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Exercise 1:

Changes made:

Line number	Before	After
64	`head_ = new Node(marker->value(), marker->next());`	`head_ = marker->next();`

71- 77	`temp->next (marker->next());`
	`delete temp;`
	`temp = 0;`
	`return 0;`
		`temp->next (marker->next());`
		`// delete temp;`
		`delete marker;`
		`marker = 0;`
		`temp = 0;`
		`return 0;`

Output:

```
ubuntu@azez:~/Desktop/test$ g++ -Wall main.cpp -o main
ubuntu@azez:~/Desktop/test$ gdb ./main
GNU gdb (Ubuntu 12.1-0ubuntu1~22.04) 12.1
Copyright (C) 2022 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.
Type "show copying" and "show warranty" for details.
This GDB was configured as "x86_64-linux-gnu".
Type "show configuration" for configuration details.
For bug reporting instructions, please see:
<https://www.gnu.org/software/gdb/bugs/>.
Find the GDB manual and other documentation resources online at:
    <http://www.gnu.org/software/gdb/documentation/>.

For help, type "help".
Type "apropos word" to search for commands related to "word"...
Reading symbols from ./main...
--Type <RET> for more, q to quit, c to continue without paging--
(No debugging symbols found in ./main)
(gdb)
(gdb) run
Starting program: /home/ubuntu/Desktop/test/main
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".
Creating Node, 1 are in existence right now
Creating Node, 2 are in existence right now
Creating Node, 3 are in existence right now
Creating Node, 4 are in existence right now
The fully created list is:
4
3
2
1

Now removing elements:
Destroying Node, 3 are in existence right now
3
2
1

Destroying Node, 2 are in existence right now
3
2

Destroying Node, 1 are in existence right now
3

Destroying Node, 0 are in existence right now
[Inferior 1 (process 32489) exited normally]
```

Explanations:

when removing the first element, an new node was created and assigned as the head, resulting in a memory leak. So to fix this we can update the **head_ pointer** to point to the next marker, thus, removing the first element from the list.

Additionally, the change from **delete temp**; to **delete marker**; ensures better deletion of the current marker node. Setting **marker to 0** afterwards prevents any potential misuse of the deleted memory.

Exercise 2:

By fixing the bug in exercise 1, this bug also has been fixed, the next output shows that there is no bugs in the code, although I followed the sequence mentioned , which is inserting 1,2,3,4 then removing 2.

Output:

```
ubuntu@azez:~/Desktop/test$ g++ -Wall main.cpp -o main
ubuntu@azez:~/Desktop/test$ gdb ./main
GNU gdb (Ubuntu 12.1-0ubuntu1~22.04) 12.1
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--Type <RET> for more, q to quit, c to continue without paging--
For help, type "help".
Type "apropos word" to search for commands related to "word"...
Reading symbols from ./main...
(No debugging symbols found in ./main)
(gdb) run
Starting program: /home/ubuntu/Desktop/test/main
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".
Creating Node, 1 are in existence right now
Creating Node, 2 are in existence right now
Creating Node, 3 are in existence right now
Creating Node, 4 are in existence right now
The fully created list is:
4
3
2
1

Now removing elements:
Destroying Node, 3 are in existence right now
4
3
1

[Inferior 1 (process 33771) exited normally]
(gdb)
```