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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).

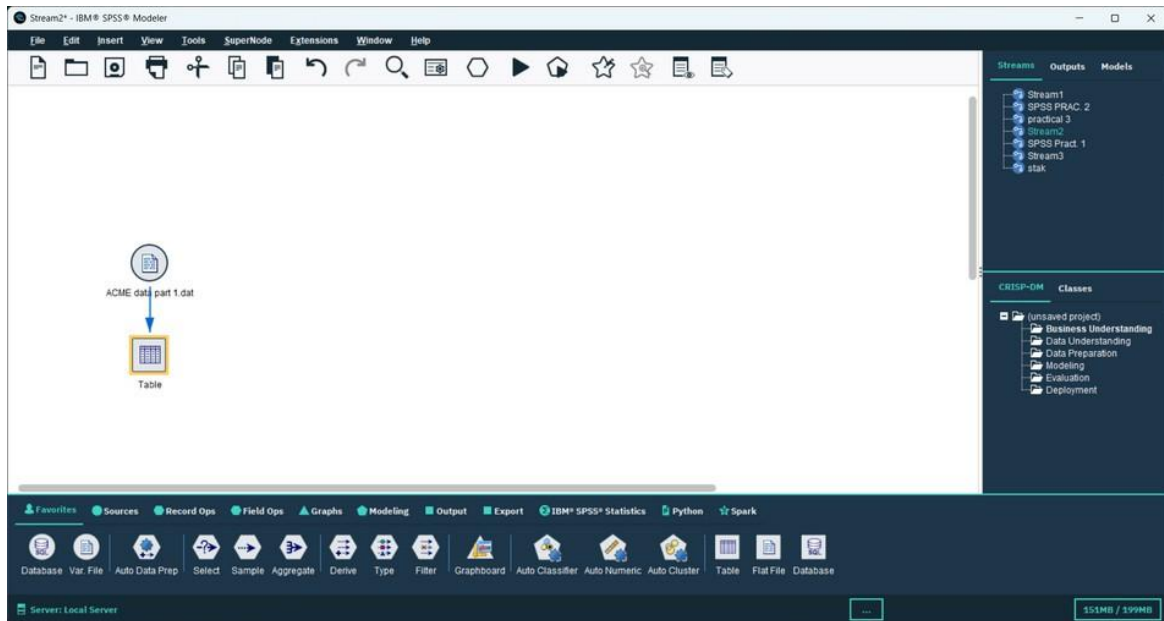
Required Tools

The tool used for this project is IBM SPSS Modeler.

Working

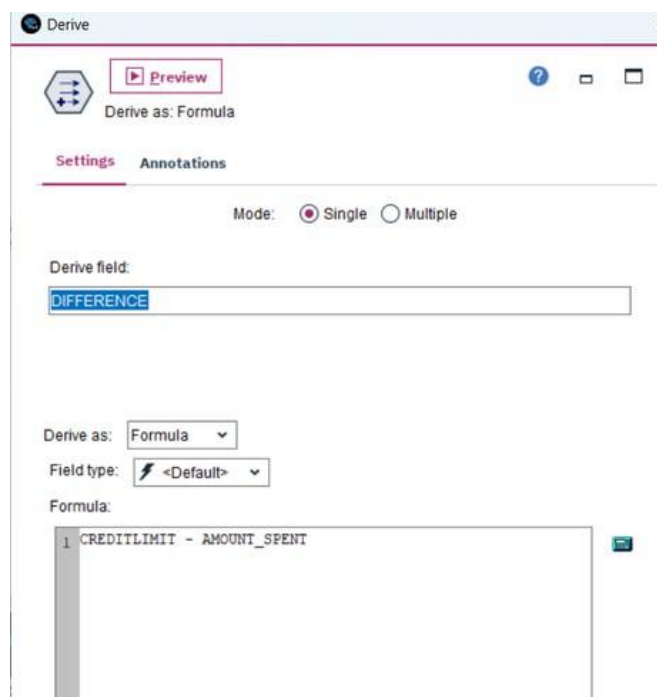
Step 1: Import Data

- ♦ 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:
- ♦ $\text{DIFFERENCE} = \text{CREDITLIMIT_Dollar} - \text{AMOUNT_SPENT_Dollar}$
- ♦ 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.

The screenshot shows the configuration window for the 'SPENT_TOO_MUCH' SetToFlag node. The window has a title bar with the node name and a close button. Below the title bar is a toolbar with a 'Preview' button and a 'Derive as: Flag' label. The 'Settings' tab is active, showing the 'Derive field' as 'SPENT_TOO_MUCH'. The 'Mode' is set to 'Single'. The 'Derive as' dropdown is set to 'Flag'. The 'Field type' is set to 'Flag'. The 'True value' is 'T' and the 'False value' is 'F'. The 'True when' condition is 'AMOUNT_SPENT_Dollar > CREDITLIMIT_Dollar'. The window has 'OK', 'Cancel', 'Apply', and 'Reset' buttons at the bottom.

SPENT_TOO_MUCH

Derive as: Flag

Settings Annotations

Mode: ☒ Single ☐ Multiple

Derive field:

SPENT_TOO_MUCH

Derive as: Flag

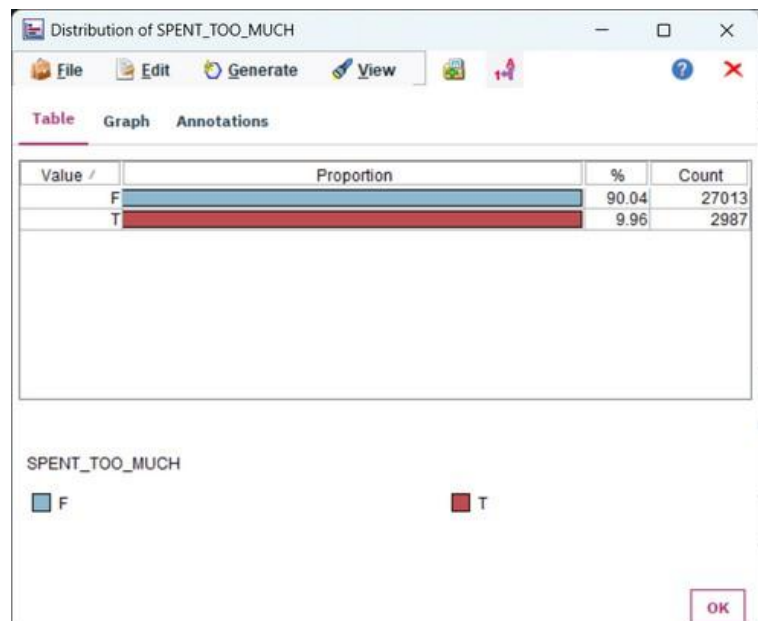
Field type: Flag

True value: T False value: F

True when:

```
1 AMOUNT_SPENT_Dollar > CREDITLIMIT_Dollar
```

OK Cancel Apply Reset



Step 4 : Segment Customers::

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

Preview

Derive as: Nominal

Settings

Annotations

Mode: ☒ Single ☐ Multiple

Derive field:

SEGMENT

Derive as:

Nominal

Field type:

Nominal

Default value:

default

Set field to	If this condition is true
Bronze	AMOUNT_SPENT_Dollar <= 2000
Silver	AMOUNT_SPENT_Dollar > 2000 and AMOUNT_...
Gold	AMOUNT_SPENT_Dollar > 5000

OK

Cancel

Apply

Reset

Distribution of SEGMENT

File

Edit

Generate

View

Table

Graph

Annotations


Value /	Proportion	%	Count
Bronze	<div></div>	87.16	26147
Gold	<div></div>	0.4	119
Silver	<div></div>	12.45	3734

OK

Step 5 : Bonus Analysis:

Added Bonus node to study if bonuses relate to overspending behavior

BONUS



Preview

?

Derive as: Conditional

Settings

Annotations

Mode: ☒ Single ☐ Multiple

Derive field:
BONUS

Derive as: Conditional

Field type: <Default>

If:
1 SEGMENT = "Gold"

Then:
1 AMOUNT_SPENT_Dollar * 0.05

Else:
1 0

OK

Cancel

Apply

Reset

Table (22 fields, 30,000 records)

	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	F	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

OK

Step 6 : Gender Analysis

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

gender

Preview

Settings

Annotations

Mode:

☒ Single

☐ Multiple

Reclassify into:

☒ New field

☐ Existing field

Reclassify field:

GENDER

New field name:

gender

Reclassify values:

Get

Copy

Clear new

Auto...

Original value	New value
F	FEMALE
M	MALE
f	FEMALE
m	MALE

For unspecified values use:

☒ Original value

☐ Default value

undef

OK

Cancel

Apply

Reset

Distribution of gender

File

Edit

Generate

View

Table

Graph

Annotations

Value	Proportion	%	Count
FEMALE	<div></div>	62.18	18654
MALE	<div></div>	37.82	11346

OK

Step 7 : FINAL EVALUTION

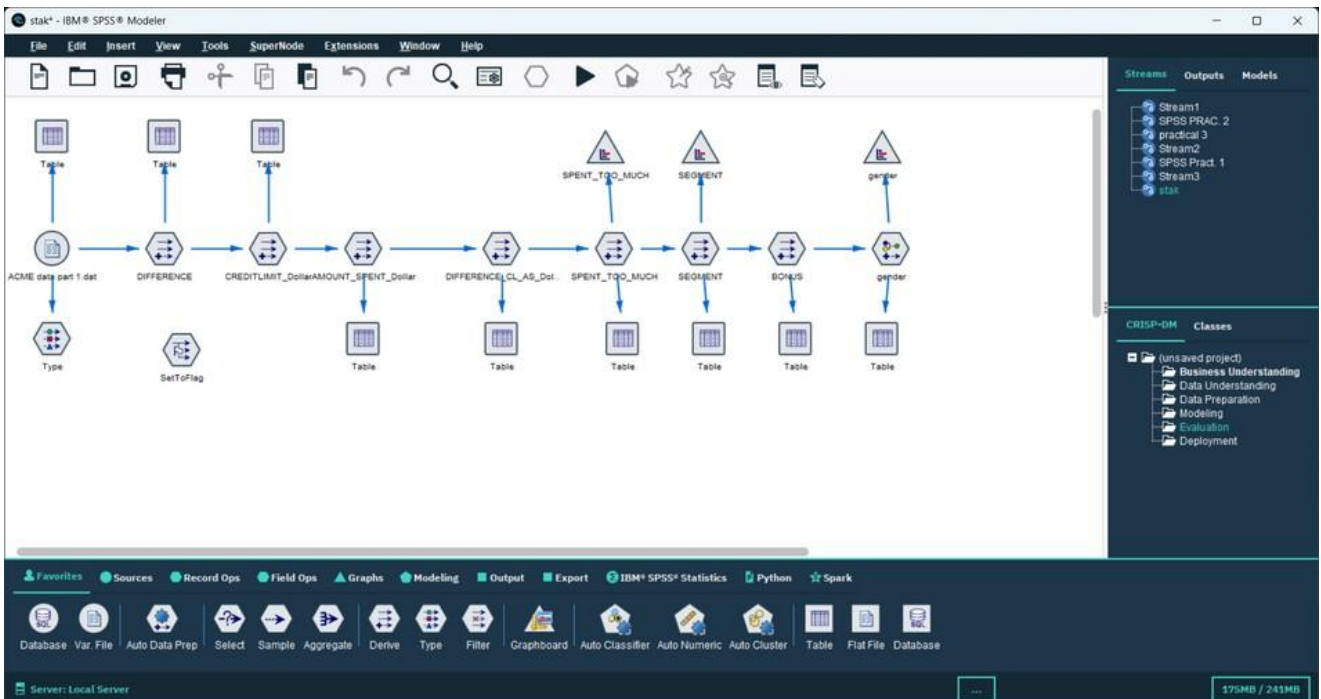
- Verified all calculations through Table nodes.
- Checked number of overspending customers and spending gaps.

Table (23 fields, 30,000 records)

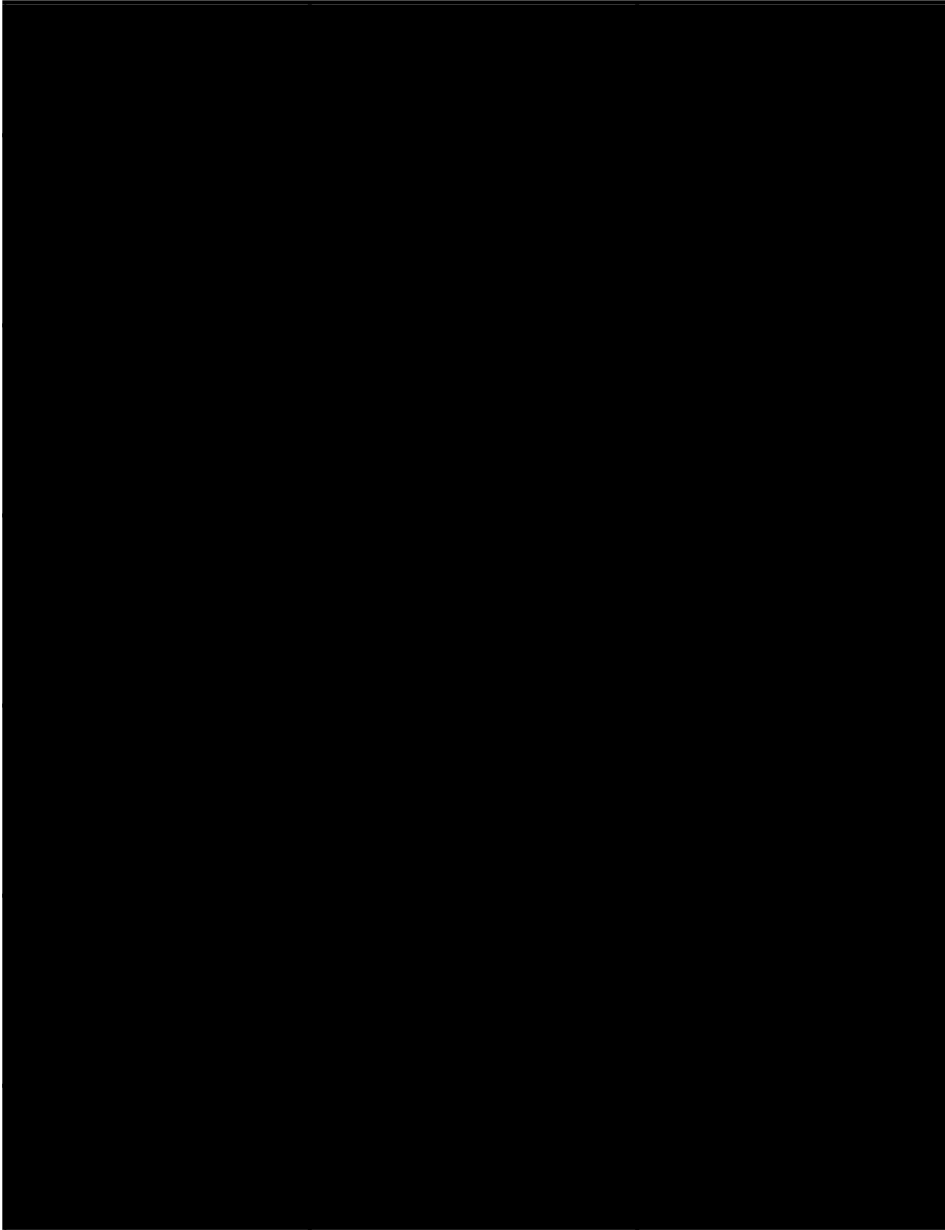
File Edit Generate

Table Annotations

	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	11570.976F		Bronze	0.0001
2	T		0.000	0.000	82	86	67	4916.520	7312.200	429.072	6883.128F		Bronze	0.0001
3	T		0.000	0.000	91	92	76	-1128.016	935.200	2514.422	-1579.222T		Silver	0.0001
4	T		0.000	0.000	79	85	63	5812.741	11622.800	3484.962	8137.838F		Silver	0.0003
5	T		0.000	0.000	80	92	64	619.790	1395.500	528.094	867.706F		Bronze	0.0001
6	T		0.000	1.000	84	92	71	1330.985	2737.000	873.621	1863.379F		Bronze	0.0003
7	T		0.000	1.000	73	91	57	6863.276	9657.200	48.614	9608.586F		Bronze	0.0001
8	T		0.000	0.000	79	92	67	5699.850	9083.200	1103.410	7979.790F		Bronze	0.0001
9	T		0.000	0.000	76	93	61	2894.450	7008.400	3387.370	3621.030F		Silver	0.0001
10	T		0.000	0.000	80	84	64	-229.180	1300.600	1421.452	-320.852T		Bronze	0.0001
11	T		0.000	0.000	80	92	63	2055.030	4624.200	1747.158	2677.042F		Bronze	0.0001
12	T		0.000	0.000	83	91	68	7897.974	12507.600	1450.437	11057.163F		Bronze	0.0001
13	T		0.000	0.000	77	92	63	9350.964	13731.200	639.851	13091.349F		Bronze	0.0001
14	T		0.000	0.000	72	92	55	2603.890	6612.200	2966.754	3645.446F		Silver	0.0003
15	T		0.000	0.000	85	89	67	127.960	940.800	761.656	179.144F		Bronze	0.0003
16	T		0.000	0.000	81	90	70	7394.2603.89	10921.400	569.114	10352.286F		Bronze	0.0001
17	T		0.000	0.000	77	92	62	5072.020	8377.600	1276.772	7100.828F		Bronze	0.0001
18	T		0.000	0.000	80	89	64	649.280	3669.400	2760.405	908.992F		Silver	0.0001
19	T		0.000	0.000	83	86	67	4745.250	8486.500	1843.580	6643.350F		Bronze	0.0003
20	T		0.000	0.000	88	93	53	9410.800	13715.800	540.948	13174.952F		Bronze	0.0003
21	T		0.000	0.000	82	87	64	1232.690	3761.500	2036.034	1725.766F		Silver	0.0001
22	T		0.000	1.000	83	90	68	-583.319	179.200	955.847	-816.647T		Bronze	0.0003
23	T		0.000	0.000	82	88	62	-1017.380	254.800	1679.132	-1424.332T		Bronze	0.0001
24	T		0.000	0.000	82	91	63	2135.362	3221.400	231.893	2989.507F		Bronze	0.0003
25	T		0.000	0.000	85	87	69	2496.593	3785.600	290.369	3495.231F		Bronze	0.0001
26	T		0.000	0.000	89	90	76	3247.940	5646.200	1099.084	4547.116F		Bronze	0.0003
27	T		0.000	0.000	85	90	71	1689.933	2545.200	179.294	2365.906F		Bronze	0.0003
28	T		0.000	0.000	80	91	60	7678.633	12661.600	1911.514	10750.086F		Bronze	0.0001
29	T		0.000	0.000	76	87	59	-116.560	2785.000	2928.184	-163.184T		Silver	0.0001
30	T		0.000	0.000	86	88	71	1861.520	5066.600	2460.472	2606.128F		Silver	0.0001
31	T		0.000	0.000	84	90	67	3062.200	4923.800	636.720	4287.000F		Bronze	0.0003
32	T		0.000	0.000	82	88	67	295.713	981.400	567.401	613.999F		Bronze	0.0003
33	T		0.000	1.000	78	89	63	1304.126	2629.200	803.424	1625.776F		Bronze	0.0003
34	T		0.000	1.000	83	92	70	807.450	5632.200	4501.769	1130.431F		Silver	0.0003
35	T		0.000	0.000	82	87	66	3986.500	6924.400	1343.300	5581.100F		Bronze	0.0001
36	T		0.000	0.000	82	87	67	5974.738	13924.400	1359.767	12564.633F		Bronze	0.0003
37	T		0.000	0.000	85	93	66	338.600	2130.800	1656.760	474.040F		Bronze	0.0001
38	T		0.000	0.000	74	88	62	7426.440	10441.200	44.184	10397.016F		Bronze	0.0001
39	T		0.000	0.000	87	92	73	144.410	1876.000	1673.526	202.174F		Bronze	0.0001
40	T		0.000	0.000	84	92	61	2288.290	5898.400	293.780	5600.210F		Bronze	0.0001



Variable Definitions:



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