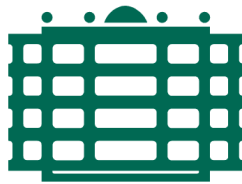


# Software Engineering and Programming Basics - WS2021/22

## Exercise 6: Linked Lists



TECHNISCHE UNIVERSITÄT  
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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.