Maximizing Views for Aligned Articles in a News Media Platform

Politically and commercially affiliated media companies need to prioritize and maximize views for certain "aligned" articles that reflect their interests or goals. The challenge is to dynamically promote these articles while still exploring other content that may attract views. This requires an adaptable strategy that optimizes content promotion in real-time based on changing user preferences. For this I've used the K-arm bandit algorithm to simulate this situation. Taking the Epsilon-Greedy method, taking this into consideration:

- **Articles as Arms**: Each article on the platform is treated as an arm in the bandit problem.
- **View Probabilities**: Each article has an unknown probability of attracting views, which needs to be estimated over time.

The epsilon-greedy algorithm balances exploration and exploitation by randomly selecting articles with a probability of ε(epsilon) or choosing the article with the highest estimated view probability. Aligned articles are prioritized with slightly higher initial view probabilities. The algorithm dynamically updates its estimates based on performance, optimizing real-time promotion. Cumulative views and estimated versus true probabilities are tracked to assess effectiveness. This adaptable and scalable approach integrates into the content management system, automatically promoting articles and allowing for parameter tuning as more data is collected.

Algorithm:

1. **Initialize Parameters**: Set number of articles, promotions, and epsilon value; identify aligned articles.
2. **Set True View Probabilities**: Randomly assign and boost probabilities for aligned articles, ensuring valid bounds.
3. **Initialize Estimates**: Set estimated view probabilities to zero; initialize promotion counts and view trackers.
4. **Promote Articles**: With probability epsilon, select a random article; otherwise, select the article with the highest estimated probability; simulate a view.
5. **Update Estimates**: Increase promotion count and update estimated view probability for the selected article.