

Month Class

Stephen Gerkin

September 11, 2019

CIST 2362 – C++ II

CRN 22282

Programming Lab 05

Program Description

Month Class demonstrates operator overloading within a class for increment, decrement (pre and postfix), and istream/ostream insertion/extraction operators. The class is demonstrated by initializing an object with no parameters. The object is then incremented, decremented, and changed via user input to demonstrate the operator overloads.

Class Documentation

Month Class Reference

Month class holds information about a month.

Public Member Functions

- **Month ()**
Default no-arg constructor.
- **Month (const std::string &monthName)**
Constructor with name as starting value.
- **Month (const int &monthNumber)**
Constructor with number as starting value.
- **Month (const Month &obj)**
Deep-copy constructor.
- void **setName** (const std::string &monthName)
Setter for name.
- void **setNumber** (const int &monthNumber)
Setter for number.
- std::string **getName** ()
Getter for name.
- int **getNumber** ()
Getter for number.
- **Month operator++ ()**

Operator overload for increment operator (prefix).

- **Month operator++** (int)
Operator overload for increment operator (postfix).
- **Month operator--** ()
Operator overload for decrement operator (prefix).
- **Month operator--** (int)
Operator overload for decrement operator (postfix).
- **~Month** ()
Destructor.

Friends

- **std::ostream & operator<<** (std::ostream &stream, const **Month** &month)
Operator overload for cout insertion operator.
- **std::istream & operator>>** (std::istream &stream, **Month** &month)
Operator overload for cin extraction operator.

Detailed Description

Month class holds information about a month.

Per program requirements, holds a string representation of the month. Also holds a number representation of the month (i.e. 7 for July). Uses a static hash map object to hold onto the string value as map key and the number value as the map value to allow quick lookup when determining the correct name/number for a month. Provides operator overloads for increment, decrement, and in/out streaming.

Constructor & Destructor Documentation

Month ()

Default no-arg constructor.

Sets number to 1 and name to "January".

Month (const std::string & *monthName*)

Constructor with name as starting value.

Parameters

<i>monthName</i>	the name of the month to initialize with.
------------------	-------------------------------------------

Month (const int & *monthNumber*)

Constructor with number as starting value.

Parameters

<i>monthNumber</i>	the number of the month to initialize with.
--------------------	---------------------------------------------

Month (const Month & *obj*)

Deep-copy constructor.

Parameters

<i>obj</i>	the Month object to copy.
------------	----------------------------------

~Month ()

Destructor.

Requires no implementation.

Member Function Documentation

std::string getName ()

Getter for name.

Returns

this->name

int getNumber ()

Getter for number.

Returns

this->number

Month operator++ ()

Operator overload for increment operator (prefix).

Increments this->number and then determines the name. If month is incremented past 12, it is reset to 1.

Month operator++ (int)

Operator overload for increment operator (postfix).

Works as above but with holds and returns the current **Month** object.

Month operator-- ()

Operator overload for decrement operator (prefix).

Decrements this->number and then determines the name. If month is decremented to 0, it is reset to 12.

Month operator-- (int)

Operator overload for decrement operator (postfix).

Works as above but with holds and returns the current **Month** object.

void setName (const std::string & *monthName*)

Setter for name.

WARNING: Input is not validated.

Parameters

<i>monthName</i>	name of month to set to
------------------	-------------------------

void setNumber (const int & *monthNumber*)

Setter for number.

WARNING: Input is not validated.

Parameters

<i>monthNumber</i>	number of month to set to
--------------------	---------------------------

Friends And Related Function Documentation

std::ostream& operator<< (std::ostream & *stream*, const Month & *month*) [*friend*]

Operator overload for cout insertion operator.

Sends a string representation of the **Month** object to the output stream.

Parameters

<i>stream</i>	The outputstream to send to.
<i>obj</i>	The month object being sent to the stream.

Returns

The constructed stream.

std::istream& operator>> (std::istream & *stream*, Month & *month*) [*friend*]

Operator overload for cin extraction operator.

Takes integer or string value from stream and sets appropriate value to stream value, then determines number or name of month as needed. WARNING: Input is not validated!

Parameters

<i>stream</i>	The input stream being used to capture input.
<i>obj</i>	The month object to capture input into.

Returns

The stream object used for input.

Sample Program Output

```
D:\School\2019 - IV - Fall\CIST2362 - C++ II\Programs\0
The current month is...
Month name: JANUARY number: 1
The next month is...
Month name: FEBRUARY number: 2
Month is being incremented.
Month name: FEBRUARY number: 2
After increment:
Month name: MARCH number: 3
The previous month is...
Month name: FEBRUARY number: 2
Month is being decremented.
Month name: FEBRUARY number: 2
After decrement:
Month name: JANUARY number: 1

Looping through the months...

Month name: FEBRUARY number: 2
Month name: MARCH number: 3
Month name: APRIL number: 4
Month name: MAY number: 5
Month name: JUNE number: 6
Month name: JULY number: 7
Month name: AUGUST number: 8
Month name: SEPTEMBER number: 9
Month name: OCTOBER number: 10
Month name: NOVEMBER number: 11
Month name: DECEMBER number: 12
Month name: JANUARY number: 1
Month name: FEBRUARY number: 2

Reversing through the months...

Month name: JANUARY number: 1
Month name: DECEMBER number: 12
Month name: NOVEMBER number: 11
Month name: OCTOBER number: 10
Month name: SEPTEMBER number: 9
Month name: AUGUST number: 8
Month name: JULY number: 7
Month name: JUNE number: 6
Month name: MAY number: 5
Month name: APRIL number: 4
Month name: MARCH number: 3
Month name: FEBRUARY number: 2
Month name: JANUARY number: 1

Enter a month number (ie 7)
>> 7

That month is Month name: JULY number: 7

Enter a month full month name (ie July)
>> july

That month is Month name: JULY number: 7

Do you want to run the program again? (y/n)
>> 
```