Definitions:

Plurality Election:

Strategic Voting:

Plurality with Runoff:

Preference Rankings:

Examples:

Minimum Votes Needed to Win.

The Central Issue with the Plurality Method.

1992 Presidential Election.

Using Preference Rankings.

|           | Number of Voters | | | | | | |
|-----------|---|---|---|---|---|---|---|
|           | 1 | 3 | 1 | 1 | 1 | 2 | 2 |
| Tuesday   | 1 | 1 | 4 | 3 | 2 | 3 | 4 |
| Wednesday | 2 | 3 | 1 | 1 | 4 | 2 | 2 |
| Thursday  | 4 | 4 | 2 | 4 | 1 | 1 | 3 |
| Friday    | 3 | 2 | 3 | 2 | 3 | 4 | 1 |

# 1.1 - Plurality and Run-off Methods

1. Twelve friends would like to see a movie, so they vote on their options. Their preferences are as follows:

|  | Number of Voters | | | | | | |
|---|---|---|---|---|---|---|---|
|  | 1 | 1 | 1 | 1 | 3 | 3 | 2 |
| Don't be Afraid of the Dark | 1 | 1 | 2 | 3 | 2 | 2 | 3 |
| Rise of the Planet of the Apes | 2 | 4 | 1 | 2 | 3 | 4 | 2 |
| Our Idiot Brother | 3 | 2 | 3 | 1 | 1 | 3 | 4 |
| 30 Minutes or Less | 4 | 3 | 4 | 4 | 4 | 1 | 1 |

(a) If they use a simple plurality vote, which movie would win?

(b) Assuming that everyone else votes the same way, could the two people who ranked "Afraid of the Dark" as # 1 have voted strategically to achieve a more preferable outcome?

(c) Suppose that "30 Minutes or Less" is sold out. Which of the remaining three choices would win a simple plurality vote?

(d) If they do a plurality vote with a run-off between the top 2, which movie would they see? (Assume all movies are available).

2. Suppose that 100 votes are cast in an election between three candidates- Coltrane, Davis, Evans- to be decided by plurality. The first 70 votes are counted as follows:

| Coltrane | 39 |
|----------|----|
| Davis | 23 |
| Evans | 8 |

(a) What is the minimum number of the remaining votes that Coltrane needs to ensure a win?

(b) What is the minimum number of the remaining votes that Davis needs to ensure a win?

(c) What is the minimum number of the remaining votes that Evans needs to ensure a win?

3. The class of 2010 at G. Clinton High School voted on their graduation song. The tally came in:

|  | Percentage of Class | | | | |
| --- | --- | --- | --- | --- | --- |
|  | 18 | 13 | 22 | 18 | 29 |
| Freebird | 1 | 1 | 2 | 3 | 5 |
| School's Out | 2 | 3 | 1 | 2 | 3 |
| I've Had the Time of my Life | 5 | 5 | 5 | 4 | 2 |
| Keep on Rockin' in the Free World | 3 | 2 | 4 | 1 | 4 |
| Theme from "Friends" | 4 | 4 | 3 | 5 | 1 |

(a) Suppose they hold a plurality vote with run-offs among the top 3 songs. Does this yield a majority decision? How should they proceed?

(b) Now consider a plurality vote with a run-off between the top two:

   i. Which song wins?

   ii. Assuming all other votes stay the same, could the 22% of the class who chose "School's Out" vote strategically to achieve a preferable outcome?

   iii. Assuming all other votes stay the same, could the 18% of the class who chose "Rockin' in the Free World" vote strategically to achieve a preferable outcome?

   iv. Assuming all other votes stay the same, could the 29% of the class who chose the theme from "Friends" vote strategically to achieve a preferable outcome?