SQL Report: Your title goes here

Your Name

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An abstract is absolutely not necessary and you can simply drop or comment this part. Alternatively, you can use it to place your contact details:

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1 Temperature indices

1.1 SQL code

An overview of temperature indices was implemented using a `VIEW` as defined in lising 1

Listing 1: create statement for view

```
-- Script for calculating indices for every time series measured this year

-- calculating mean temperature for the whole time series

DROP VIEW IF EXISTS mean_temperature;
CREATE VIEW mean_temperature AS
SELECT avg(data.value) AS t_avg,
    d.device_id AS hobo_id
FROM (data
JOIN metadata d ON ((data.meta_id = d.id)))
WHERE (d.term_id = 11)
GROUP BY d.device_id
ORDER BY d.device_id;
SELECT * FROM mean_temperature;

-- calculating mean day temperature t_d

DROP VIEW IF EXISTS mean_day_temperature CASCADE;
CREATE VIEW mean_day_temperature AS
SELECT
        avg(data.value) as t_d,
        d.device_id as HOBO_ID
FROM data
JOIN metadata d ON data.meta_id=d.id
WHERE d.term_id=11
```

```
AND (EXTRACT(HOUR FROM data.tstamp) >= 6)
AND (EXTRACT(HOUR FROM data.tstamp) < 18)
GROUP BY d.device_id
ORDER BY d.device_id ASC;
SELECT * FROM mean_day_temperature;

-- calculating mean night temperature t_n

DROP VIEW IF EXISTS mean_night_temperature CASCADE;
CREATE VIEW mean_night_temperature AS
SELECT
        avg(data.value) as t_n,
        d.device_id as HOBO_ID
FROM data
JOIN metadata d ON data.meta_id=d.id
WHERE d.term_id=11
AND (EXTRACT(HOUR FROM data.tstamp) <= 5)
OR (EXTRACT(HOUR FROM data.tstamp) >=18)
GROUP BY d.device_id
ORDER BY d.device_id ASC;
SELECT * FROM mean_night_temperature;

-- calculating the Difference between mean day and night temperature t_nd

DROP VIEW IF EXISTS diff_mean_daynight CASCADE;
CREATE VIEW diff_mean_daynight AS
SELECT
        d.t_d,
        d.hobo_id,
        n.t_n,
        (d.t_d-n.t_n) as t_nd
FROM mean_day_temperature d
JOIN mean_night_temperature n ON d.hobo_id=n.hobo_id;
SELECT * FROM diff_mean_daynight;

-- putting all views in one indices table and viewing whole table

DROP TABLE IF EXISTS indices CASCADE;
CREATE TABLE indices AS
SELECT
        diff.hobo_id, t_d, t_n, t_nd,
       m.t_avg
FROM diff_mean_daynight diff
JOIN mean_temperature m ON diff.hobo_id=m.hobo_id;
SELECT * FROM indices;
```

1.2 discuss

In the next paragraph discuss the differences between the Postgres and R solution for calculating temperature indices. Name a few advantages **and** disadvantages for both solutions.

2 Verify results

Compare your SQL calculated indices to the R calculated indices. Do they differ and if they do, why?

3 Spatial variability

Describe the variability of your sensor compared to the others this year. You might also want to place some citations. Check out the comments in the source `main.tex` for the commands. If you want to cite your HOBO report here, add an bibliography entry to the `bibliography.bib` like:

```
@article{hobo,
    author={Bar Foo},
    year=2021,
    journal={Data collection, -management, -visualization lecture},
    title={HOBO Report}
}
```

You can cite it with the `\citep{hobo}` command (Foo, 2021).

4 Indices across time and space

This last section should focus on the question how this years' measurements compare to the last few years. For this, you are asked to produce a number of graphs. The best practice is to generate PDF graphics and include them directly here. The necessary commands are already loaded in this template.

You can even automate your workflow further and run your scripts producing the PDFs in this repository, saving them to the `'./figures/'` subfolder. This will refresh the figures in the report whenever, your scripts overwrite them (Fig 1).

The figure above can be included like:

```
\begin{figure}[ht]
    \centering
    \includegraphics[width=.5\textwidth]{./figures/example_analysis}
    \caption{Boxplot of the mean, minimum and maximum hourly, quality
    checked air temperature in Freiburg on Christmas eve. The data was
    taken from 52 different locations in 2019, 2020 and 2021. Original
    measurements were taken with an onset HOBO temperature data logger.}
    \label{fig:first_figure}
\end{figure}
```

References

B. Foo. Hobo report. *Data collection, -management, -visualization lecture*, 2021.

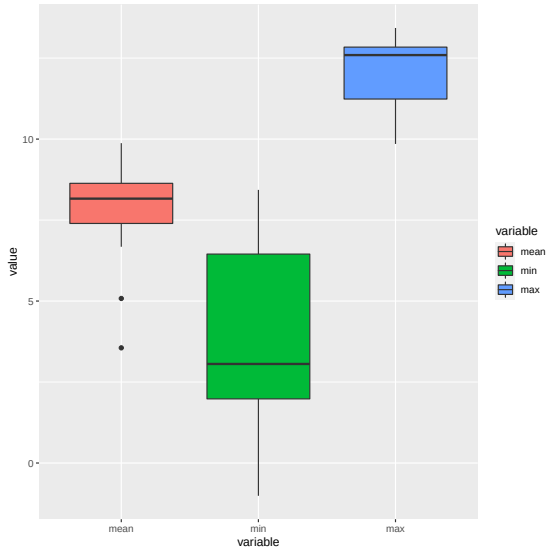

Figure 1: Boxplot of the mean, minimum and maximum hourly, quality checked air temperature in Freiburg on Christmas eve. The data was taken from 52 different locations in 2019, 2020 and 2021. Original measurements were taken with an onset HOBO temperature data logger.