## **How to use the simulator**

*Source votes and seats*

First, the user must supply information aboutthevotes of the parties in each constituency. These are used as expected vote values in the simulation of further vote tables. Furthermore the names of parties must be inputted together with the number of constituency seats and adjustment seats. Note that the total number of seats in each constituency is fixed; it does not depend on the election outcome as is the case in some countries.

User defined Excel-tables with these information can be uploaded, for example from a previously saved vote table. In addition, the user can choose from some predefined vote tables, i.e. from all Icelandic elections of the current century.

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*Electoral system*

Secondly, one or more electoral systemmust be designed by the user. The basic rules, like D‘Hondt, largest remainders etc., must be selected. The user mustalso choose between a dozen of different methods to allocate adjustment seats.

*Single election*

In this output the results are calculated on the basis of the choosen votes and seats data for each electoral system seperately. Along with a table with apportioned seats the allocation of the adjustment seats are shown in detail. Thirdly, there is a number of quality indicators for each of the user defined election system. See also the following.

*Simulated elections*

This function allows the user to generate hundreds or even thousands of election results based on the specified table of votes as expected values. The user can specify a coefficient of variation for the distribution of the vote values. These are generated independently for each party list in each constituency using one of three distribution functions.

On the basis of these simulated results averages of the seat allocations are reported together with standard errors and some other statistical indicators. Furthermore diverse quality measures. Some of these require comparing the seat allocations to *Reference seat shares*, where the allocations are calculated exactly in real numbers, not as integer values of seats. For that purpose, the votes are scaled such that the shares sum up to the proper total number of seats, optionally for each constituency or each party or both (using the specified number of seats for constituencies, and the required total number of seats for each party, as determined by the chosen rule for dividing adjustment seats). By default, both constraints are applied which corresponds to the optimal biproportional seat allocation.

The results of the simulation are displayed as it goes on. The final results can also be download as an Excel file including further details.

This software is free to use for experimental purposes, available from [Github](https://github.com/smari/voting/). If used for commercial or political reasons, please contact the supervisor to discuss supporting the project financially.