Edward Kuisseu Tatchim

Computer Science 1-INT 2210

Lab Assignment #6

Dr. Homer Sharafi

November 29, 2018

**Solution to Lab Assignment #6**

This program is made up of 3 classes; a parent class, and two children classes. The parent class is named ***Ship,*** and the children classes are ***CruiseShip*** and ***CargoShip*.** This program is written to display the content of an array’s elements. These elements are actually classes that were written before being put into this array. For a deeper understanding of the intricacies of this program, follow every line of code that I have written from the parent class all through the children classes.

**Input Data:** The input data for this program was given in the main method of the Cargo ship class when the array element objects were created and given their respective values.

**Processing Data:** The processing that occurs in this program begins right from the beginning of the first line of code. It involves all the declarations of classes, variables, methods, and array index assignments. Classes such as *Ship, CruiseShip,* and *CargoShip* contain many lines of code that do processing at multiple levels; for example, overriding the toString method in the two child classes is real-time inheritance processing. Generating constructors in these children classes is another level of processing within these classes. Having the for loop iterate *i* number of times to display the content of the array elements is also a form of processing. As you go through the code, you will discover many more levels of processing that I may not mention in this section.

**Output Data:** Ultimately, the output gotten from this program is the display from the different alternations of the for loop. i.e., the content of all the array objects.

***Ship* (Written in Java)** – Parent Class

**package** Lab6;

**public** **class** Ship { //defining parent class called Ship

String shipName; //variable field for the ship

**int** shipYear; //variable field to store year the ship was built

**public** **Ship** (String shipName, **int** shipYear) //constructor to initialize the class' variables

{

**this**.shipName=shipName;

**this**.shipYear=shipYear;

}

**public** String **getShipName**() //appropriate accessor for the ship's name

{

**return** shipName;

}

**public** **void** **setShipName**(String shipName) //appropriate mutator for the ship's name

{

**this**.shipName=shipName;

}

**public** **int** **getShipYear**() //appropriate accessor for the ship's year of manufacture

{

**return** shipYear;

}

**public** **void** **setShipYear**(**int** shipYear) //appropriate mutator for the ship's year of manufacture

{

**this**.shipYear=shipYear;

}

**public** String **toString**() // appropriate toString method to return the ship's name and year of manufacture combined

{

**return** "The name of this ship is " + getShipName() + " and it was built in the year: " + getShipYear()+"\n";

}

}

***CruiseShip (Written In Java)***- Child Class

**package** Lab6;

**public** **class** CruiseShip **extends** Ship{ //cruise class extends the parent class, ship

**public** **int** MaxNumberOfPassengers; //new variable field to store the maximum number of passengers that the cruise can carry

**public** **CruiseShip**(String shipName, **int** shipYear, **int** MaxNumberOfPassengers) { //constructor for this cruise's class

**super**(shipName, shipYear);

**this**.MaxNumberOfPassengers=MaxNumberOfPassengers;

}

**public** **int** **getMaxNumberOfPassengers**() { //appropriate accessor for the potential number of passengers

**return** MaxNumberOfPassengers;

}

**public** **void** **setMaxNumberOfPassenger**(**int** MaxNumberOfPassengers) //appropriate mutator for the potential number of passengers

{

**this**.MaxNumberOfPassengers=MaxNumberOfPassengers;

}

**public** String **toString**() //appropriate toString method to display the cruise's name and potential number of passengers combined

{

**return** "The name of this cruise ship is " + getShipName() + " and it can take: " + getMaxNumberOfPassengers() + " passengers"+"\n";

}

}

***CargoShip* (Written In Java)** – Child Class

**package** Lab6;

**public** **class** CargoShip **extends** Ship { //Cargo ship class extends the parent class, ship

**public** **int** tonnage; //new variable field to store the weight of the cargo ship

**public** **CargoShip**(String shipName, **int** shipYear,**int** tonnage) { //constructor to initialize this cargo's class

**super**(shipName, shipYear);

**this**.tonnage=tonnage;

}

**public** **void** **setTonnage**(**int** tonnage) //appropriate mutator for this cargo's potential weight

{

**this**.tonnage=tonnage;

}

**public** **int** **getTonnage**() //appropriate accessor for this cargo's potential weight

{

**return** tonnage;

}

**public** String **toString**() //toString method to display the cargo's name and potential tonnage combined

{

**return** "The name of this cargo ship is " + getShipName() + " and it weighs: " + getTonnage() + " tons"+"\n";

}

**public** **static** **void** **main**(String[] args) { //main method of action

Ship[] **shipArray**= **new** Ship[3]; //declaring an array of type Ship and of capacity 3 to store the collection of ships

shipArray[0]=**new** Ship("Titanic",1909); //ship object created with name and year of creation

shipArray[1]=**new** CruiseShip("Carnival Breeze",2012,3690); //cruise ship object created with name , year of creation, and capacity

shipArray[2]=**new** CargoShip("Regal Princess",2010,142714); // cargo ship object created with name, year of creation, and tonnage

**for**(**int** **i**=0;i<shipArray.length;i++) //for loop to iterate a number of i times to display the content of the array objects.

{

System.**out**.println(shipArray[i].toString()); // displays the content of the specific array objects.

}

}

}