Advanced Topics in Databases

1st Deliverable

Demertzoglou Efstratios | TH20580

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The csv files I will be working with

The universal table that will be examined in this assignment is a combination of the *circuits.csv*, *races.csv* and *results.csv* files.

The final table was modified to my preference in order to provide the necessary data to find the correlation between a circuit's altitude and an engine failure occurrence.

UNIVERSAL(circuitId, raceId, resultId, statusId, alt)

Functional dependencies:

From the table:

UNIVERSAL(circuitId, raceId, resultId, statusId, alt)

1. circuitId -> alt
2. raceId, resultId -> raceId
3. raceId, resultId -> statusId
4. raceId -> circuitId

From 1 and 4 : raceId -> alt [5]

From 2 and 5: raceId, resultId -> alt [6]

Combining 3 and 6:

raceId, resultId -> statusId, alt

Initial Relational Schema

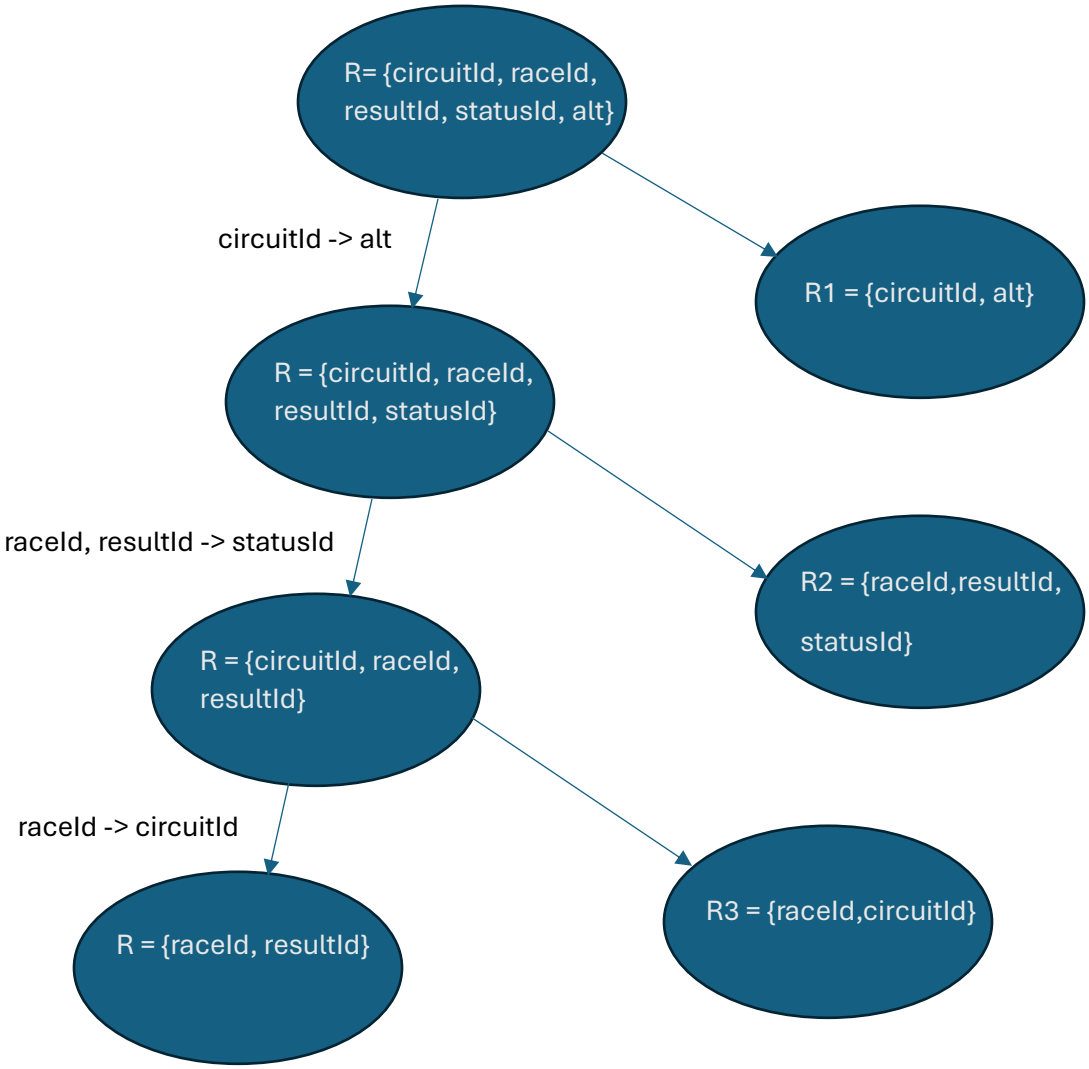
```
DROP TABLE IF EXISTS RESULTS CASCADE;
DROP TABLE IF EXISTS RACES CASCADE;
DROP TABLE IF EXISTS CIRCUITS CASCADE;

CREATE TABLE CIRCUITS(
circuitid INT NOT NULL,
alt INT NOT NULL,
PRIMARY KEY(circuitid));
COPY CIRCUITS FROM 'C:\uni\8x\ATD\archive\circuits_modified.csv' DELIMITER ',' CSV HEADER;

CREATE TABLE RACES (
raceid INT NOT NULL,
circuitid INT NOT NULL,
FOREIGN KEY (circuitid) REFERENCES CIRCUITS (circuitid),
PRIMARY KEY (raceid));
COPY RACES FROM 'C:\uni\8x\ATD\archive\races_modified.csv' DELIMITER ',' CSV HEADER;

CREATE TABLE RESULTS (
raceid INT NOT NULL,
resultid INT NOT NULL,
statusid INT NOT NULL,
FOREIGN KEY (raceid) REFERENCES RACES (raceid),
PRIMARY KEY(resultid,raceid));
COPY RESULTS FROM 'C:\uni\8x\ATD\archive\results_modified.csv' DELIMITER ',' CSV HEADER;
```

By creating a natural join between these 3 tables as:

“*SELECT * FROM CIRCUITS NATURAL JOIN RACES NATURAL JOIN RESULTS*”

The output projected should be the same to “*SELECT * FROM UNIVERSAL*”

Propose a Joinless Decomposition



Link to all necessary CSVs and sql scripts:

https://drive.google.com/drive/folders/1yacDgZtzWD_Lltk9rEIU2C8BbS9Rkjrf?usp=sharing