# Assignment 4 – Inheritance, Polymorphism and Interfaces

Due: Friday, October 21, 11:59PM

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| 1. | Inheritance (Chapter 11, starting page 286)  Create the following classes:  **Vessel**, which is an abstract class and represents any water-going craft.  **Ship**, which is a Vessel. Fun Fact: A *Ship* is any vessel that is large enough to carry smaller *Boats*.  **Boat**, which is a Vessel.  and **Cat**, which is just a cat. | 40% |
|  | All Vessels should have a float speed; and string name;  Ships should have an int fuel and an int maxFuel.  Boats should have an int oars;  Cats should have an int hunger and an int maxHunger;  All Vessels should have the ability to Move.  If a Ship has fuel, it moves at the rate stored in the float speed;  A Boat moves by its speed multiplied by how many oars it has. |  |
| 2. | Polymorphism (Ch. 12, pages 318-342)  Create a program with several Ships and several Boats. Give them varying appropriate values for names, speed, fuel, etc.  Using a **single foreach loop,** make all the Ships and Boats move in the manner specific to each type of Vessel. | 30% |
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| 3. | Interfaces (Ch. 12, pages 342-353)  Create an interface IRefillable with a method void Refill(int amt); and a propertyfloat FuelPercentage{get;}.  Ships and Cats should implement IRefillable.  If a user gets the FuelPercentage property of a Ship, it should return a value representing the percentage of fuel that remains on the Ship.  If a user gets the FuelPercentage of a Cat, it should return a percentage of how full the cat is.  If Refill() is called on a Ship, its fuel should be increased by the amount provided.  If Refill() is called on a cat, its hunger is reduced by the amount provided, to a minimum of 0.  Demonstrate by using these in your program. Output the fuel percentage of a ship and a cat before and after calling Refill(). | 30% |

Submit the files to the assignment on MUOnline in a compressed (.zip) format. Include all project files for your programming solution. The submission should follow the naming convention:

IST303\_*LastName\_FirstInitial\_*A4.zip