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Task 10 Spike Game Data Structures

**Array / List:**This could be used for small or fixed inventory. Since in most languages, items on the array can be edited easily and have fast random access to it.

*Advantages:*

Simple to edit and understand.

Easy and fast to access.

*Disadvantages:*

Inserting and deleting items in the middle of the list can be slow.

It’s not that flexible, and does not support operations like sorting, unless is done manually.

**Vector:**

While the array is more fixed, a vector is more dynamic but is also fast and easy to access.

*Advantages:*

The vector is fast to access.

Dynamic, when an item is added, it automatically grows size.

Easy to insert elements at the end of the vector.

*Disadvantages:*

Deleting items of the vector takes time, is slow.

The vector can run out of capacity, and when it happens, it needs to relocate the memory, which takes time.

**Inplace Vector:**

It’s a fixed-size data structure. It’s the same as a vector, but it does not grow, meaning items cannot be added.

*Advantages:*Since the size is pre-allocated, there’s no memory reallocations. Avoiding any slowdown in performance.

Fast and easy to access.

Also being pre-allocated allows the user to predict the behavior of the vector.

*Disadvantages:*

Theres not much flexibility, since as mentioned many times before, it has limited space.

And like the normal vector, insertions and deletions of items in the middle of the structure can be slow.

**Linked List:**

It consists of nodes where each one contains data and reference to another, allowing easy insertions and deletions.

*Advantages:*

Inserting and deleting items at any point of the list is faster than arrays and vectors.

The size of the list can grow when an item is added.

Easy to edit the order of the list.

*Disadvantages:*

Accessing the items on the list can take time.

Requires extra memory to store the reference to the next node.