

# 2160 Lab 3

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Section Number: 1

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1

```
(gdb) break PrintPerson
Breakpoint 1 at 0x400a8a: file person.cc, line 7.
(gdb) run
Starting program: /Users/Student/ptaylor/embedded-design/unit2/person

Breakpoint 1, PrintPerson (p=0x7fffffff300) at person.cc:7
7          std::cout << p->name << " is " << p->age << " years old.\n";
(gdb) print p
$1 = (Person *) 0x7fffffff300
(gdb) print *p
$2 = {name = "John", age = 10}
(gdb) print p->name
$3 = "John"
(gdb) print p->age
$4 = 10
(gdb)
```

Each line of `print 'variable'` prints the type of each variable.

- `p` is of type `person` and a pointer. It prints the type of `p` and the memory address it points to.
- `*p` prints the information that `p` points to which is the `Person` John, Age 10.
- `p->name` prints the member type name of data structure `Person` (`p`) which is the string John.
- `p->age` prints the member type age of data structure `Person` (`p`) which is the int 10.

2

See Submission for `q2.cc`.

3

All behave as intended

A

```
Main Menu:
1. Add a person
2. Find a person
```

3. Remove a person
4. Print the list
5. Exit

Select an option: 1  
You selected "Add a person"  
Enter Person name: ben  
Enter Person age: 4

Main Menu:

1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit

## B

Main Menu:

1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit

Select an option: 1  
You selected "Add a person"  
Enter Person name: ben  
Enter Person age: 4

Main Menu:

1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit

Select an option: 1  
You selected "Add a person"  
Enter Person name: dave  
Enter Person age: 2

Main Menu:

1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit

Select an option: 2  
You selected "find a person"

```
Enter the person's ID #: 2
ID: 2
Name: dave
Age: 2
```

```
Main Menu:
1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit
```

```
Select an option: 5
You selected "Exit"
```

## C

```
Main Menu:
1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit
```

```
Select an option: 1
You selected "Add a person"
Enter Person name: dave
Enter Person age: 3
```

```
Main Menu:
1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit
```

```
Select an option: 3
You selected "Remove a person"
Enter the person's ID #: 1
```

```
Main Menu:
1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit
```

```
Select an option: 3
You selected "Remove a person"
Enter the person's ID #: 1
```

Person not found!

Main Menu:

1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit

Select an option: 5

You selected "Exit"

## D

Main Menu:

1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit

Select an option: 1

You selected "Add a person"

Enter Person name: dave

Enter Person age: 3

Main Menu:

1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit

Select an option: 3

You selected "Remove a person"

Enter the person's ID #: 1

Main Menu:

1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit

Select an option: 3

You selected "Remove a person"

Enter the person's ID #: 1

Person not found!

Main Menu:

1. Add a person

2. Find a person
3. Remove a person
4. Print the list
5. Exit

Select an option: 5  
You selected "Exit"

```
c:\Users\Patrick\OneDrive - Northeastern University\School\EECE 2160 Embedded Design\ECEE\lab3>cd "c:\Users\Patrick\OneDrive - Northeastern University\School\EECE 2160 Embedded Design\ECEE\lab3\" && g++ q2.cc -o q2 -std=c++11 && "c:\Users\Patrick\OneDrive - Northeastern University\School\EECE 2160 Embedded Design\ECEE\lab3\"q2
```

Main Menu:

1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit

Select an option: 1  
You selected "Add a person"  
Enter Person name: dave  
Enter Person age: 3

Main Menu:

1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit

Select an option: 1  
You selected "Add a person"  
Enter Person name: g  
Enter Person age: 3

Main Menu:

1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit

Select an option: 4  
You selected "Print the list"  
ID: 2  
Name: g  
Age: 3

ID: 1  
Name: dave

Age: 3

Main Menu:

1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit

Select an option: 5  
You selected "Exit"

## E

Main Menu:

1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit

Select an option: 5  
You selected "Exit"

## 4

```
c:\Users\Patrick\OneDrive - Northeastern University\School\EECE 2160 Embedded
Design\ECEE\lab3>gdb
GNU gdb (GDB) 7.8.1
Copyright (C) 2014 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-w64-mingw32".
Type "show configuration" for configuration details.
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>.
Find the GDB manual and other documentation resources online at:
at:
<http://www.gnu.org/software/gdb/documentation/>.
For help, type "help".
---Type <return> to continue, or q <return> to quit---
Type "apropos word" to search for commands related to "word".
(gdb) file q2
Reading symbols from q2...done.
(gdb) break q2.cc:188
Breakpoint 1 at 0x401a8e: file q2.cc, line 188.
```

```
(gdb) run
Starting program: c:\Users\Patrick\OneDrive - Northeastern University\School\EECE
2160 Embedded Design\ECEE\lab3\q2.exe
[New Thread 21288.0x25f8]
[New Thread 21288.0x3cac]

Main Menu:
1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit

Select an option: 1
You selected "Add a person"
Enter Person name: Jeff
Enter Person age: 23

Breakpoint 1, main () at q2.cc:188
188         int test = 0;
(gdb) print list
$1 = {head = 0x853e80, current = 0x853e80, previous = 0x0}
(gdb) print list.head
$2 = (Person *) 0x853e80
(gdb) print list.head->next
$3 = (Person *) 0x0
(gdb)
```

The command `print list` is giving the memory addresses of the list's at that point. `print list.head` give the memory address of the head of the list. `print list.head->next` gives the memory address of the next item of the list, because the first person becomes the head of the list (as was written when `ListInsert` was written in class on Wednesday, the 30th). As there is no person after the list, there is no next person (0x0).

## 5

```
c:\Users\Patrick\OneDrive - Northeastern University\School\EECE 2160 Embedded
Design\ECEE\lab3>g++ q
2.cc -o q2 -g -std=c++11

c:\Users\Patrick\OneDrive - Northeastern University\School\EECE 2160 Embedded
Design\ECEE\lab3>gdb
GNU gdb (GDB) 7.8.1
Copyright (C) 2014 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-w64-mingw32".
Type "show configuration" for configuration details.
For bug reporting instructions, please see:
<http://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 <return> to continue, or q <return> to quit---
Type "apropos word" to search for commands related to "word".
(gdb) file q2
Reading symbols from q2...done.
(gdb) run
Starting program: c:\Users\Patrick\OneDrive - Northeastern University\School\EECE
2160 Embedded Desi
gn\EECE\lab3\q2.exe
[New Thread 16940.0x3bf4]
[New Thread 16940.0x2ad8]

Main Menu:
1. Add a person
2. Find a person
3. Remove a person
4. Print the list
5. Exit

Select an option: 3
You selected "Remove a person"
Enter the person's ID #: 1
Person not found!

Program received signal SIGSEGV, Segmentation fault.
0x00000000004015a4 in ListHead (list=0x0) at q2.cc:40
40      list->current = list->head;
(gdb) backtrace
#0  0x00000000004015a4 in ListHead (list=0x0) at q2.cc:40
#1  0x00000000004019fc in main () at q2.cc:151
(gdb)
```

We see in the original break is from a nullptr being passed to ListHead, we just don't know where, from the segmentation fault. Then, with backtrace, we can see that the call is from line 151, where the actual error occurs.