Software Engineering and Programming Basics - WS2021/22
Exercise 6: Linked Lists

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Task 1

Create a class **IntegerList** which creates a simple linked list based on the List and Node classes. The nodes hold integer values. You can use the source code from the lecture as a base and adjust it.
In addition to the methods that have already been implemented in the lecture, add the following functionalities to your IntegerList:

isEmpty()
Returns true if the list is empty, false if it is not.

size()
Returns the amount of elements in your list.

removeAll()
Receives an integer number and removes every node from the list whose data matches the given number.

addSorted()
Adds a new node to the list in its sorted position.

sum()
Returns the sum of all the elements in the list.

negativePercentage()
Returns the percentage of negative value elements in the list as a double (f.e. 0.4 means 40%).

Task 2

Create a class **GroceryList** to manage a List of Products.
Each Entry in the list holds a **Product** and the **amount** of how many times the product should be bought.
A **Product** consists of its name, the price and a number which represents the location it can be found in.

In the **GroceryList** class, the following methods should be implemented:

add()
Adds a new entry onto the GroceryList.
Special case: If a new entry is for a product that is already on the list, the new amount should be added to the already existing entry.

remove()
Receives the name of a product and removes the entry with the given product's name.

printGroceries()
Prints the grocery list to the console in the format "Product.name x amount", sorted by location.

calculateBill()
Returns the total of the price for the groceries.