

Data Structures: Assignment 1

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1. **Wikipedia Articles** — *Hash map*.

- Hash key is article title, hash value is the article text.
- Access times want to be fast for an article that is read more times than it is edited. For every access of an article, the title is used to locate the article which can be displayed, so the average and worst case times are equal, i.e. constant.
- When the article is edited, or a new article is added, the average case will still be constant. The worst case is when the hash map must be resized, in which case there will be a significant time increase.

2. **Driving Lessons** — *Tree set*.

- Just need to individually store the name of each customer who has had a free lesson.
- Set allows no duplicates, so a user cannot be added more than once. If implementation allows, could check the customer's status in the set at the same time as adding them. When a customer tries to book a free lesson, try to add them to the set. If this fails, then they already exist so cannot have a free lesson. If it is successful, then they have their lesson, but if they try to book again, their name exists in the set.
- When checking a name, the worst case is that they are not already in the set, i.e. linear, same for adding.

3. **Painting Prices** —

4. **Birth Cities** —