A logo of a book and tree

Description automatically generated

Advanced Topics in Databases

1st Deliverable

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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

R = {raceId, resultId}

raceId -> circuitId

R3 = {raceId,circuitId}

R = {circuitId, raceId, resultId}

circuitId -> alt

raceId, resultId -> statusId

R = {circuitId, raceId, resultId, statusId}

R2 = {raceId,resultId,

statusId}

R1 = {circuitId, alt}

R= {circuitId, raceId, resultId, statusId, alt}

Link to all necessary CSVs and sql scripts:

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