

UIS 3RD ANALYTICS HOUSE CUP

Variable Explanations:

gvkey: Unique number key assigned to each company in the dataset.

year: Financial situation in that specific year.

CompanyName: Different companies' names

Liabilities: Total debts (i.e., a sum of money) that a company owes in a specific year (unit: million dollars).

Sales: Sum of the exchange of products, commodity, service, or delivery (unit: million dollars).

AdvertisingExpense: The expenditure of advertisements run during the specific period (unit: million).

ResearchandDevelopmentExpense: The expenditure of research and development of product and service during the specific period (unit: million).

SellingGeneralandAdministrat: The expenditure of all direct and indirect selling costs, operational costs, and administrative expenses during the specific period (unit: million).

ActiveInactiveStatusMarker: "A" represents the company is still active during that specific period; "I" represents the company is no longer active during that specific period.

SIC: Standard industrial classification code that categorize the industries that companies belong to. More SIC information can be found at: <https://www.osha.gov/data/sic-search>

Significance Level: p value has to be less than 5%

Questions:

1. What are the top 5% industries that have most **research and development (R&D)** spending in the year of 2021? What implications can you provide for managers? (10 points)
2. By using visual demonstration (e.g., table and/or graph), what are the **advertising and R&D** expenditure trends over time for Radio and Television Broadcasting and Communication industry (standard industrial classification code, SIC: 3663)? (10 points)
3. If you have recently joined the marketing intelligence team at Advanced Micro Devices (gvkey: 1161). Your supervisor has asked you to perform a comprehensive analysis to assess:

(a) How effectively AMD has translated advertising spending into sales growth between 2019 and 2021.

(b) How AMD's advertising efficiency compares to peers in the semiconductor industry (SIC: 3674).

(c) What are the recommendations to the marketing team?

(20 points for all three questions above)

4. Can you come up with a measure for customer satisfaction based on the existing data? Briefly explain the reasons for your method and managerial implications. (20 points)

(hint: this is an open question; anything that relates to advertising/R&D/sales, etc can be accepted)

5. As a Director of Advertising for **American Airline Group Inc** (gvkey: 1045), you want to increase the advertising budget for your airlines. Thus, you need to present an advertising budget proposal to your Board but to do so you need to run a 'competitive analysis'. (40 points)

The data provides liabilities, sales, and advertising expense for 4 air transportation companies - American Airlines Group Inc (gvkey: 1045), Alaska Air Group (gvkey: 1230), United Airlines (gvkey: 10795), and Delta Airlines (gvkey: 3851).

Run a competitive analysis to compare the liabilities, sales, and advertising expense for all the 4 Air Transportation Companies. Based on the analyses:

- Which of the air transportation company is ranked highest on sales?
- Which of the air transportation company is spending the highest dollar amount on advertising?
- Which of the air transportation company has the highest liability? Should this be a worry for American Airline Group Inc.? Why/why not?

You further want to understand if there is a relationship between advertising and sales and thus run correlation analyses across all the 4 air transportation companies. Should you be concerned with the results? Why/why not.

Based on the above analyses and given your role as Director of Advertising for American Airlines Group Inc., what recommendations would you be giving to the Board?

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