Homework Assignment: Wonderlandia Election Simulation

Description

In October 2022, elections were finished in Wonderlandia. At stake were 400 seats in the local parliament, and each seat is allocated through a **parallel voting**. Half of the seats are elected by party-list proportional representation (PLPR) with a minimum of 10% electoral threshold of number of votes that enable the party to get seats. The other half elected in single-member constituencies by first-past-the-post voting (plurality voting).

In this assignment, we offer you to code down an election process similar to Wonderlandia's one, with different voting systems (algorithms to compute an election's winner), including:
- Single-Member Plurality Voting (first-past-the-post)
- Borda count
- Condorcet method

Goals

During the Homework Assignment, you will:
- prepare structurised report in Jupyter Notebook format that contain both detailed problem-solving logic and its implementation with code;
- practice in basics of Python (variables, sequences, control flows, etc.);
- practice in stating conditions and logical expressions from tasks of your assignment;
- apply acquired programming skills for solving practical political science problem.

Organizational stuff

These are separate links to submit *Part I* and *Part II*

- You should download both parts of homework as `.ipynb` files to the corresponding section of LMS system before the deadline.
- When uploading multiple solutions, the last one before the deadline will be considered final (but the previous ones can help with the appeal).
- There are penalties for submitting your work after the deadline. They depend on how many hours late your submission is.
- **Any type of cheating will be penalized**. For example:
  - Non-compilable code won't be considered for the assessment.
  - Any type of copy-pasting part or all of the notebook will cause 0 both to subject and object of copy-pasting.
  We are not against helping each other: we are against blind reprinting.

Don't hesitate to contact me or teaching assistants if you have any questions! 🙂

Part I

Deadline: October 23, 11:59 pm

In this part, you play the role of the Election Committee's analyst. You need to prepare collected bulletins for consequent counting: check ballots for spoilage, select candidates who passed the minimum threshold, and compile a report on preliminary analysis.

There are 7 parties in our country - here's General List of Parties:
1. Harmony Party
2. Red Party
3. Justice and Truth
4. Adventure Alliance
5. Animal Friends Party
6. Go Greens!
7. Yo-ho-ho Pirate Party

And there are two types of bulletins:
1. ones arranged in descending order of candidate priority, e.g.:
`['Go Greens!', 'Animal Friends Party', 'Adventure Alliance',`
`'Yo-ho-ho Pirate Party', 'Justice and Truth', 'Harmony Party', 'Red`
`Party']` - Go Greens! are the first choice here. Some ballot of this type may have the different number of parties in it - it means that the voter simply did not choose this party (did not vote for it).
2. with ranked positions according to General List of Parties, e.g.:
`[7, 5, 2, 1, 4, 6, 3]` - Here the Adventure Alliance has the first priority for electioneer as its position (index `[3]`) marked with 1st place. These type of ballots could contain zeroes (meaning the voter is not interested in choosing this party); hence, there should be 7 values in the ballot.

You need to complete following tasks to prepare ballots to the counting procedure.

Part II

Deadline: October 30, 11:59 pm

For the second part of your homework, you need to calculate the winner of election with different voting techniques. All descriptions were taken from the ***Voting Methods*** paper from [Stanford Encyclopedia of Philosophy Archive](#).

We will store each winner in the `final_results` dictionary to eventually compare all methods between one another.