Exercise 3: Requirements specification
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Must-haves:

Voting:
- Every elective citizen has to be able to submit his Erst- and Zweitstimme online.
- It has to be possible to submit an invalid vote.
- Multiple or illegal votes have to be prevented by an authentication where every citizen has to submit his ID and date of birth beforehand.
- The election has to be completely anonymous, i.e. it should not be possible to relate a single vote to a certain citizen.
- Every vote has to be considered and must not be lost under any circumstances.
- The usage of the online voting should not differ from the voting in the poll site, i.e. both votes can be cast in any possible order.
- The voting of approximately 60 million elective citizens has to be possible during the election and there should be no capacity problems.
- The application must have integrated recovery components.

Analysis of current and previous elections
- The application has to be able to compute the results and predictions of the current election with the current method accurately.
- It has to be possible to display the results of former elections (i.e. the election in 2009)
- There should be various possibilities to visualize the elections available:
    - election turnout (in %)
    - distribution of seats (in number of seats)
    - distribution of Zweitstimmen (in %)
    - distribution of Zweitstimmen per voting site and federal state (in %)
    - distribution of seats per voting site and federal state (in number of seats)

Should-haves:
- The application should be secured against SQL injections, but it does not have to withstand a broad DDoS attack.
- It should be possible to compare the statistics of the current and a previous election.

Can-haves:
- The computation of the individual members of the parliament is reasonable, but not necessary
- Additionally, this analysis is useful:
    - Results of a party in all federal lands (in percent and in number of seats)
    - Results of a party in comparison to a previous election (in percent and in number of seats)

Differentiation criteria:
- An actual election does not have to be executed, a simulation is sufficient
- Additional information or applications for the voting do not have to be offered, which also would not be available in the polling station
- A voting of more than 60 million citizens or a voting for other elections than the election of the Bundestag do not have to be considered

Technical Implementation:
- Relational database: Storage of the data of different elections and of all delivered votes (e.g. PostgreSQL)
- Back end: An application server for the management of the stored data and the delivered votes as well as for ensuring data consistency. Operations can be executed by a REST-API.
- Front end: Representation of the web page, especially the visualization of the analysis, which was explained earlier, and the interactive delivery of a vote (e.g. with a javascript framework). The required data is requested by the provided API.
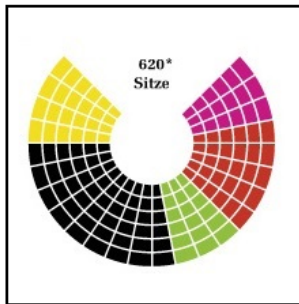
Glossary:
- Erststimme: In the election of the Bundestag each citizen has two votes. With the 'Erststimme' the elector can choose a candidate from his 'Wahlkreis'. The candidate, who achieves the most votes, gets a seat in the Bundestag directly.
- Zweitstimme: In the election of the Bundestag each citizen has two votes. With the 'Zweitstimme' the elector can choose a party and their 'Landesliste'. The percentage of the 'Zweitstimmen' of a party determines the number of seats in the Bundestag this party gets.
- Überhangmandat: These are mandats, which a party gets, when the number of seats, which were achieved by the number of 'Zweitstimmen' for this party is lower than the number of direct candidates. The number of 'Überhangsmandate' for a party is given by the difference between the number of direct candidates and the number of seats, which were won with the 'Zweitstimmen'.
- Ausgleichsmandat: If another party gets 'Überhangsmandate', all other parties in the Bundestag get 'Ausgleichsmandate' in order to have a represatation of the 'Zweitstimmen' in the composition of the Bundestag.
- Wahlkreis: Germany constists of 16 federal lands. Each federal land is again subdived into 'Wahlkreise'. Each citizien is belongs to exactly one 'Wahlkreis' and also votes in this 'Wahlkreis'. In each 'Wahlkreis' one candidate can be elected into the 'Bundestag' directly.
- Landesliste: A party has a 'Landesliste' for each federal land, in which it wants to participate in the election. On this 'Landesliste' the different candidates of the party for this federal land are orderly represented. This order determines which candidates get seats in the Bundestag considering the percentage of 'Zweitstimmen' in the federal land for this party.
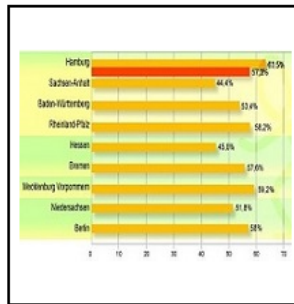
Mockup:

Bundestagswahlergebnisse

Verteilung der Parteien im Bundestag	Wahlbeteiligung	Zum Wählen bitte ausweisen

620*
Sitze

Zum Wählen bitte ausweisen

Personalausweis-Nummer:

Geburtsdatum

OK

Zusätzliche Statistiken zur aktuellen und vorherigen Bundestagswahlen finden Sie hier: Statistiken

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Wahlzettel

für Personalausweisnummer: xxxxxxxxxx

⦿	**Erststimme**
○	Kandidat 1
○	Kandidat 2
○	Kandidat 3
○	Kandidat 4
○	Kandidat 5
○	ungültige Stimmabgabe

⦿	**Zweitstimme**
○	Partei 1
○	Partei 2
○	Partei 3
○	Partei 4
○	Partei 5
○	ungültige Stimmabgabe

Zurück   Stimme abgeben

Wahlzettel

für Personalausweisnummer: xxxxxxxxxx

⦿ Erststimme			e
○ Kandidat 1			
○ Kandidat 2			
○ Kandidat 3			
○ Kandidat 4		○	Partei 4
○ Kandidat 5		○	Partei 5
○ ungültige Stimmabgabe		○	ungültige Stimmabgabe

Stimme abgegeben

Ihre Erst- und Zweit-Stimme wurde
erfolgreich abgegeben.

Bitte klicken Sie auf "OK",
um zum Hauptbildschirm zurückzukehren.

[OK]

[Zurück] [Stimme abgeben]

Statistiken

[-- Bitte wählen Sie eine Statistik aus -- ⌄] [-- Bitte wählen Sie ein Bundesland aus ⌄] [-- Bitte wählen Sie einen Wahlkreis aus -- ⌄]

Jahr 2013

Jahr 2009

Zurück zur Hauptseite: Ergebnisse