Business Analytics

Assignment 1

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1. SASHELP.CARS

Alphabetic List of Variables and Attributes

#	Variable	Type	Len	Format	Label
9	Cylinders	Num	8		
5	DriveTrain	Char	5		
8	EngineSize	Num	8		Engine Size (L)
10	Horsepower	Num	8		
7	Invoice	Num	8	DOLLAR8.	
15	Length	Num	8		Length (IN)
11	MPG_City	Num	8		MPG (City)
12	MPG_Highway	Num	8		MPG (Highway)
6	MSRP	Num	8	DOLLAR8.	
1	Make	Char	13		
2	Model	Char	40		
4	Origin	Char	6		
3	Type	Char	8		
13	Weight	Num	8		Weight (LBS)
14	Wheelbase	Num	8		Wheelbase (IN)

Sort Information

Sortedby	Make Type
Validated	YES
Character Set	ANSI

Assume suitable values for input and state it explicitly.

A) Predict the output of the following code :

```
proc freq data=sashelp.cars;
tables Origin Type DriveTrain;run;
```

The FREQ Procedure

Origin	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Asia	158	36.92	158	36.92
Europe	123	28.74	281	65.65
USA	147	34.35	428	100.00

Type	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Hybrid	3	0.70	3	0.70
SUV	60	14.02	63	14.72
Sedan	262	61.21	325	75.93
Sports	49	11.45	374	87.38
Truck	24	5.61	398	92.99
Wagon	30	7.01	428	100.00

DriveTrain	Frequency	Percent	Cumulative Frequency	Cumulative Percent
All	92	21.50	92	21.50
Front	226	52.80	318	74.30
Rear	110	25.70	428	100.00

B) Convert the code above to 2-way Frequency and 3-wayFrequency.

Ans: 2-way Frequency

```
proc Freq data=Sashelp.cars;
tables Origin * Type;
tables Origin * DriveTrain;
tables DriveTrain * Type;
run;
```

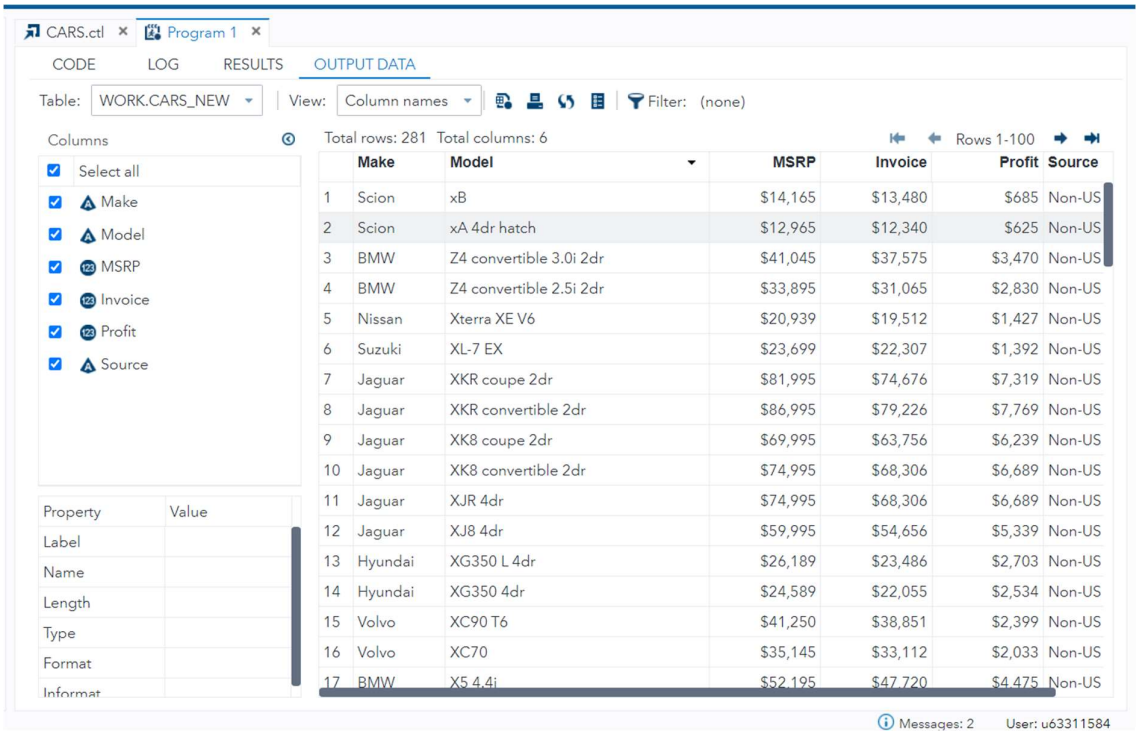
3-wayFrequency:

```
proc Freq data=Sashelp.cars;
tables Origin * DriveTrain;
run;
```

2. Predict the output of the following code :data cars_new;
set sashelp.cars;
where Origin ne "USA"; Profit = MSRP-Invoice;Source = "Non-US Cars";
format Profit dollar10.;
keep Make Model MSRP Invoice Profit Source;run;

Assume suitable values for input and state it explicitly.

Ans:



3. With a use case clearly differentiate and explain the following:

Ans:

1) **Business Analytics:**

Business analytics (BA) is a set of disciplines and technologies for solving business problems using data analysis, statistical models and other quantitative methods. It involves an iterative, methodical exploration of an organization's data, with an emphasis on statistical analysis, to drive decision-making.

Data-driven companies treat their data as a business asset and actively look for ways to turn it into a competitive advantage. Success with business analytics depends on data quality, skilled analysts who understand the technologies and the business, and a commitment to using data to gain insights that inform business decisions.

2) **Descriptive Analytics:**

Descriptive analytics is the analysis of historical data using two key methods – data aggregation and data mining - which are used to uncover trends and patterns. Descriptive analytics is not used to draw inferences or make predictions about the future from its findings; rather it is concerned with representing what has happened in the past.

Descriptive analytics are often displayed using visual data representations like line, bar and pie charts and, although they give useful insights on its own, often act as a foundation for future analysis. Because descriptive analytics uses fairly simple analysis techniques, any findings should be easy for the wider business audience to understand.

For this reason, descriptive analytics form the core of the everyday reporting in many businesses. Annual revenue reports are a classic example of descriptive analytics, along with other reporting such as inventory, warehousing and sales data, which can be aggregated easily and provide a clear snapshot of a company’s operations. Another widely used example is social media and Google Analytics tools, which summarise certain groupings based on simple counts of events like clicks and likes.

Whilst descriptive data can be useful to quickly spot trends and patterns, the analysis has its limitations. Viewed in isolation, descriptive analytics may not give the full picture. For more insight, you need delve deeper.

3) **Predictive Analytics:**

Predictive analytics is a more advanced method of data analysis that uses probabilities to make assessments of what could happen in the future. Like descriptive analytics, prescriptive analytics uses data mining – however it also uses statistical modelling and machine learning techniques to identify the likelihood of future outcomes based on historical data. To make predictions, machine learning algorithms take existing data and attempt to fill in the missing data with the best possible guesses.

These predictions can then be used to solve problems and identify opportunities for growth. For example, organisations are using predictive analytics to prevent fraud by looking for patterns in criminal behaviour, optimising their marketing campaigns by spotting opportunities for cross selling and reducing risk by using past behaviours to predict which customers are most likely to default on payments.

Another branch of predictive analytics is deep learning, which mimics human decision-making processes to make even more sophisticated predictions. For example, through using multiple levels of social and environmental analysis, deep learning is being used to more accurately

predict credit scores and, in the medical field, it is being used to sort digital medical images such as MRI scans and X-rays to provide an automated prediction for doctors to use in diagnosing patients.

4) **Prescriptive Analytics:**

Whilst predictive analytics shows companies the raw results of their potential actions, prescriptive analytics shows companies which option is the best.

The field of prescriptive analytics borrows heavily from mathematics and computer science, using a variety of statistical methods.

Although closely related to both descriptive and predictive analytics, prescriptive analytics emphasises actionable insights instead of data monitoring. This is achieved through gathering data from a range of descriptive and predictive sources and applying them to the decision-making process. Algorithms then create and re-create possible decision patterns that could affect an organisation in different ways.

What makes prescriptive analytics especially valuable is their ability to measure the repercussions of a decision based on different future scenarios and then recommend the best course of action to take to achieve a company's goals.

The business benefit of using prescriptive analytics is huge. It enables teams to view the best course of action before making decisions, saving time and money whilst achieving optimal results.

Businesses that can harness the power of prescriptive analytics are using them in a variety of ways. For example, prescriptive analytics allow healthcare decision-makers to optimise business outcomes by recommending the best course of action for patients and providers. They also enable financial companies to know how much to reduce the cost of a product to attract new customers whilst keeping profits high.