Vector

`#include <vector>

std::vector<DataType> vectorName;`

Unveiling Vector Mysteries:

- Dynamic Vector Dynamics: Adjusts size dynamically, unlike fixed arrays.
- Random Access Brilliance: Contiguous memory enables quick indexing.
- .clear() Confusion Cleared: Wipes data, maintains capacity, reduces size.
- Vector's Versatility: Methods like push_back, pop_back, insert, erase, size, empty, and more simplify manipulation.

Methods

1. size(): Returns the number of elements in the vector.

2. max_size(): Returns the maximum possible number of elements the vector can hold.

3. empty(): Checks if the vector is empty (i.e., if its size is zero).

4. resize(new_size[, value]): Changes the size of the vector. Optionally, a value can be provided to initialize new elements.

5. capacity(): Returns the current storage capacity of the vector.

6. reserve(new_capacity): Requests that the vector's capacity be at least enough to contain a specified number of elements.

7. shrink_to_fit(): Attempts to reduce the vector's capacity to its size.

8. clear(): Removes all elements from the vector.

9. insert(position, value): Inserts elements at the specified position.

10. erase(position): Removes the element at the specified position.

11. push_back(value): Appends an element to the end of the vector.

12. pop_back(): Removes the last element from the vector.

13. emplace(): Constructs and inserts an element in-place.

14. emplace_back(): Constructs and appends an element to the end in-place.

15. back(): Returns a reference to the last element in the vector.

16. front(): Returns a reference to the first element in the vector.

17. data(): Returns a pointer to the underlying array, allowing direct memory manipulation.

18. swap(other_vector): Swaps the contents of the vector with another vector of the same type and size.

19. operator[] (index): Accesses the element at the specified index. No bounds checking is performed.

20. at(index): Accesses the element at the specified index, performing bounds checking.

21. begin(): Returns an iterator to the beginning of the vector.

22. end(): Returns an iterator to the end of the vector.

23. rbegin(): Returns a reverse iterator to the reverse beginning of the vector.

24. rend(): Returns a reverse iterator to the reverse end of the vector.