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PROJECT - ACME Credit Card DATA ANALYSIS Using IBM SPSS Modeler

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ACME Credit Card Data Analysis using IBM SPSS Modeler

Agenda / Definition

This project analyzes customer credit card data from the ACME dataset using IBM SPSS Modeler.
The goal is to identify how customers use their credit limits, find those who spend beyond their limit, and group customers into meaningful segments.
The analysis involves deriving new variables, setting flags for overspending behavior, and examining relationships among variables such as bonus and gender.

Outcomes / Learning

- After completing this project, you will be able to:
- Understand how to import and prepare data in IBM SPSS Modeler.
- Derive new fields and perform calculations within the stream.
- Create flag variables to mark special conditions (like overspending).
- Segment customers into behavioral groups.
- Visualize results using table outputs for interpretation
- Apply the CRISP-DM process (Data Understanding → Data Preparation → Modeling → Evaluation → Deployment).

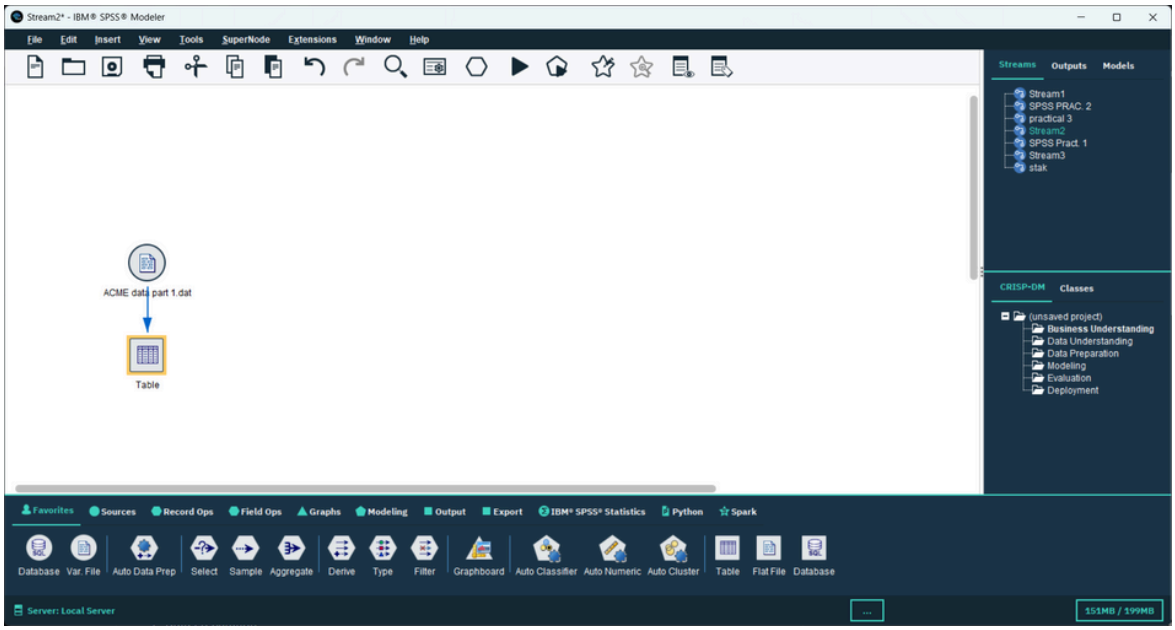
Required Tools

The tool used for this project is IBM SPSS Modeler.

Working

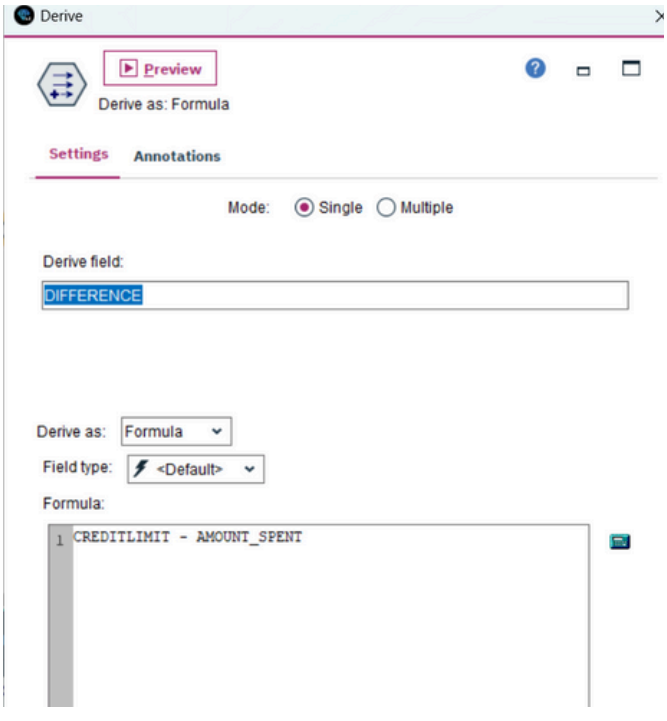
Step 1: Import Data

- Used Var. File Node to import the dataset ACME data part 1.dat.
- Contains key fields such as CREDITLIMIT_Dollar, AMOUNT_SPENT_Dollar, BONUS, and GENDER.



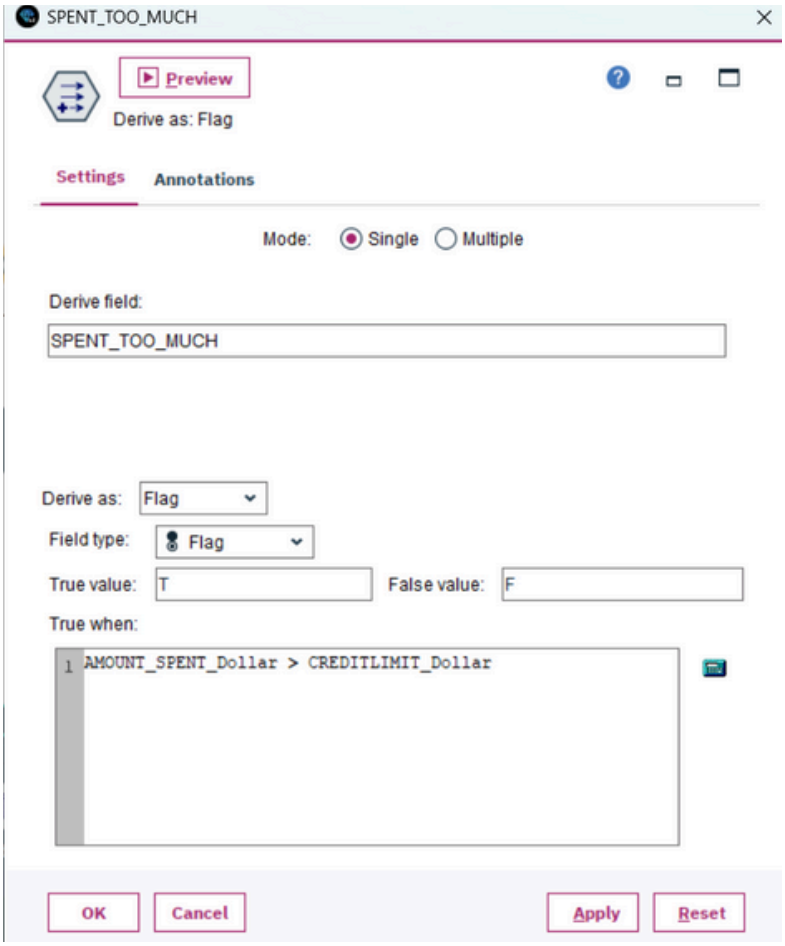
Step 2: Derive (DIFFERENCE)

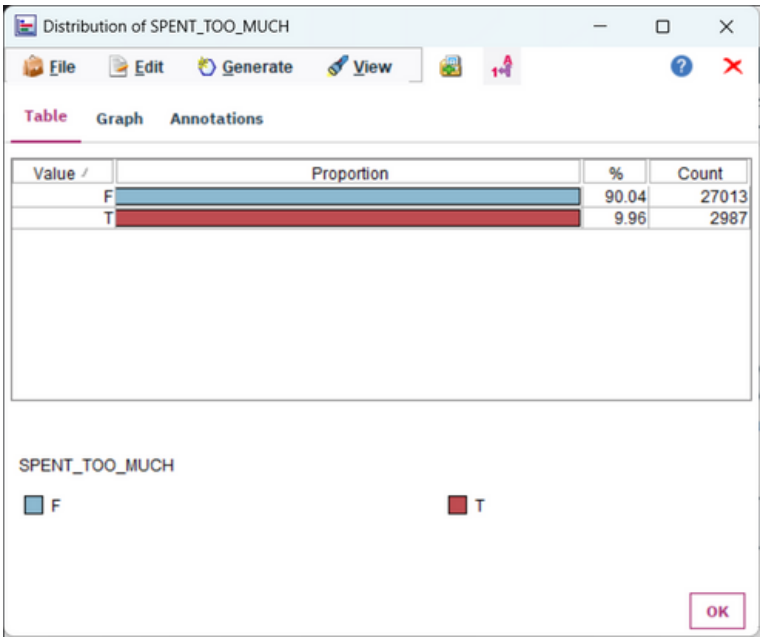
- Added a Derive Node named DIFFERENCE to calculate:
- DIFFERENCE = CREDITLIMIT_Dollar - AMOUNT_SPENT_Dollar
- Helps identify how much of the credit limit is still available or overspent.



Step 3 : SetToFlag Node (SPENT_TOO_MUCH)

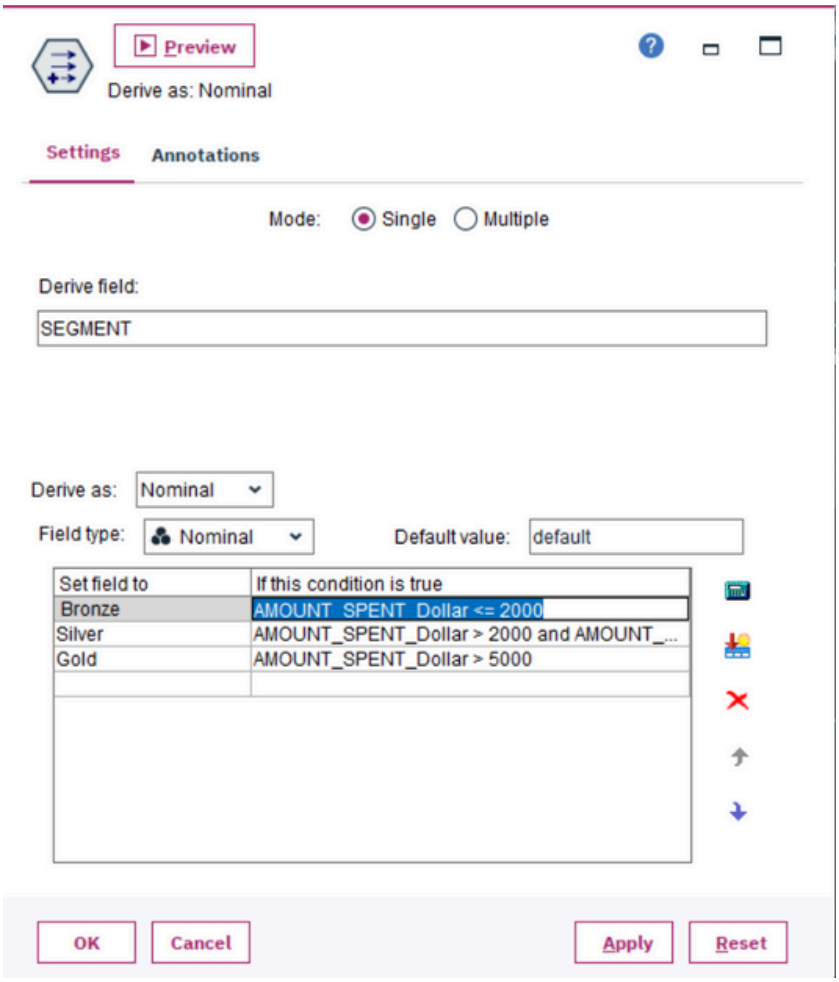
- Created a new binary variable SPENT_TOO_MUCH:
- If Amount Spent > Credit Limit, then 1 (Yes)
- Else 0 (No)
- Used the SetToFlag Node to implement this condition.

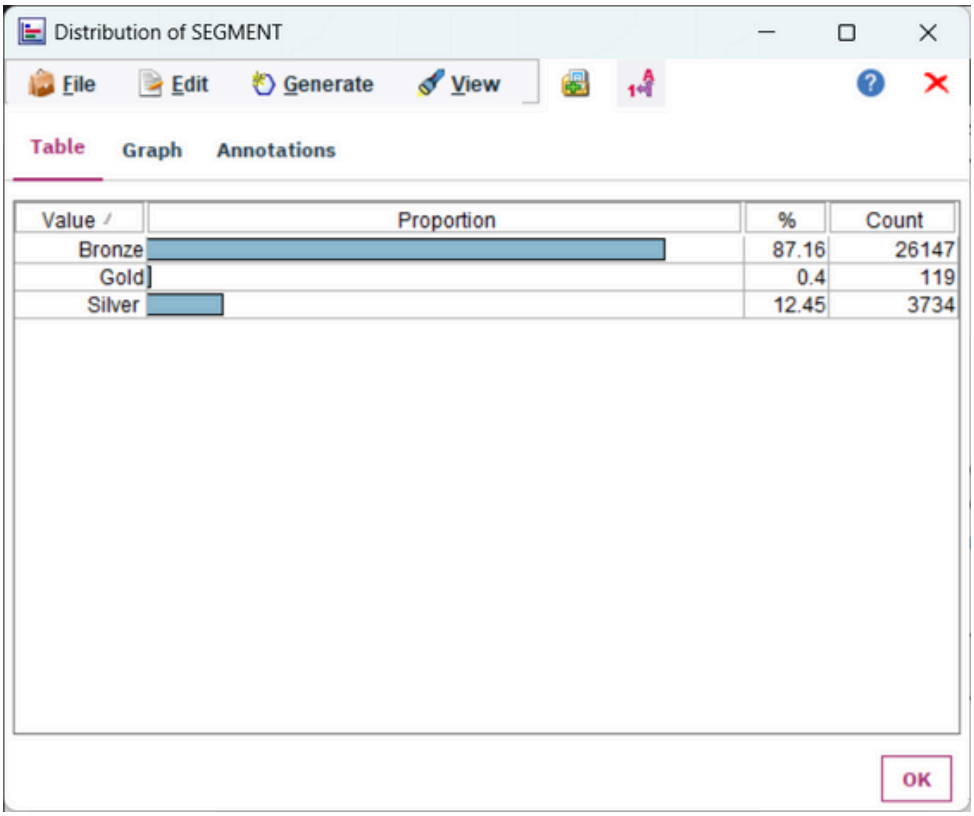




Step 4 : Segment Customers::

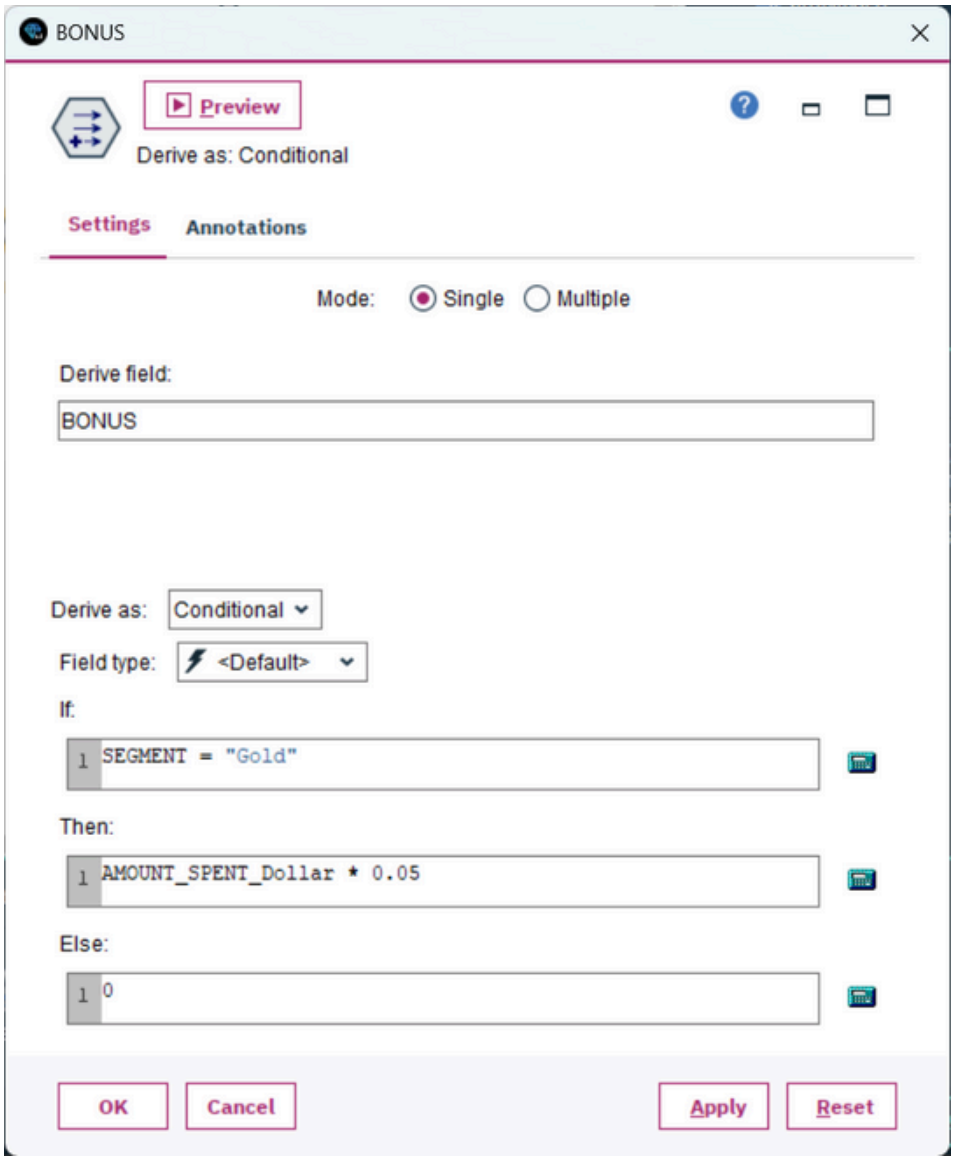
Added a Segment node to group customers based on spending behavior and gender.

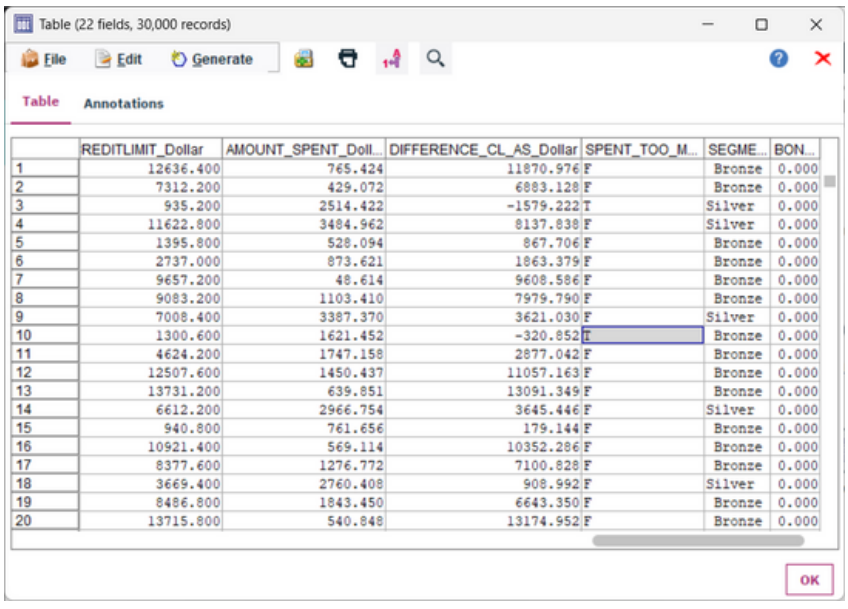




Step 5 : Bonus Analysis:

Added Bonus node to study if bonuses relate to overspending behavior

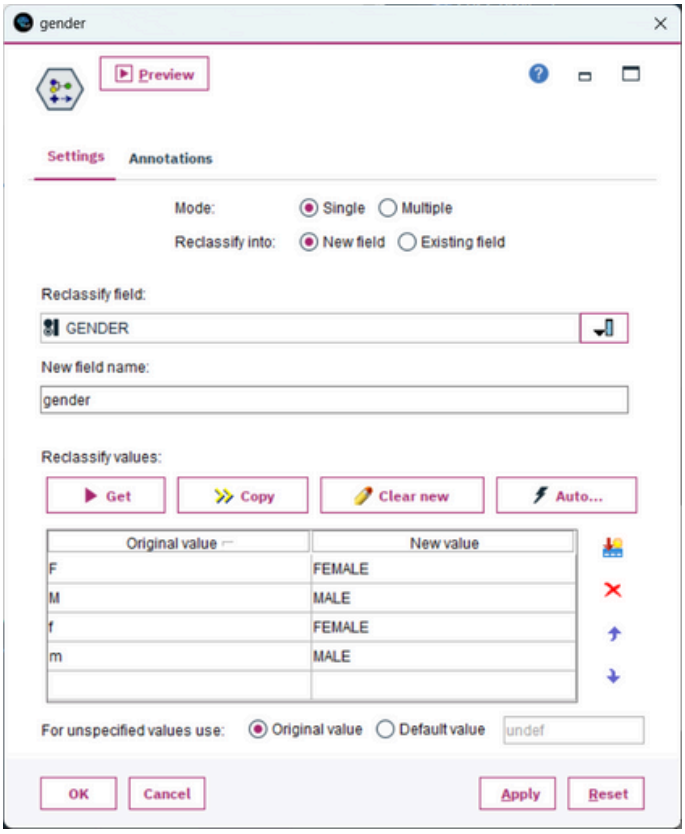


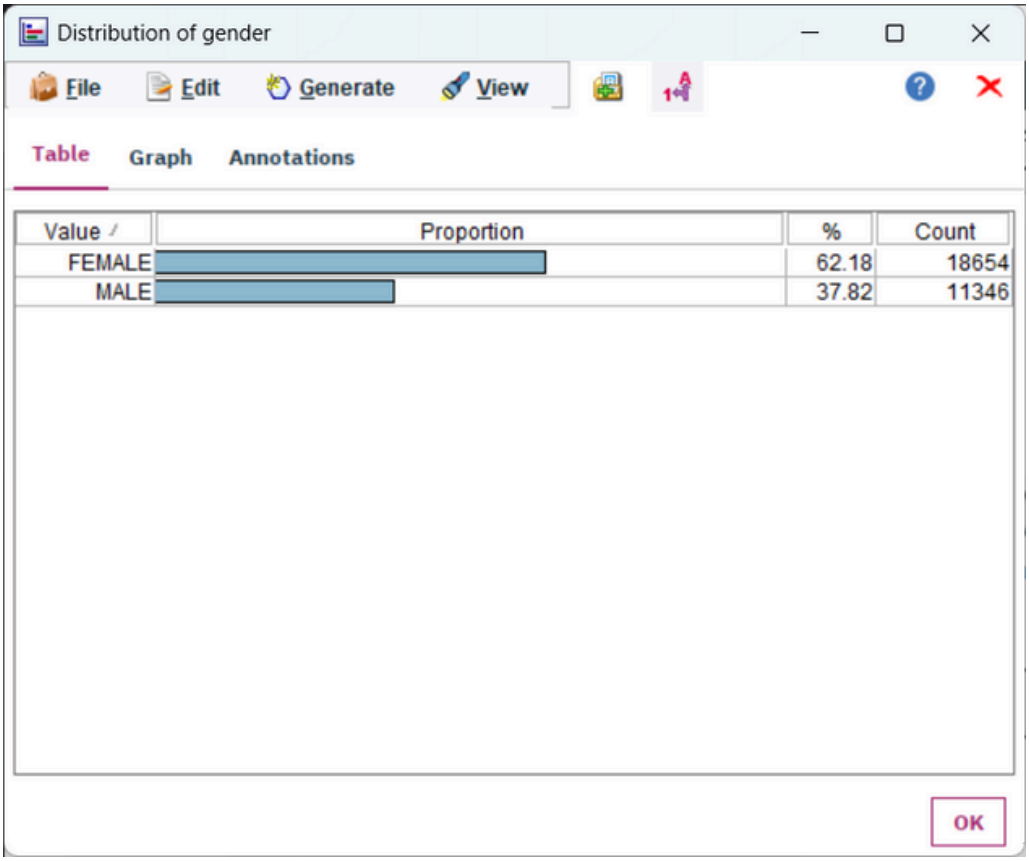


	REDITLIMIT_Dollar	AMOUNT_SPENT_Doll...	DIFFERENCE_CL_AS_Dollar	SPENT_TOO_M...	SEGME...	BON...
1	12636.400	765.424	11870.976	F	Bronze	0.000
2	7312.200	429.072	6883.128	F	Bronze	0.000
3	935.200	2514.422	-1579.222	T	Silver	0.000
4	11622.800	3484.962	8137.838	F	Silver	0.000
5	1395.800	528.094	867.706	F	Bronze	0.000
6	2737.000	873.621	1863.379	F	Bronze	0.000
7	9657.200	48.614	9608.586	F	Bronze	0.000
8	9083.200	1103.410	7979.790	F	Bronze	0.000
9	7008.400	3387.370	3621.030	F	Silver	0.000
10	1300.600	1621.452	-320.852	T	Bronze	0.000
11	4624.200	1747.158	2877.042	F	Bronze	0.000
12	12507.600	1450.437	11057.163	F	Bronze	0.000
13	13731.200	639.851	13091.349	F	Bronze	0.000
14	6612.200	2966.754	3645.446	F	Silver	0.000
15	940.800	761.656	179.144	F	Bronze	0.000
16	10921.400	569.114	10352.286	F	Bronze	0.000
17	8377.600	1276.772	7100.828	F	Bronze	0.000
18	3669.400	2760.408	908.992	F	Silver	0.000
19	8486.800	1843.450	6643.350	F	Bronze	0.000
20	13715.800	540.848	13174.952	F	Bronze	0.000

Step 6 : Gender Analysis

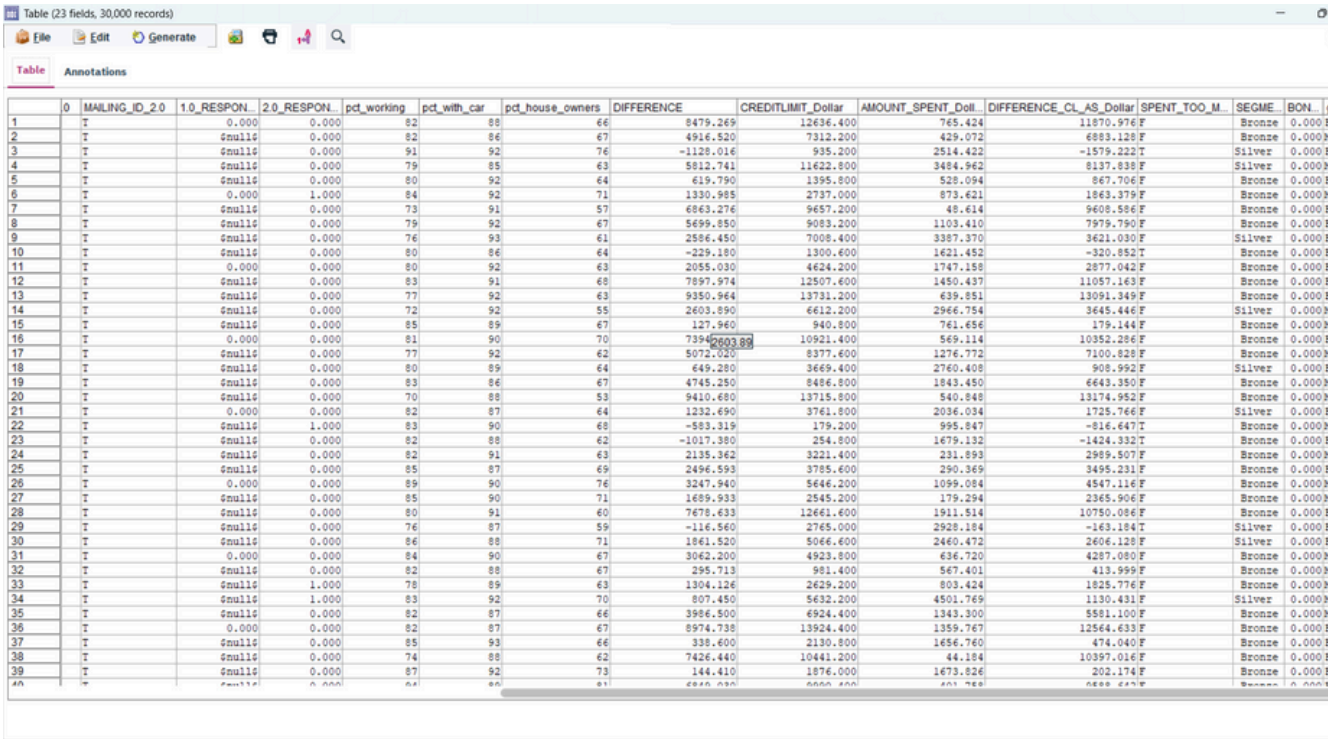
Added Gender node to analyze differences in spending between male and female customers.



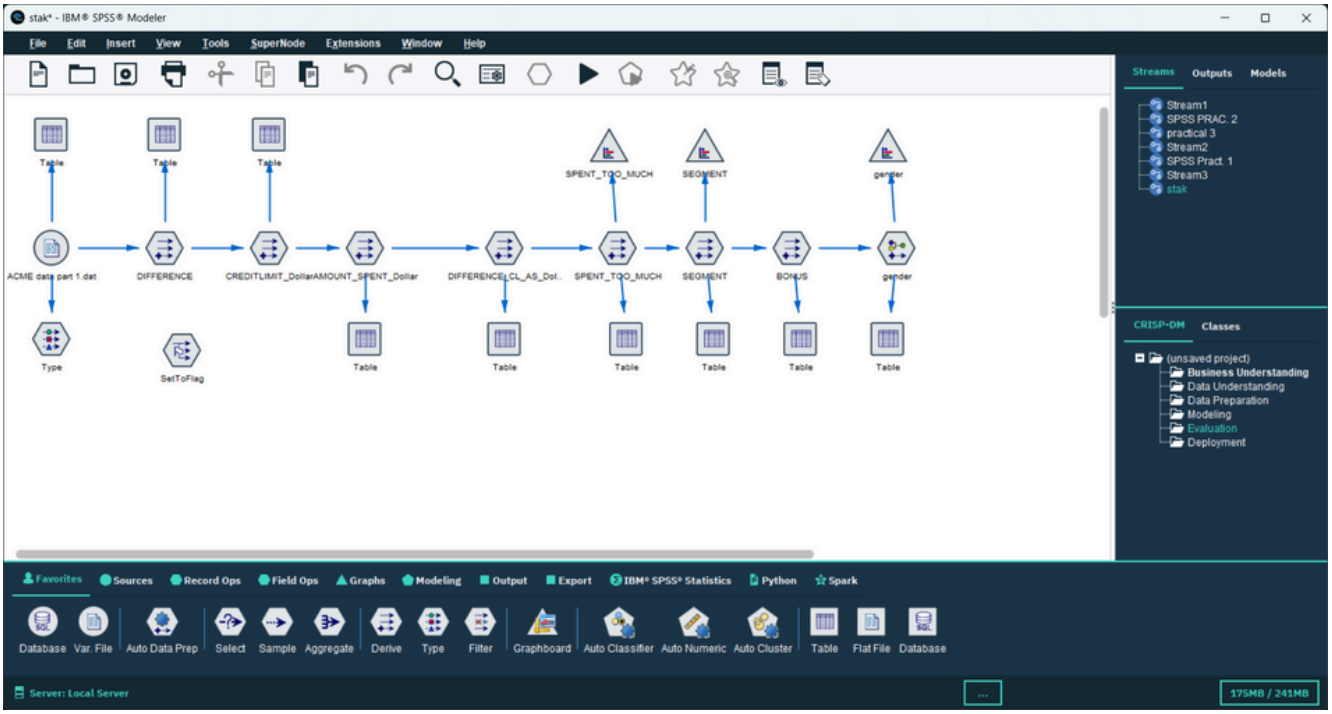


Step 7 : FINAL EVALUTION

- Verified all calculations through Table nodes.
- Checked number of overspending customers and spending gaps.



	0	MAILING_ID_2.0	1.0_RESPON...	2.0_RESPON...	pct_working	pct_with_car	pct_house_owners	DIFFERENCE	CREDITLIMIT_Dollar	AMOUNT_SPENT_Doll...	DIFFERENCE_CL_AS_Dollar	SPENT_TOO_M...	SEGME...	BON...
1		T	0.000	0.000	82	88	66	8479.269	12636.400	765.424	11870.976	F	Bronze	0.000
2		T	$null$	0.000	82	86	67	4916.520	7312.200	429.072	6883.128	F	Bronze	0.000
3		T	$null$	0.000	91	92	76	-1128.016	935.200	2514.422	-1579.222	T	Silver	0.000
4		T	$null$	0.000	79	85	63	5812.741	11622.800	3484.962	8137.838	F	Silver	0.000
5		T	$null$	0.000	80	92	64	619.790	1395.800	528.094	867.706	F	Bronze	0.000
6		T	0.000	1.000	84	92	71	1330.985	2737.000	873.621	1863.379	F	Bronze	0.000
7		T	$null$	0.000	73	91	57	6863.276	9657.200	48.614	9608.586	F	Bronze	0.000
8		T	$null$	0.000	79	92	67	5699.850	9083.200	1103.410	7979.790	F	Bronze	0.000
9		T	$null$	0.000	76	93	61	2586.450	7008.400	3387.370	3621.030	F	Silver	0.000
10		T	$null$	0.000	80	86	64	-229.180	1300.600	1621.452	-320.852	T	Bronze	0.000
11		T	0.000	0.000	80	92	63	2055.030	4624.200	1747.158	2877.042	F	Bronze	0.000
12		T	$null$	0.000	83	91	68	7897.974	12507.600	1450.437	11057.163	F	Bronze	0.000
13		T	$null$	0.000	77	92	63	9350.964	13731.200	639.851	13091.349	F	Bronze	0.000
14		T	$null$	0.000	72	92	55	2603.890	6612.200	2966.754	3645.446	F	Silver	0.000
15		T	$null$	0.000	85	89	67	127.960	940.800	761.656	179.144	F	Bronze	0.000
16		T	0.000	0.000	81	90	70	7394.2603.89	10921.400	569.114	10352.286	F	Bronze	0.000
17		T	$null$	0.000	77	92	62	5072.020	8377.600	1276.772	7100.828	F	Bronze	0.000
18		T	$null$	0.000	80	89	64	649.280	3669.400	2760.408	908.992	F	Silver	0.000
19		T	$null$	0.000	83	86	67	4745.250	8486.800	1843.450	6643.350	F	Bronze	0.000
20		T	$null$	0.000	70	88	53	9410.680	13715.800	540.848	13174.952	F	Bronze	0.000
21		T	0.000	0.000	82	87	64	1232.690	3761.800	2036.034	1725.766	F	Silver	0.000
22		T	$null$	1.000	83	90	68	-583.319	179.200	995.847	-816.647	T	Bronze	0.000
23		T	$null$	0.000	82	88	62	-1017.380	254.800	1679.132	-1424.332	T	Bronze	0.000
24		T	$null$	0.000	82	91	63	2135.362	3221.400	231.893	2989.507	F	Bronze	0.000
25		T	$null$	0.000	85	87	69	2496.593	3785.600	290.369	3495.231	F	Bronze	0.000
26		T	0.000	0.000	89	90	76	3247.940	5646.200	1099.084	4547.116	F	Bronze	0.000
27		T	$null$	0.000	85	90	71	1689.933	2545.200	179.294	2365.906	F	Bronze	0.000
28		T	$null$	0.000	80	91	60	7678.633	12661.600	1911.514	10750.086	F	Bronze	0.000
29		T	$null$	0.000	76	87	59	-116.560	2765.000	2928.184	-163.184	T	Silver	0.000
30		T	$null$	0.000	86	88	71	1861.520	5066.600	2460.472	2606.128	F	Silver	0.000
31		T	0.000	0.000	84	90	67	3062.200	4923.800	636.720	4287.080	F	Bronze	0.000
32		T	$null$	0.000	82	88	67	295.713	981.400	567.401	413.999	F	Bronze	0.000
33		T	$null$	1.000	78	89	63	1304.126	2629.200	803.424	1825.776	F	Bronze	0.000
34		T	$null$	1.000	83	92	70	807.450	5632.200	4501.769	1130.431	F	Silver	0.000
35		T	$null$	0.000	82	87	66	3986.500	6924.400	1343.300	5581.100	F	Bronze	0.000
36		T	0.000	0.000	82	87	67	8974.738	13924.400	1359.767	12564.633	F	Bronze	0.000
37		T	$null$	0.000	85	93	66	338.600	2130.800	1656.760	474.040	F	Bronze	0.000
38		T	$null$	0.000	74	88	62	7426.440	10441.200	44.184	10397.016	F	Bronze	0.000
39		T	$null$	0.000	87	92	73	144.410	1876.000	1673.826	202.174	F	Bronze	0.000



Variable Definitions:

Field Name	Definition	Purpose
CREDITLIMIT_Dollar	Maximum credit allowed to a customer.	To measure spending limit
AMOUNT_SPENT_Dollar	Total money spent by the customer.	To calculate credit utilization
DIFFERENCE_CL_AS_Dollar	Credit limit minus amount spent.	Shows how much is left or overspent.
SPENT_TOO_MUCH	Binary flag (1 = overspent, 0 = within limit).	To identify high-risk customers.
BONUS	Bonus or incentive amount	Used to study bonus impact on spending
GENDER	Customer gender (Male/Female).	Used for gender-based analysis.

Conclusion :

The ACME Credit Card Data Analysis was completed using IBM SPSS Modeler.
By deriving the difference between Credit Limit and Amount Spent, and creating a flag for overspending, we identified customers who spent beyond their limit.
Segmentation and tabular results helped understand spending patterns.
Overall, the project showed how SPSS can effectively analyze and visualize financial data for better decision-making