**Documentation for fixing bugs.**

1. In the OrderLine class constructor the assignment of variables was done incorrectly. The local variables were assigned to themselves making no sense. Used this operator to assign the local variable value to the class variables.

Before:

**item = item;**

**quantity = quantity;**

After:

**this.item = item;**

**this.quantity = quantity;**

1. In the Order class the orderLines list was not initialized resulting in a NullPointerException when the code was initially run.

Before: **private List<OrderLine> orderLines;**

After: **private List<OrderLine> orderLines = new ArrayList<OrderLine>();**

1. In the rounding method of calculator class the return type was cast to int resulting in a loss of precision. Used DecimalFormat class from java.text to prevent loss of precision at the same time rounding the result to two decimal places as required for the output.

Before:

**public static double rounding (double value) {**

**return ((int) (value \* 100)) / 100;**

**}**

After:

**public static double rounding(double value) {**

**DecimalFormat f = new DecimalFormat("##.00");**

**return Double.parseDouble(f.format(value));**

**}**

1. In the calculate method while iterating through the map the “imported” check was done only for all small caps while in the input there was a case of “Imported. It resulted in wrong results.
2. All the variables were losing precision due to the use of Math.floor method. Instead used the rounding method to prevent loss of precision.

Before**: Math.floor(totalTax)** After: **rounding(totalTax)**

1. In the main method of Foo class the ArrayList was cleared after put into the map. This resulted in loss of data. Instead reassigned the Order class reference variable to make the previous eligible for garbage collection thus preventing memory wastage.
2. In the main method HashMap was used which was not maintaining the order of input. The output required the order to be maintained. Used LinkedHashMap instead of HashMap to maintain the order.