# Laboratory 8

The class Set is designed to store any number of integers without repetition (similar to multiset). There is basic Set sum operator + which can be used to merge elements of the two Sets. The Set elements are stored without order. Elements of the Set are stored in singly linked list. Implementation of Set class working with integer elements is given.

In function main() just uncomment parts of code, add you code in Part 3 only.
Parts 2,3 and 4 can be done separately ie. Not in order.

## Part 1 – 4 points

Convert given class Set to template class which allow to store any type of elements. Template parameter is a type of data stored in the array. Interface of class should be the same as original class.

## Part 2 – 1 points

In template class Set define specialized method which perform inset() operation for character type which perform operation regardless character is small or capital letter.
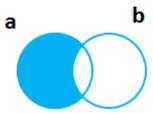
## Part 3 – 2 points

Add exception handling the new operator call (remove nothrow) and improve pop() method on order to use exception in case there is no value to return.

## Part 4 – 1 points

In template class Set declare and define operator- which subtract two sets.
Example figure where result of a-b (solid blue) is presented is on the right.

```
Example output (next page):

--------- 0 -----------
--------- 1 -----------
Set s1: 9 8 7 6 5 4 3 2 1 0
Set s2: 11 10 9 8
s3 Copy of s1: 0 1 2 3 4 5 6 7 8 9
s3 assignment from s2: 8 9 10 11
Already in set, not added
Already in set, not added
s3 sum s1+s2 : 10 11 0 1 2 3 4 5 6 7 8 9
0 in Set s1 ? YES
10 in Set s1 ? NO
After 2 x pop() from s2 : 9 8
--------- 2 -----------
Set of characters : j i h g f e d c b a
z in Set NO
A in Set YES
a in Set YES
```

```
--------- 3 -----------
9
8
No elements in set
--------- 4 -----------
Set 1 : 9 8 7 6 5 4 3 2 1 0
Set 3 : 10 11 0 1 2 3 4 5 6 7 8 9
s3 = s3 - s1 : 10 11
```