Object Oriented Programming

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Home Work Shipping Company

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1 Introduction:

This is the Object Oriented Programming project in which we asked to implement the solution for "Home Work Shipping Company". It is the java swings application in which we calculate the best shipping methods according to your regular shipping products. The product includes:

- Laptop
- Mouse
- Desktop
- LCD

Their dimensions are also given. There are two container types including:

- Small Container
- Big container

2 Package: methods

2.1 Class: Calculation

2.1.1 Purpose:

This class handles the calculations and logic related to shipping calculations. It manages a list of items, orders, and containers, and provides methods for calculating the total volume, total weight, best shipping method, and shipping price.

2.1.2 Attributes:

items: A list of Item objects representing the items to be shipped.

order: A list of integers representing the quantities of each item in the order.

containers: A list of Container objects representing the available shipping containers.

shipPrice: A double value representing the shipping cost.

bestShipMethod: A string representing the best shipping method.

2.1.3 Methods:

addItems(Item item): Adds an item to the list of items.

addOrder(int quantity): Adds a quantity to the order list.

totalVolume(): Calculates and returns the total volume of the items in the order.

totalWeight(): Calculates and returns the total weight of the items in the order.

bestShipping(): Determines the best shipping method based on the total weight and volume of the items.

shippingPrice(int numSmallContainers, int numBigContainers, double totalWeight): Calculates the shipping price based on the number of small and big containers and the total weight.

printItemInfo(): Prints information about each item in the order.

printOrder(): Prints the order details.

getShipPrice(): Returns the shipping price.

setShipPrice(double shipCost): Sets the shipping price.

getBestShipMethod(): Returns the best shipping method.

setBestShipMethod(String bestShipMethod): Sets the best shipping method.

2.2 Package: main

Abstract Class: ParentClass

2.2.1 Purpose:

This abstract class serves as the parent class for Item and Container classes. It provides common attributes and methods related to dimensions.

2.2.2 Attributes:

name: A string representing the name of the item or container.

length: A double representing the length dimension.

width: A double representing the width dimension.

height: A double representing the height dimension.

2.2.3 Methods:

setName(String name): Sets the name of the item or container.

setLength(double length): Sets the length dimension.

setWidth(double width): Sets the width dimension.

setHeight(double height): Sets the height dimension.

getName(): Returns the name of the item or container.

getLength(): Returns the length dimension.

getWidth(): Returns the width dimension.

getHeight(): Returns the height dimension.

calculateVolume(): An abstract method for calculating the volume of the item or container.

2.3 Package: items

Class: Item

2.3.1 Purpose:

This class represents an item to be shipped. It extends the ParentClass abstract class.

2.3.2 Attributes:

weight: A double representing the weight of the item.

2.3.3 Methods:

Constructor: Initializes the item with the provided dimensions and weight.

setWeight(double weight): Sets the weight of the item.

getWeight(): Returns the weight of the item.

calculateVolume(): Calculates and returns the volume of the item.

printItemInfo(): Prints information about the item.

2.4 Package: containers

Class: Container

2.4.1 Purpose:

This class represents a shipping container. It extends the ParentClass abstract class.

2.4.2 Methods:

Constructor: Initializes the container with the provided dimensions.

printContainerInfo(): Prints information about the container.

2.5 Package: gui

Class: GUI

2.5.1 Purpose:

This class represents the graphical user interface (GUI) for the shipping calculator. It provides methods for creating and managing the user interface components.

2.5.2 Attributes:

frame: A JFrame object representing the main frame of the GUI.

calculation: A Calculation object used for performing the shipping calculations.

itemTableModel: An ItemTableModel object representing the table model for displaying item information.

itemTable: A JTable object representing the table for displaying item information.

orderListModel: An OrderListModel object representing the list model for displaying the order details.

orderList: A JList object representing the list for displaying the order details.

totalVolumeLabel: A JLabel object representing the label for displaying the total volume.

totalWeightLabel: A JLabel object representing the label for displaying the total weight.

shippingMethodLabel: A JLabel object representing the label for displaying the best shipping method.

shippingPriceLabel: A JLabel object representing the label for displaying the shipping price.

smallContainerSpinner: A JSpinner object representing the spinner for selecting the number of small containers.

bigContainerSpinner: A JSpinner object representing the spinner for selecting the number of big containers.

calculateButton: A JButton object representing the button for initiating the shipping calculations.

2.5.3 Methods:

createAndShowGUI(): Creates and displays the GUI components.

updateItemTable(): Updates the item table with the latest item information.

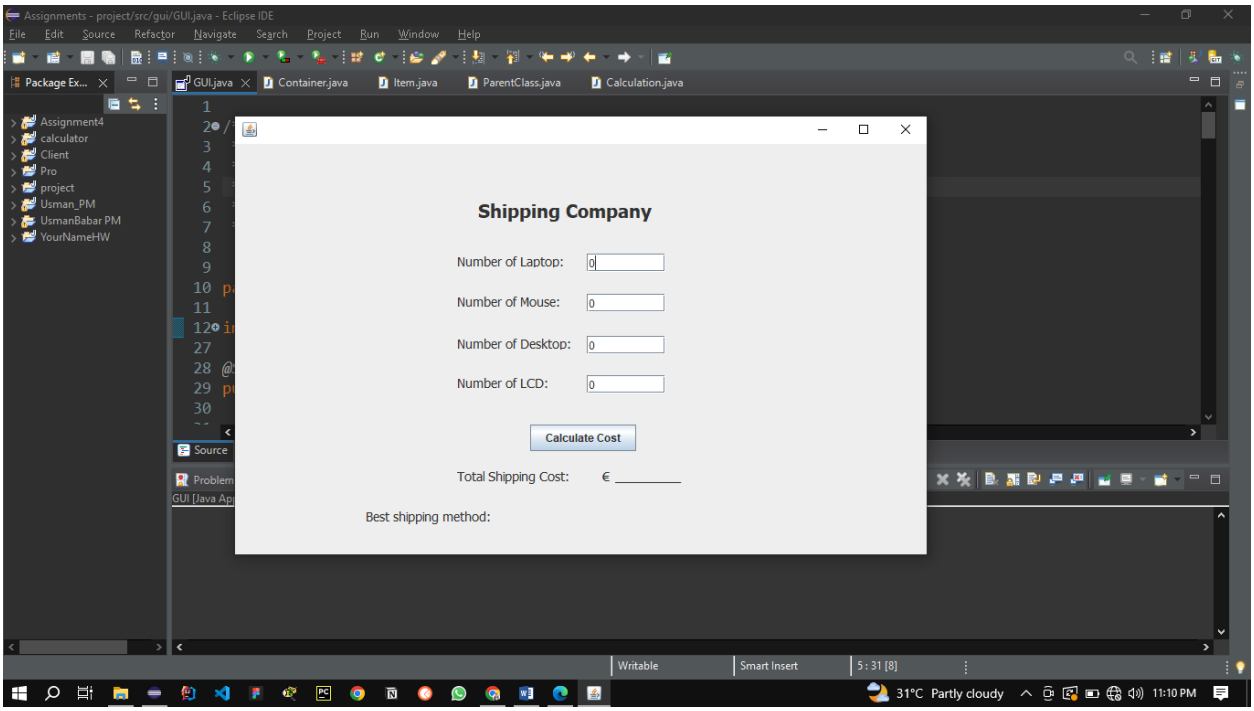
updateOrderList(): Updates the order list with the latest order details.

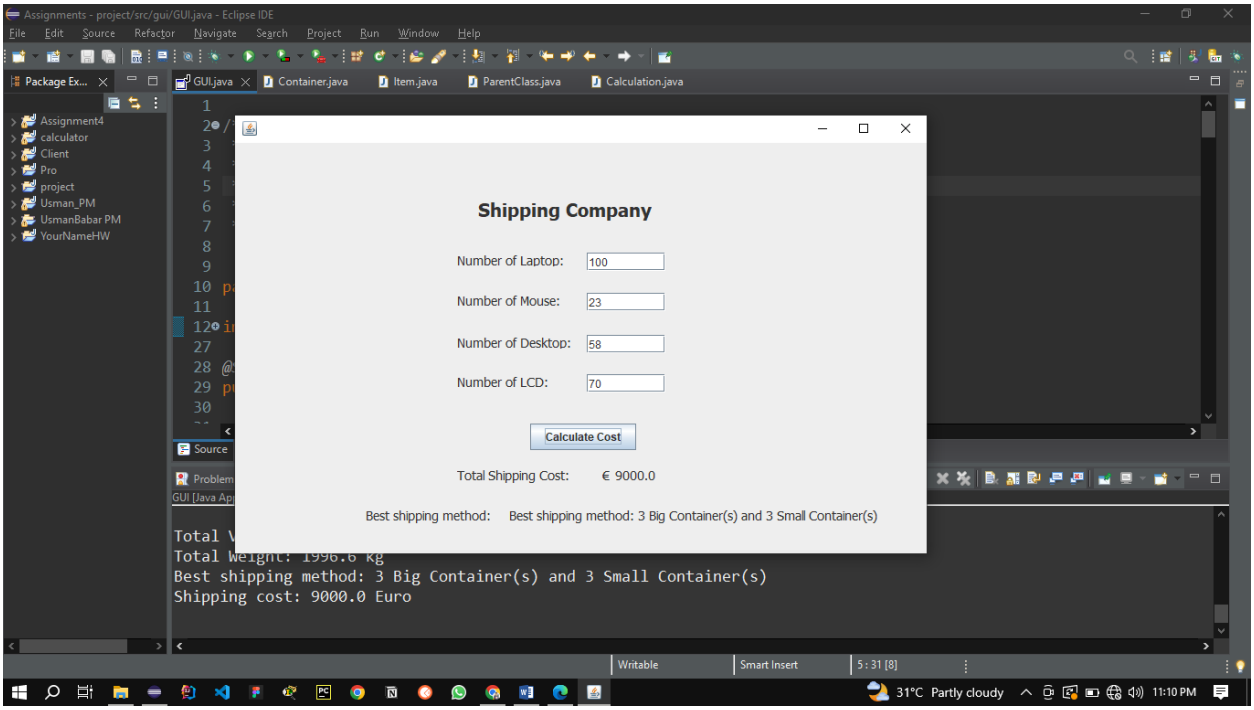
updateShippingDetails(): Updates the shipping details labels with the latest calculations.

actionPerformed(ActionEvent e): Handles the action events generated by GUI components.

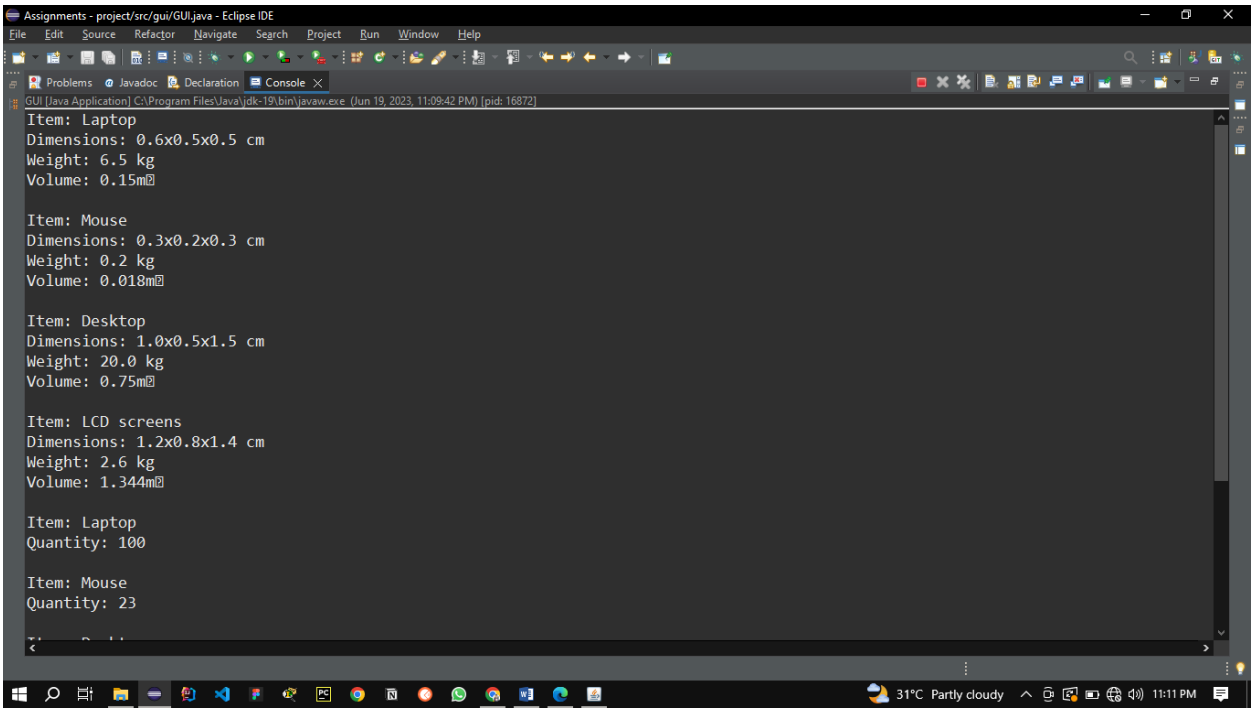
main(String[] args): The main method for launching the GUI.

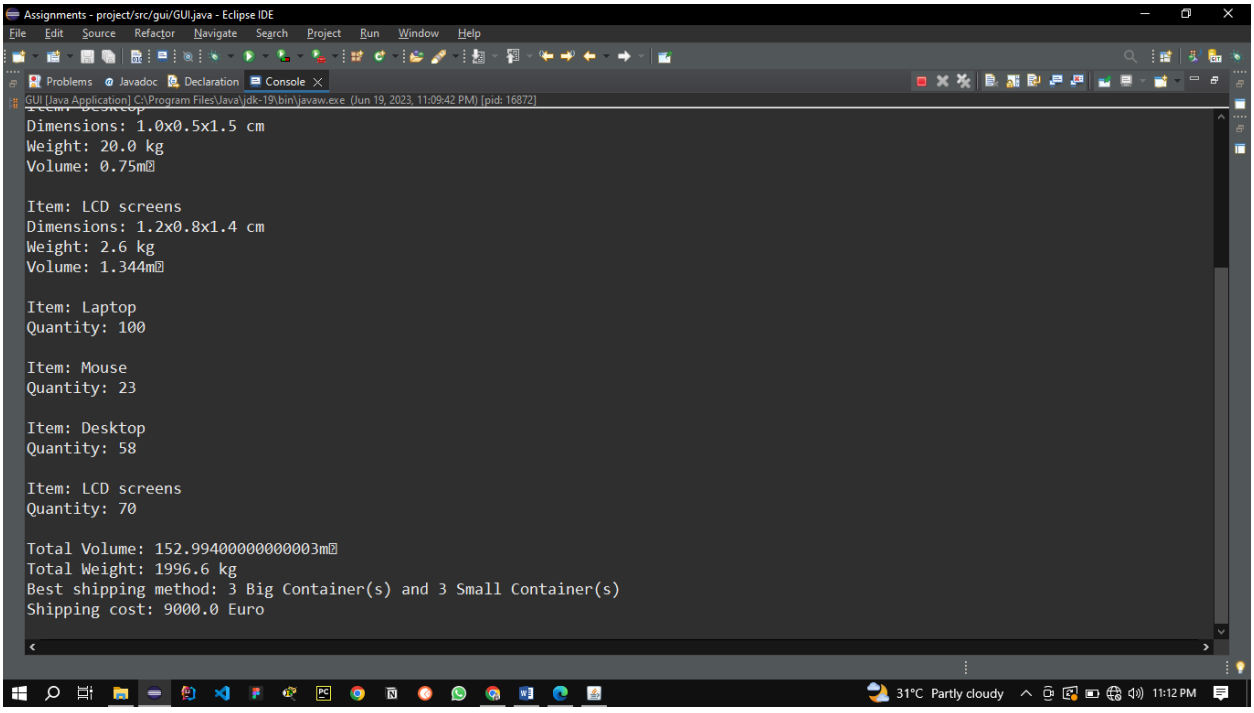
2.6 GUI Screen:





2.7 Output


Assignments - project/src/gui/GUI.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help
Problems Javadoc Declaration Console
GUI [Java Application] C:\Program Files\Java\jdk-19\bin\javaw.exe (Jun 19, 2023, 11:09:42 PM) [pid: 16872]
Item: Laptop
Dimensions: 0.6x0.5x0.5 cm
Weight: 6.5 kg
Volume: 0.15m
Item: Mouse
Dimensions: 0.3x0.2x0.3 cm
Weight: 0.2 kg
Volume: 0.018m
Item: Desktop
Dimensions: 1.0x0.5x1.5 cm
Weight: 20.0 kg
Volume: 0.75m
Item: LCD screens
Dimensions: 1.2x0.8x1.4 cm
Weight: 2.6 kg
Volume: 1.344m
Item: Laptop
Quantity: 100
Item: Mouse
Quantity: 23
31°C Partly cloudy
11:11 PM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Weight: 20.0 kg
Volume: 0.75m
Item: LCD screens
Dimensions: 1.2x0.8x1.4 cm
Weight: 2.6 kg
Volume: 1.344m
Item: Laptop
Quantity: 100
Item: Mouse
Quantity: 23
Item: Desktop
Quantity: 58
Item: LCD screens
Quantity: 70
Total Volume: 152.99400000000003m
Total Weight: 1996.6 kg
Best shipping method: 3 Big Container(s) and 3 Small Container(s)
Shipping cost: 9000.0 Euro
31°C Partly cloudy
11:12 PM