Spike 9 – Game Data Structures Short Report

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Approaches:

Tree

Dynamic Array (Vector)

Dictionary/Map

Linked List

Analysis:

1. General Tree:

Advantages –

- Hierarchical structure can create item categories easily.
- Suitable for nested categories and subcategories

Disadvantages –

- More difficult to implement initially.
- Access time can vary depending on tree depth.

2. Dynamic Array (Vector)

Advantages –

- Constant-time access for any item
- Memory efficient as items are stored contiguously.
- Easy to implement and use.

Disadvantages –

- Insertion or removal (especially in the middle) can be slow due to element shifting.
- Requires occasional resizing, which can be costly.

3. Dictionary/Map

Advantages –

- Constant-time average complexity for access, insertion, and deletion.
- Key/Value storage is very useful for inventories layout.
- Ease of implementation.

Disadvantages –

- Memory overhead due to key-value storage.

4. Linked List

Advantages –

- Efficient insertions and deletions as they involve pointer changes.
- No resizing required.

Disadvantages –

- Linear time to access an item.
- Extra memory overhead for pointers.

The data structure that I will choose to create the inventory system for Zorkish is the dictionary/map. It's utility in its key/value storage, constant-time complexity, and personal ease of implementation make it the best choice.