Bayerische Landtagswahl Pflichtenheft

DatenbankSysteme (Prof. Kemper)
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Objective

This software stores and manages data from Bavarian Parliamentary elections. It can be used to view and analyze the results from a given election and to compare data between elections.

“Must”-Criteria

1. The system must have the capacity to store tens of millions of vote records. For example, more than 13.5 million votes were cast in the 2018 elections*
2. The system must store information for all officially-recognized political parties. The system must allow election officials to access and modify information about individual parties. It must also allow election officials to register new parties in the system.
3. The system must store information for all officially-recognized candidates (direct candidates and list candidates). The system must allow election officials to access and modify information about individual candidates. It must also allow election officials to register new candidates in the system. Direct candidates must be registered for a specific county. List candidates must be registered for a specific party and region. Each candidate must have the following information:
    - Full name
    - Political Party
    - County (“Stimmkreis”) and Region (“Wahlkreis”
4. The system must be able to correctly calculate parliamentary seat allocations based on voting records from an election. It must use the Hare-Niemayer method, observe the “5% hurdle” rule, and correctly handle Overhang Mandates.
5. The system must be reusable for elections in different years. It must be able to store data from the 2013 and 2018 elections.
6. The system must produce statistics about voting trends at the county level. This includes:
    - Direct candidates seeking election in the county.
    - Number of votes for each candidate (Erststimmen) and party (Gesamtstimmen).
    - Percentage of votes for each party (Gesamtstimmen).
7. The system must be able to compare statistics between the 2018 and 2013 elections.
8. The main interface must provide information about the parliamentary assignments resulting from the election. The interface should make use of visual displays (e.g. tables and pie charts) in order to provide data in an intuitive and visually-appealing way.
9. The interface must allow the user to change the election year that they are viewing.

10. The results interface must provide a graphical visualization of the state-wide results. This includes:
    - Number of seats allocated to each party (pie chart and table)
11. The results interface must provide a table displaying regional results. This includes:
    - Number of seats allocated to each party for this region
    - Number of overhang and compensation mandates allocated to each party for this region
12. The results interface must provide a table with information about every candidate who received a seat in Parliament. The table must display the following information for each candidate:
    - Full name
    - Associated party/group (if any)
    - County elected in (if direct candidate)
13. The results interface must provide a graphical visualization of county results. This includes:
    - Direct candidates running for election, and number of votes received by each
    - The direct candidate winner
    - Percentage and count of first votes and second votes per party for this region
    - Turnout rate (percentage of registered voters who cast ballots)
14. The system must provide an interface for submitting new votes electronically, and be able to recalculate parliamentary allocation and other election statistics with the updated votes.
15. The system must protect the privacy of voting information. It should not be possible to determine which voter cast which vote.
16. The system must prevent invalid votes (i.e. an unauthorized person submitting a vote, or a voter voting more than once).

“Can”-Criteria

1. If time allows, the website will feature an interactive map where the results of each Wahlkreis can be seen by hovering over the proper area of the map.

“Limitation”-Criteria

1. No installer program will be provided

Technical implementation

- The backend will be written with Python Flask, and will use PostgreSQL.
- The frontend will be written with ReactJS and Bootstrap.
- Data importation and generation scripts will be provided in Python.

Glossary

1. A **Landtag** is a representative assembly (parliament) with legislative authority and competence over a federated state (Land).
2. A **direct mandate** is a parliamentary mandate that is won by the candidate who receives the most votes in a county (“Stimmkreis”).
3. With the **first vote**, voters select a direct candidate.
4. With the **second vote**, voters select a “list” candidate or party.
5. The **largest remainder method** (also known as **Hare-Niemeyer method**) is the algorithm used to allocate seats in Bavaria.