

# **1 Circular Linked List**

Here is a description of what you need to do:

Create the circular linked list class as we did during our lecture. All the operations should be implemented

including the ones did in lab: `__str__`, `_get_last`, `insert`, `remove` and `remove_at`. You can start with this assignment and only leave the `remove_at` function for after the lab when it will be covered (or just code it yourself).

Make sure your code is bug free – even if we had a bug in the code we discussed in class! After that, add methods

in the class to support the following new operations:

## **1.1 Length**

Add a function called `len` that returns the length of the list i.e. the number of elements in the list. The logic is simple:

loop over the whole list and keep track of a counter. At the end, return the counter. You might want to separate the

cases in which the list has just one element versus when it has more than one.

## **1.2 Index-based Retrieval**

Add a function called `get` that takes one parameter – an index – and returns the value at that index. For instance, if

we have a list `lst`:

`[1, 2, 5, 4, 2]`

and we call `lst.get(2)`, it should return 5. If the function is called on a list which has no elements, the function

should raise an `IndexError` type exception. For other indices, it should just keep going over the list until that index

is found in a round-robin fashion. For example, for the above list, if we call `lst.get(7)`, it should return 5.

The logic for the retrieval is again quite simple: loop over the whole list and keep track of a counter. When the

counter reaches the desired value, simply return the value at that position.

## **1.3 Push**

Once you have the insert and length functions, push is easy. You just need to call the insert function and pass the

value for position based on the length of the list.

## **1.4 Pop**

Similarly, when you have the get, len and remove\_at functions, pop is easy. Just get the value at the last element,

remove this last element based and return the value.