CSCE 145: Algorithmic Design I

Homework- 7

Objective: Design the Ship Project and create Java classes as follows:

- Ship
- CruiseShip
- CargoShip
- ShipNavigator

Requirements:

- Functionality (85 pts)
  - No Syntax, Major Run-Time, or Major Logic Errors. (85 pts*)
    - *Code that cannot be compiled due to syntax errors is non-functional code and will receive no points for this entire section.
    - *Code that cannot be executed or tested due to major run-time or logic errors is nonfunctional code and will receive no points for this entire section.
  - Clear and Easy-To-Use Interface (5 pts)
    - Users should easily understand what the program does and how to use it.
    - Users should be prompted for input and should be able to enter data easily.
    - Users should be presented with output after major functions, operations, or calculations.
    - All the above must apply for full credit
  - Design a class called ***Ship*** with the following (20 pts)
    - Instance Variables
  - Name of the ship
  - Launch Date (Format: mm/dd/yyyy) (Hint: read it as a String)

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- Methods
  - Accessors and Mutators for all instance variables
    - The mutator for the instance variable *launch date* is only allowed to accept a ship launched during 1990 - 2019 (both inclusive)
  - A toString method that displays the ship's name and its launch date.
  - Next, design another class called ***CruiseShip*** that is derived from the Ship class (20 pts)
    - Instance Variables
      - Passenger Capacity
      - Number of crew members
    - Methods
      - Accessors and Mutators for all instance variables
      - A toString method that overrides the toString method in the Ship class.
        - It should only display the ship's name, the crew and passenger capacity.
  - Then, create a class called ***CargoShip*** with the following (20 pts)
    - Instance Variables
      - tonnage (DWT: dead weight tonnage is a measure of how much weight a ship can carry. This is different from the ship's own weight)
      - maximum speed
    - Methods
      - Accessors and Mutators for all instance variables

- A toString method that overrides the toString method in the Ship class.
    - It should only display the ship's name, tonnage and maximum speed.

- Finally, create a test class: ***ShipNavigator*** (20 pts)
    - Contains a main method
    - Creates two objects of the type CruiseShip and one object of type CargoShip
    - Have the user enter the values for the instance variables.
    - Print out the results.

- Coding Style (9 points)
    - Readable Code
        - Meaningful identifiers for data and methods.
        - Proper indentation that clearly identifies statements within the body of a class, a method, a branching statement, a loop statement, etc.
        - All the above must apply for full credit.
- Comments (6 pts)
    - Your name at the beginning of the file as a single-line comment. (1 pt)
    - At least 5 meaningful comments in addition to your name. These must describe the function of the code it is near. (5 pts)

Submission:

- Upload all .java files on Dropbox

Example-1:

Welcome to ShipNavigator!!!

Enter the name of the ship:

Harmony of the Seas

Enter its launch date (mm/dd/yyyy):

06/19/2015

Is it a cruise ship or a cargo ship?

Cruise ship

Enter the ship's passenger capacity:

5479

How many crew members are on this ship?

2300

Creating a cruise ship...

Printing the ship's details:

Name: Harmony of the Seas

Passenger Capacity: 5479

Crew: 2300

Do you want to construct another ship object? Enter yes or no:

yes

Enter the name of the ship:

MSC Oscar

Enter its launch date (mm/dd/yyyy):

01/08/2015

Is it a cruise ship or a cargo ship?

Cargo ship

Enter the ship's tonnage (DWT):

197362

Enter the maximum speed of the ship (in mph):

26.2

Creating a cargo ship...

Printing the ship's details:

Name: MSC Oscar

Tonnage: 197362 DWT

Maximum Speed: 26.2 mph

Do you want to construct another ship object? Enter yes or no:

yes

Enter the name of the ship:

Disney Magic

Enter its launch date (mm/dd/yyyy):

04/17/1997

Is it a cruise ship or a cargo ship?

Cruise ship

Enter the ship's passenger capacity:

2700

How many crew members are on this ship?

945

Creating a cruise ship...

Printing the ship's details:

Name: Disney Magic

Passenger Capacity: 2700

Crew: 945

Do you want to construct another ship object? Enter yes or no:

no

Goodbye!

Example-2:

Welcome to ShipNavigator!!!

Enter the name of the ship:

Astoria

Enter its launch date (mm/dd/yyyy):

09/09/1946

Is it a cruise ship or a cargo ship?

Cruise ship

Enter the ship's passenger capacity:

556

How many crew members are on this ship?

280

Creating a cruise ship...

Error: Launch date prior to 1990. Resetting Astoria's launch date to the default 01/01/1990

Printing the ship's details:

Name: Astoria

Passenger Capacity: 556

Crew: 280