### core::tensor

template <class T, class Allocator = allocator<T> > class tensor;

#### Member types

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| --- | --- | --- |
| **member type** | **definition** | **notes** |
| value\_type | The first template parameter (T) |  |
| allocator\_type | The second template parameter (Allocator) | defaults to: allocator<T> |
| scalar\_type | scalar<T, Allocator> |  |
| const\_scalar\_type | const scalar\_type |  |
| vector\_type | vector<T, Allocator> |  |
| const\_vector\_type | const vector\_type |  |
| matrix\_type | matrix<T, Allocator> |  |
| const\_matrix\_type | const matrix\_type |  |
| reference | value\_type& |  |
| const\_reference | const value\_type& |  |
| pointer | value\_type\* |  |
| const\_pointer | const value\_type\* |  |
| iterator | a bidirectional iterator to value\_type | convertible to: const\_iterator |
| const\_iterator | a bidirectional iterator to const value\_type |  |
| reverse\_iterator | a bidirectional reverse iterator to value\_type |  |
| const\_reverse\_iterator | a bidirectional reverse iterator to const value\_type |  |
| size\_type | an unsigned integral type that can represent any non-negative value of difference\_type | usually the same as size\_t |
| difference\_type | a signed integral type | usually the same as ptrdiff\_t |

#### Member functions

|  |  |
| --- | --- |
| (constructor) | Construct tensor (public member function) |
| (destructor) | Tensor destructor (public member function) |
| operator= | Assign content (public member function) |

##### Iterators:

|  |  |
| --- | --- |
| begin | Return iterator to beginning (public member function) |
| end | Return iterator to end (public member function) |
| rbegin | Return reverse\_iterator to reverse beginning (public member function) |
| rend | Return reverse\_iterator to reverse end (public member function) |
| cbegin | Return const\_iterator to beginning (public member function) |
| cend | Return const\_iterator to end (public member function) |
| crbegin | Return const\_reverse\_iterator to reverse beginning (public member function) |
| crend | Return const\_reverse\_iterator to reverse end (public member function) |
| vbegin | Return iterator to begin row (public member function) |
| vend | Return iterator to end row (public member function) |
| rvbegin | Return reverse\_iterator to reverse begin row (public member function) |
| rvend | Return reverse\_iterator to reverse end row (public member function) |
| cvbegin | Return const\_iterator to begin row (public member function) |
| cvend | Return const\_iterator to end row (public member function) |
| crvbegin | Return const\_reverse\_iterator to reverse begin row (public member function) |
| crvend | Return const\_reverse\_iterator to reverse end row (public member function) |
| mbegin | Return iterator to begin matrix (public member function) |
| mend | Return iterator to end matrix (public member function) |
| rmbegin | Return reverse\_iterator to reverse begin matrix (public member function) |
| rmend | Return reverse\_iterator to reverse end matrix (public member function) |
| cmbegin | Return const\_iterator to begin matrix (public member function) |
| cmend | Return const\_iterator to end matrix (public member function) |
| crmbegin | Return const\_reverse\_iterator to reverse begin matrix (public member function) |
| crmend | Return const\_reverse\_iterator to reverse end matrix (public member function) |

##### Capacity:

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| --- | --- |
| empty | Test whether container is empty (public member function) |
| dimension | Return dimension (public member function) |
| columns | Return columns (public member function) |
| rows | Return rows (public member function) |
| batch | Return batch (public member function) |
| area | Return area (public member function) |
| volume | Return volume (public member function) |
| row\_size | Return row size (public member function) |
| matrix\_size | Return matrix size (public member function) |
| size | Return size (public member function) |
| max\_size | Return maximum size (public member function) |

##### Element access:

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| --- | --- |
| operator[] | Access element (public member function) |
| at | Access element (public member function) |
| data | Access data (public member function) |
| scalar | Return the specified scalar (public member function) |
| vector | Return the specified vector (public member function) |
| matrix | Return the specified matrix (public member function) |

##### Modifiers:

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| --- | --- |
| assign | Assign a new tensor (public member function) |
| create | Create a tensor without copying the data (public member function) |
| fill | Fill tensor with specified value (public member function) |
| linear\_fill | Fill tensor with linear gradient values (public member function) |
| value | Set tensor elements with specified value (public member function) |
| linear\_value | Set tensor elements with linear gradient values (public member function) |
| generate | Generate values for tensor with function (public member function) |
| remap | Map source data to a tensor (public member function) |
| reshape | Changes the shape of the tensor without copying the data (public member function) |
| swap | Swap content (public member function) |
| clear | Clear content (public member function) |

##### Operations:

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| --- | --- |
| operator+= | Add a value or tensor (public member function) |
| operator-= | Subtract a value or tensor (public member function) |
| operator\*= | Multiply a value or tensor (public member function) |
| operator/= | Divided by a value or tensor (public member function) |
| operator&= | And a value or tensor (public member function) |
| operator^= | Xor a value or tensor (public member function) |
| operator|= | Or a value or tensor (public member function) |

##### Observers:

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| --- | --- |
| get\_allocator | Get allocator (public member function) |

##### Non-member function overloads:

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| --- | --- |
| operator+ | Tensor addition (public member function) |
| operator- | Tensor subtraction (public member function) |
| operator\* | Tensor multiplication (public member function) |
| operator/ | Tensor division (public member function) |
| operator& | Tensor and (public member function) |
| operator^ | Tensor xor (public member function) |
| operator| | Tensor or (public member function) |
| operator< | Tensor less than (public member function) |
| operator> | Tensor greater than (public member function) |
| operator<= | Tensor less than or equal to (public member function) |
| operator>= | Tensor greater than or equal to (public member function) |
| operator== | Tensor equal to (public member function) |
| operator!= | Tensor not equal to (public member function) |