**LAB 5**

**10 points**

**Instructions:**

1. After downloading the lab assignment from Blackboard, please write the appropriate Java programs in BlueJ IDE.
2. For this lab assignment, you need to have the knowledge of creating classes.
3. Lab assignments need to be uploaded onto Blackboard by the due date listed on Blackboard.
4. You would need to submit a .docx file. Copy-paste the written code and a sample run of the program.
5. Create a Shipping Company that works as follows:

* The company owns 3 types of ships. A container vessel that has a capacity of 100 people, a crude oil vessel that has a capacity of 50 people, and a cruise liner that has a capacity of 2500 people.
* The cruise liner should have boats on them. Each boat should have a capacity of 5 people. The cargo vessels, on the other hand, need not have boats, but they are mandated to have a helicopter.
* As soon as a captain turns on the cargo ships, the display panel prints:

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* As soon as a captain turns on the cruise liner, the display panel prints:

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* The three ships have different costs of functioning. The table below shows the functioning speed and the cost of operation for a particular ship type:

|  |  |  |
| --- | --- | --- |
| **Type** | **Speed (miles/hour)** | **Functioning Cost ($/mile)** |
| Cruise liner | 10 | 155 |
| Container vessel | 15 | 83 |
| Crude oil vessel | 12 | 101 |

* The three ships are currently at different ports across the world. Assume that your home base, NYC, is at a distance from other ports as stated in the table:

|  |  |
| --- | --- |
| **City** | **Distance (in miles)** |
| NYC | 0 |
| Miami | 1100 |
| Rio de Janeiro | 3400 |
| Madrid | 3200 |
| Shanghai | 6100 |

The cruise liner is currently at Miami, the container vessel is currently at Shanghai, and the crude oil vessel is currently at Rio de Janeiro.

**Questions:**

You are asked to write software to handle typical operations of the Shipping Company.

*Regular tasks:*

The administrator would want to conduct these tasks regularly:

1. What is the cost of bringing back every vessel home. **(2 points)**
2. What is the time it takes to bring every vessel back home. **(2 points)**
3. To remotely turn on the display panel of each ship and check if it works.

**(3 points)**

1. *Occasional tasks:*

Occasionally, new stuffs are ordered. Let’s consider a scenario wherein the admin would like to re-order some new boats on the cruise liner. Assume there are already 5 in stock. How much more money I would need to invest in buying new boats for the capacity of the cruise liner. Each boat costs $8550. **(3 points)**

Please write a software for the shipping company to handle questions 1,2,3, and A. Conduct a sample run and attach the output along with the code in a .docx file.

*Note:* For the points to be given, the code should contain classes and the appropriate calculations to be done within the respective classes which are then aggregated in the ‘Tester’ class. You may model the ‘Tester’ class as follows: When the user inputs either 1, 2, 3, or A, the appropriate answers are displayed on the console.