



Homework #3

Richest Americans Problem

Background Information

Each year since 1982, *Forbes* magazine has compiled a list of the 400 richest people in America as ranked by their net worth, the value of all assets (cash, stocks, properties) owned by the person minus any debt. As of 2023, all 400 individuals are billionaires with the wealthiest, Elon Musk, having a net worth estimated at \$250 billion [1].

Members of the *Forbes 400* derive their net worth from a variety of sources. A number have earned their wealth from high tech businesses, with the founders of Microsoft, Amazon, Facebook, Google, and Oracle holding seven of the top ten positions. Many have successfully built their own businesses, while others have inherited their wealth [1].



Altogether, the \$4.5 trillion of combined wealth from members of the *Forbes 400* list represents about 2.9% of the total wealth of America [2].

Problem Statement

In this assignment, students will explore *Forbes 400* data to explore patterns with the listed individuals, where they live, and their philanthropic giving.

Instructions

IMPORTANT: This assignment requires the Windows version of Microsoft 365. macOS users can access a ready-to-use version through Windows Virtual Desktop by following the instructions at <https://cs101.wvu.edu/wvd>.

IMPORTANT: Complete the steps below in the order they are given. Completing the steps out of order may complicate the assignment or result in an incorrect result.



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1. Download and extract the provided Data Files ZIP file. It contains the following files for use in this assignment:
 - a. **people.xml** – List of people on the *Forbes 400* list for 2023 [1].

Table: People		
Field Name	Type	Description
Name	Short Text	Primary key. Name of the listed person(s).
Rank	Number	Rank of person on list, where #1 is the wealthiest person. There may be ties.
NetWorth	Currency	Estimated net worth of the person.
Age	Number	Age of the person.
StateAbbrv	Short Text	Abbreviation of state where person resides. Value UNK used if unknown.
WealthSource	Short Text	Source of wealth.
GivingCode	Number	Code representing the amount of wealth the person has given away.

- b. **states.xml** – Information on the states and territories, their population, and households estimates for 2022 [3]. Some data is not available for territories.

Table: States		
Field Name	Type	Description
StateAbbrv	Short Text	Primary key. Postal abbreviation for the state.
StateName	Short Text	Full name of the state.
Population	Number	Census population estimate.
Households	Number	Census estimated number of households.
HouseholdIncome	Currency	Median household income.
HouseholdNetWorth	Currency	Median household net worth.

2. Create a new Microsoft Access database named **hw3_lastname_firstname_rap.accdb**.
3. Import the following items into the database:
 - a. **people.xml** file – Import structure and data into a new table.
 - b. **states.xml** file – Import structure and data into a new table.



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4. We need to create a new table to store information about the philanthropic gifts of each person.
- Create a table named *Giving* with the fields below. Use appropriate field types and designate a good primary key.

Table: Industries	
Field Name	Description
GivingCode	Code presenting the amount of the person's wealth that has been given away.
GivingDescription	Description of the amount of the person's wealth that has been given away.

- Enter records for all categories below [4].

HINT: The *Giving* table will contain 6 records.

GivingCode	GivingDescription
0	Unknown
1	Less than 1% of wealth
2	1%-4.99% of wealth
3	5%-9.99% of wealth
4	10%-19.99% of wealth
5	20% or more of wealth

5. Create the appropriate relationships for the following tables. Do not enforce referential integrity.
- States* and *People*
 - Giving* and *People*
6. Create separate queries to provide the information requested below. Name each query after the step in which it appears (e.g., name the query in Step 6a as *Query6a*).

HINT: Run your queries to test them. Make sure that they display all and only the records that you would expect to appear.

- Create a query to display information about all people on the *Forbes 400* list. List each person's name, net worth, rank, state name, and description of their giving.

Sort by rank in ascending order.

HINT: This query will show 400 records and 5 fields.



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- b. We want to view information about people from California in the list. Create a query listing each person's name, state name, source of their wealth, and net worth.

Only display records for people from California.

Sort by source of wealth in ascending order and then by net worth in descending order.

HINT: This query will show 87 records and 4 fields.

- c. Create a query to find information on people whose wealth is from cryptocurrency or who are, at most, 40 years old. List the person's rank, name, age, net worth, and source of their wealth.

Only display records for people whose source of wealth was cryptocurrency or whose age is no more than 40 (≤ 40).

Sort by rank and then by name, both in ascending order.

HINT: This query will show 8 records and 5 fields.

- d. We wish to calculate the total household net worth for each state. Create a query listing the state name, population, number of households, and median household net worth. Also, include a field that calculates the total household net worth for each state.

You can calculate the total household net worth using the formula:

$$[States.Households] * [States.HouseholdNetWorth]$$

Format the calculated field as currency with no decimal places.

HINT: This query will show 56 records and 5 fields.



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- e. Create a query to calculate the percentage of their home state's total household net worth that each *Forbes 400*-listed person is worth. List each person's name, net worth, and state name. Also, include a field that calculates the percentage of state total household net worth represented by the person.

You can calculate the percentage of state total household net worth using the formula:

$$\frac{[People.NetWorth]}{([States.Households] * [States.HouseholdNetWorth])}$$

Only display records for people worth at least 1% (≥ 0.01) of their state's total net worth.

Format the calculated field as a percentage with 1 decimal place.

HINT: This query will show 68 records and 4 fields.

- f. We wish to summarize data about each giving category. Create a query listing, for each giving category code and giving category description, the count of *Forbes 400*-listed people, their average age, the sum of their net worth, and their average net worth.

Format the average age as a standard-type number with no decimal places. Format the average of net worth and sum of net worth both as currency with no decimal places.

HINT: This query will show 6 records and 5 fields.



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- g. We wish to determine the prevalence of *Forbes 400*-listed people in each state. Copy-and-paste this SQL code into a new query:

```
SELECT States.StateName, States.Population, Count(People.Name)
AS ForbesListPeople,
Round(Count([Name])/[Population]*1000000,2) AS
ForbesListPeoplePerMillionResidents
FROM States LEFT JOIN People ON States.StateAbbrev =
People.StateAbbrev
GROUP BY States.StateName, States.Population, States.StateName
HAVING States.Population Is Not Null
ORDER BY Round(Count([Name])/[Population]*1000000,2) DESC ,
States.StateName;
```

IMPORTANT: Do not make any modifications to the query other than entering the above SQL code.

HINT: This query will show 51 records and 4 fields.

7. We need to create a new table to store analysis questions responses.
- Create a table named *AnalysisQuestions* with the fields below. Use appropriate field types and designate a good primary key.

Table: AnalysisQuestions

Field Name	Description
QuestionNumber	Question being answered.
Response	Response to the analysis question prompt.

8. In the *AnalysisQuestions* table, answer three of the five analysis questions below. Respond to one question per record.
- Are there any noticeable patterns in the age of people on the *Forbes 400* list? Why might this be the case?
 - There are several families that appear on the *Forbes 400* list. Identify one such family. List their family name, the source of their wealth, and how you think they got to be on the list.
 - Why are most of the listed people whose wealth was from oil located in Texas and Oklahoma?
 - About 20% of the people on the *Forbes 400* list earned their wealth from sources related to the finance industry. Why might this industry be so heavily represented?
 - Other than earning additional income or spending more money, what might cause a person's net worth to change?
9. Run the Compact and Repair Database utility on your database. Ignore any errors you receive when running the utility.



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Grading Rubric

This assignment is worth 60 points. It will be graded by your instructor using this rubric, with partial credit awarded as appropriate:

Step 3	3 points	Steps 6a-g	5 points each
Steps 4a-b	5 points total	Step 7a	3 points
Step 5	3 points	Steps 8a-e (pick 3 of 5)	3 points each

The analysis questions in Steps 8a-e will be evaluated using this rubric:

Standard	Meets Requirements (1.5 points)	Does Not Meet Requirements (0 points)
Answer is reasonable.	Answer addresses the question prompt and is factually correct or a reasonable interpretation of available data.	Answer does not address the question prompt, is factually incorrect, or is an unreasonable interpretation of available data.
Answer is supported.	Logical rationale is provided to support the given answer.	Logical rationale is not provided to support the given answer.

Acknowledgments

The image in the introduction appears courtesy of *Forbes* magazine [5].

References

- [1] "Forbes 400," *Forbes*, 2023. Available: <https://www.forbes.com/forbes-400/>.
- [2] "Household net worth reaches new high," *KPMG*, Mar. 12, 2024. Available: <https://kpmg.com/us/en/articles/2024/q4-2023-household-net-worth.html>.
- [3] "American Community Survey 1-Year Data (2005-2022)," U.S. Census Bureau, Sep. 14, 2023. Available: <https://www.census.gov/data/developers/data-sets/acs-1year.html>.
- [4] P. Liu, "The Forbes Philanthropy Score 2023: How Charitable Are The Richest Americans?," *Forbes*. Available: <https://www.forbes.com/sites/phoebeliu/2023/10/03/the-forbes-philanthropy-score-2023-how-charitable-are-the-richest-americans/>. Accessed: Aug. 02, 2024.
- [5] L. Kroll, "The Forbes 400: The Richest People in America," *Forbes*, Sep. 12, 2012, Available: <https://www.forbes.com/sites/luisakroll/2012/09/19/the-forbes-400-the-richest-people-in-america/>.