAR122NVAR122inputIntervalNumericNVAR122NVAR125inputIntervalNumericNVAR128NVAR133inputIntervalNumericNVAR133NVAR133inputIntervalNumericNVAR133NVAR134inputIntervalNumericNVAR133NVAR135<	NVAR027	-	nput		nterval		lumeric	NVAR027		
NVAR04InputIntervalNumericIVVAR04NVAR049inputIntervalNumericIVVAR049NVAR050InputIntervalNumericIVVAR050NVAR051InputIntervalNumericIVVAR054NVAR052InputIntervalNumericIVVAR055NVAR053InputIntervalNumericIVVAR055NVAR054InputIntervalNumericIVVAR055NVAR050InputIntervalNumericIVVAR050NVAR090InputIntervalNumericIVVAR050NVAR091InputIntervalNumericIVVAR050NVAR092InputIntervalNumericIVVAR050NVAR094InputIntervalNumericIVVAR064NVAR105InputIntervalNumericIVVAR064NVAR116InputIntervalNumericIVVAR106NVAR117InputIntervalNumericIVVAR106NVAR122InputIntervalNumericIVVAR125NVAR123InputIntervalNumericIVVAR125NVAR133InputIntervalNumericIVVAR136NVAR134InputIntervalNumericIVVAR136NVAR135InputIntervalNumericIVVAR137NVAR136InputIntervalNumericIVVAR136NVAR137InputIntervalNumericIVVAR136NVAR151InputIntervalNumericIVVAR136 <td>NVAR033</td> <td></td> <td>nput</td> <td></td> <td>nterval</td> <td></td> <td>Jumeric</td> <td>NVAR033</td> <td></td> <td></td>	NVAR033		nput		nterval		Jumeric	NVAR033		
NVAR049inputIntervalNumericNVAR049NVAR050inputIntervalNumericNVAR050NVAR054inputIntervalNumericNVAR054NVAR056inputIntervalNumericNVAR056NVAR056inputIntervalNumericNVAR056NVAR086inputIntervalNumericNVAR090NVAR090inputIntervalNumericNVAR092NVAR092inputIntervalNumericNVAR094NVAR094inputIntervalNumericNVAR094NVAR096inputIntervalNumericNVAR094NVAR097inputIntervalNumericNVAR100NVAR106inputIntervalNumericNVAR106NVAR117inputIntervalNumericNVAR116NVAR122inputIntervalNumericNVAR117NVAR125inputIntervalNumericNVAR122NVAR126inputIntervalNumericNVAR128NVAR133inputIntervalNumericNVAR136NVAR134inputIntervalNumericNVAR136NVAR151inputIntervalNumericNVAR137NVAR154inputIntervalNumericNVAR137NVAR154inputIntervalNumericNVAR137NVAR154inputIntervalNumericNVAR137NVAR154inputIntervalNumericNVAR137NVAR15	NVAR048		Input	i	nterval	i	lumeric	NVAR048		
NVAR050InputIntervalNumericNVAR050NVAR054InputIntervalNumericNVAR054NVAR055InputIntervalNumericNVAR055NVAR086InputIntervalNumericNVAR050NVAR090InputIntervalNumericNVAR090NVAR092InputIntervalNumericNVAR094NVAR044InputIntervalNumericNVAR094NVAR055InputIntervalNumericNVAR040NVAR066InputIntervalNumericNVAR040NVAR076InputIntervalNumericNVAR0760NVAR107InputIntervalNumericNVAR106NVAR118InputIntervalNumericNVAR116NVAR122InputIntervalNumericNVAR125NVAR123InputIntervalNumericNVAR125NVAR133InputIntervalNumericNVAR136NVAR133InputIntervalNumericNVAR136NVAR134InputIntervalNumericNVAR136NVAR135InputIntervalNumericNVAR136NVAR136InputIntervalNumericNVAR136NVAR137InputIntervalNumericNVAR136NVAR136InputIntervalNumericNVAR141NVAR137InputIntervalNumericNVAR141NVAR136InputIntervalNumericNVAR141NVAR1	NVAR049		nput		nterval	1	lumeric	NVAR049		
nvrktor	NVAR050		nput		nterval		Numeric	NVAR050		
NARQ85InputIntervalNumericNURQ85NVARQ90InputIntervalNumericNVARQ92NVARQ94InputIntervalNumericNVARQ94NVARQ94InputIntervalNumericNVARQ94NVARQ94InputIntervalNumericNVARQ94NVARQ94InputIntervalNumericNVARQ94NVAR100InputIntervalNumericNVAR106NVAR116InputIntervalNumericNVAR116NVAR122InputIntervalNumericNVAR116NVAR122InputIntervalNumericNVAR122NVAR123InputIntervalNumericNVAR122NVAR128InputIntervalNumericNVAR126NVAR133InputIntervalNumericNVAR128NVAR137InputIntervalNumericNVAR133NVAR137InputIntervalNumericNVAR136NVAR137InputIntervalNumericNVAR137NVAR137InputIntervalNumericNVAR137NVAR151InputIntervalNumericNVAR14NVAR174InputIntervalNumericNVAR14NVAR174InputIntervalNumericNVAR14NVAR174InputIntervalNumericNVAR174NVAR176InputIntervalNumericNVAR176NVAR224InputIntervalNumericNVAR24NVAR224	NVAR054 NVAR065		input		nerval		lumeric	NVAR054 NVAR065		
NVAR090InputIntervalNumericNVAR090NVAR092InputIntervalNumericNVAR092NVAR094InputIntervalNumericNVAR094NVAR100InputIntervalNumericNVAR100NVAR106InputIntervalNumericNVAR106NVAR106InputIntervalNumericNVAR106NVAR117InputIntervalNumericNVAR116NVAR122InputIntervalNumericNVAR122NVAR123InputIntervalNumericNVAR122NVAR124InputIntervalNumericNVAR125NVAR125InputIntervalNumericNVAR126NVAR128InputIntervalNumericNVAR128NVAR133InputIntervalNumericNVAR133NVAR134InputIntervalNumericNVAR136NVAR137InputIntervalNumericNVAR136NVAR137InputIntervalNumericNVAR137NVAR137InputIntervalNumericNVAR137NVAR137InputIntervalNumericNVAR14NVAR174InputIntervalNumericNVAR174NVAR174InputIntervalNumericNVAR174NVAR176InputIntervalNumericNVAR174NVAR224InputIntervalNumericNVAR242NVAR224InputIntervalNumericNVAR242 <td>NVAR085</td> <td></td> <td>nput</td> <td></td> <td>nterval</td> <td></td> <td>lumeric</td> <td>NVAR085</td> <td></td> <td></td>	NVAR085		nput		nterval		lumeric	NVAR085		
NVAR092InputIntervalNumericNVAR092NVAR094inputIntervalNumericNVAR094NVAR100inputIntervalNumericNVAR100NVAR106inputIntervalNumericNVAR106NVAR106inputIntervalNumericNVAR116NVAR117inputIntervalNumericNVAR117NVAR122inputIntervalNumericNVAR122NVAR123inputIntervalNumericNVAR122NVAR133inputIntervalNumericNVAR123NVAR133inputIntervalNumericNVAR133NVAR134inputIntervalNumericNVAR134NVAR135inputIntervalNumericNVAR136NVAR137inputIntervalNumericNVAR136NVAR137inputIntervalNumericNVAR137NVAR151inputIntervalNumericNVAR137NVAR174inputIntervalNumericNVAR141NVAR174inputIntervalNumericNVAR174NVAR176inputIntervalNumericNVAR174NVAR242inputIntervalNumericNVAR174	NVAR090		nput	İ	nterval	i	lumeric	NVAR090		
NVAR094inputintervalNumericNVAR04NVAR100liputlintervalNumericNVAR106NVAR106inputlintervalNumericNVAR106NVAR116inputlintervalNumericNVAR116NVAR122inputlintervalNumericNVAR117NVAR122inputlintervalNumericNVAR122NVAR125inputlintervalNumericNVAR122NVAR128inputlintervalNumericNVAR128NVAR133inputlintervalNumericNVAR133NVAR136inputlintervalNumericNVAR133NVAR137inputlintervalNumericNVAR136NVAR137inputlintervalNumericNVAR137NVAR137inputlintervalNumericNVAR137NVAR137inputlintervalNumericNVAR137NVAR174inputlintervalNumericNVAR141NVAR174inputlintervalNumericNVAR141NVAR174inputlintervalNumericNVAR176NVAR244inputlintervalNumericNVAR176NVAR242inputlintervalNumericNVAR242NVAR242inputlintervalNumericNVAR242	NVAR092		nput		nterval		lumeric	NVAR092		
NVAR100IndexIntervalNumericNVAR106NVAR106InputIntervalNumericNVAR116NVAR118InputIntervalNumericNVAR117NVAR122InputIntervalNumericNVAR122NVAR122InputIntervalNumericNVAR122NVAR123InputIntervalNumericNVAR128NVAR124InputIntervalNumericNVAR128NVAR125InputIntervalNumericNVAR133NVAR133InputIntervalNumericNVAR133NVAR136InputIntervalNumericNVAR136NVAR137InputIntervalNumericNVAR136NVAR137InputIntervalNumericNVAR137NVAR137InputIntervalNumericNVAR151NVAR174InputIntervalNumericNVAR151NVAR174InputIntervalNumericNVAR174NVAR242InputIntervalNumericNVAR176NVAR242InputIntervalNumericNVAR242NVAR242InputIntervalNumericNVAR242	NVAR094	-	nput		nterval		lumeric	NVAR094		
NVAR116InputIntervalNumericNVAR116NVAR117inputIntervalNumericNVAR117NVAR122inputIntervalNumericNVAR122NVAR125inputIntervalNumericNVAR125NVAR123inputIntervalNumericNVAR128NVAR133inputIntervalNumericNVAR138NVAR134inputIntervalNumericNVAR138NVAR137inputIntervalNumericNVAR136NVAR137inputIntervalNumericNVAR136NVAR137inputIntervalNumericNVAR137NVAR137inputIntervalNumericNVAR151NVAR174inputIntervalNumericNVAR161NVAR174inputIntervalNumericNVAR174NVAR176inputIntervalNumericNVAR174NVAR224inputIntervalNumericNVAR224NVAR242inputIntervalNumericNVAR242	NVAR100		nput		nterval		Jumeric	NVAR100		
NVAR117InputIntervalNumericNVAR117NVAR122InputIntervalNumericNVAR122NVAR125InputIntervalNumericNVAR125NVAR128InputIntervalNumericNVAR128NVAR133InputIntervalNumericNVAR133NVAR134InputIntervalNumericNVAR136NVAR137InputIntervalNumericNVAR136NVAR137InputIntervalNumericNVAR137NVAR137InputIntervalNumericNVAR151NVAR137InputIntervalNumericNVAR151NVAR174InputIntervalNumericNVAR174NVAR176InputIntervalNumericNVAR174NVAR224InputIntervalNumericNVAR224NVAR242InputIntervalNumericNVAR24	NVAR116		Input		nterval	i	lumeric	NVAR116		
NVAR122 Input Interval Numeric NVAR125 NVAR125 Input Interval Numeric NVAR125 NVAR133 Input Interval Numeric NVAR133 NVAR133 Input Interval Numeric NVAR133 NVAR134 Input Interval Numeric NVAR136 NVAR137 Input Interval Numeric NVAR137 NVAR137 Input Interval Numeric NVAR137 NVAR151 Input Interval Numeric NVAR147 NVAR174 Input Interval Numeric NVAR147 NVAR176 Input Interval Numeric NVAR176 NVAR224 Input Interval Numeric NVAR176 NVAR224 Input Interval Numeric NVAR242	NVAR117		nput		nterval	1	lumeric	NVAR117		
NVAR125inputinfervalNumericNVAR125NVAR133inputintervalNumericNVAR133NVAR133inputintervalNumericNVAR136NVAR136inputintervalNumericNVAR136NVAR137inputintervalNumericNVAR137NVAR151inputintervalNumericNVAR151NVAR174inputintervalNumericNVAR151NVAR174inputintervalNumericNVAR174NVAR176inputintervalNumericNVAR176NVAR244inputintervalNumericNVAR24NVAR242inputintervalNumericNVAR24	NVAR122		nput		nterval		lumeric	NVAR122		
NVAR133InputIntervalNumericNVAR133NVAR133InputIntervalNumericNVAR133NVAR137InputIntervalNumericNVAR137NVAR137InputIntervalNumericNVAR137NVAR137InputIntervalNumericNVAR137NVAR174InputIntervalNumericNVAR151NVAR174InputIntervalNumericNVAR174NVAR176InputIntervalNumericNVAR176NVAR242InputIntervalNumericNVAR242NVAR242InputIntervalNumericNVAR242	NVAR125 NV/AR128		nput		nterval		vumeric	NVAR125		
NVAR138 Input Interval Numeric NVAR136 NVAR137 Input Interval Numeric NVAR137 NVAR141 Input Interval Numeric NVAR151 NVAR141 Input Interval Numeric NVAR174 NVAR174 Input Interval Numeric NVAR174 NVAR176 Input Interval Numeric NVAR176 NVAR224 Input Interval Numeric NVAR224 NVAR222 Input Interval Numeric NVAR224 VAR222 Input Interval Numeric NVAR242	NVAR133		Input		nterval		lumeric	NVAR120		
NVAR137 Input Interval Numeric NVAR137 NVAR151 Input Interval Numeric NVAR151 NVAR174 Input Interval Numeric NVAR174 NVAR174 Input Interval Numeric NVAR174 NVAR176 Input Interval Numeric NVAR176 NVAR224 Input Interval Numeric NVAR224 NVAR222 Input Interval Numeric NVAR242	NVAR136		Input		nterval		lumeric	NVAR136		
NVAR151 Input Interval Numeric NVAR151 NVAR174 Input Interval Numeric NVAR174 NVAR176 Input Interval Numeric NVAR176 NVAR244 Input Interval Numeric NVAR224 NVAR224 Input Interval Numeric NVAR224 NVAR244 Input Interval Numeric NVAR224	NVAR137		nput	I	nterval	1	lumeric	NVAR137		
Inversit/4 Input Interval Numeric NVAR1/4 NVAR176 Input Interval Numeric NVAR176 NVAR224 Input Interval Numeric NVAR224 NVAR224 Input Interval Numeric NVAR24 NVAR242 Input Interval Numeric NVAR24	NVAR151		nput		nterval	1	lumeric	NVAR151		
NVAR24 Input Interval Numeric NVAR24 NVAR24 Input Interval Numeric NVAR24 NVAR24 Input Interval Numeric NVAR24	NVAR174		nput		nterval		Numeric			
NVAR242 Input Interval Numeric NVAR242	NVAR224		Input		nterval		lumeric	NVAR224		
	NVAR242		input	i	nterval		lumeric	NVAR242		

• For BinaryTargetIntervalPred:

Variable Name	Role 🔺	Measurement Level	Туре	Label	Reasons for Rejection
NVAR224	Input	Interval	Numeric	NVAR224	
NVAR315	Input	Interval	Numeric	NVAR315	

- Turn in the flow diagram of all the models.

