Debug report

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COMPENG 2SH4 L10

```
37          if(curr > next)
38          {
39              temp.intData = array[i].intData;
40              temp.charData = array[i].charData;
41
42              array[i].intData = temp.intData;
43              array[i].charData = temp.charData;
44
45              array[i + 1].intData = array[i].intData
46              array[i + 1].charData = array[i].charData;
```

Line 45 was missing a semicolon. This syntax error was immediately spotted by inspection.

```
Breakpoint 1, sortDatabyBubble (array=0x61fe18, size=6) at Question4.c:53
53      }
(gdb) info locals
temp = {intData = 77, charData = 97 'a'}
i = 6
```

At line 53, I realized that the program was trying to access an index, i of the array called “array” that is out of bounds in line 34. There is no index 6 in our array. Only indices 0 through 5. Below, the faulty code can be seen.

```
34              next = array[i + 1].intData;
```

This was the appropriate fix.

```
31          for(i = 0; i < (size - 1); i++)
```

```
PS C:\COE2SH4\Lab2\lab2-tourloua> gdb
GNU gdb (GDB) 7.6.1
Copyright (C) 2013 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 "mingw32".
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>.
(gdb) file Lab2.exe
Reading symbols from C:\COE2SH4\Lab2\lab2-tourloua\Lab2.exe...done.
(gdb) break Question4.c: 38
Breakpoint 1 at 0x40398f: file Question4.c, line 38.
(gdb) break Question4.c: 41
Breakpoint 2 at 0x4039b9: file Question4.c, line 41.
(gdb) break Question4.c:44
Breakpoint 3 at 0x4039e3: file Question4.c, line 44.
(gdb) break Question4.c: 47
Breakpoint 4 at 0x403a30: file Question4.c, line 47.
(gdb) run
Starting program: C:\COE2SH4\Lab2\lab2-tourloua/Lab2.exe
[New Thread 18120.0x427c]
[New Thread 18120.0x5e68]
```

```
Breakpoint 1, sortDatabyBubble (array=0x61fe18, size=6) at Question4.c:39
39                      temp.intData = array[i].intData;
(gdb) i locals
temp = {intData = 0, charData = 0 '\000'}
i = 0
curr = 10
next = 2
done = 1
(gdb) c
Continuing.

Breakpoint 2, sortDatabyBubble (array=0x61fe18, size=6) at Question4.c:42
42                      array[i].intData = temp.intData;
(gdb) i locals
temp = {intData = 10, charData = 99 'c'}
i = 0
curr = 10
next = 2
done = 1
(gdb) c
Continuing.
```

```
Breakpoint 3, sortDatabyBubble (array=0x61fe18, size=6) at Question4.c:45
45                      array[i + 1].intData = array[i].intData;
(gdb) i locals
temp = {intData = 10, charData = 99 'c'}
i = 0
curr = 10
next = 2
done = 1
(gdb) c
Continuing.

Breakpoint 4, sortDatabyBubble (array=0x61fe18, size=6) at Question4.c:48
48                      done = 0;
(gdb) i locals
temp = {intData = 10, charData = 99 'c'}
temp = {intData = 10, charData = 99 'c'}
temp = {intData = 10, charData = 99 'c'}
temp = {intData = 10, charData = 99 'c'}
next = 2
done = 1
(gdb) c
Continuing.

Breakpoint 1, sortDatabyBubble (array=0x61fe18, size=6) at Question4.c:39
39                      temp.intData = array[i].intData;
(gdb) i locals
temp = {intData = 10, charData = 99 'c'}
i = 1
curr = 10
next = -5
done = 0
(gdb)
```

After setting up some breakpoints in the “if” statement, I noticed that the program was not ordering the values in ascending order. The problem was within the “if” statement. The index at position i, i+1, and the temporary variables were each set to the value at index i. This means that the first entry would remain unchanged, and each subsequent entry would be changed to the value of its predecessor so long as the subsequent index was a value smaller than the current index.

```
if(curr > next)
{
    temp.intData = array[i].intData;
    temp.charData = array[i].charData;

    array[i].intData = temp.intData;
    array[i].charData = temp.charData;

    array[i + 1].intData = array[i].intData;
    array[i + 1].charData = array[i].charData;

    done = 0;
}
```

This is what the problematic “if” statement used to look like

```
if(curr > next)
{
    temp.intData = array[i].intData;
    temp.charData = array[i].charData;

    array[i].intData = array[i + 1].intData;
    array[i].charData = array[i + 1].charData;

    array[i+1].intData = temp.intData;
    array[i+1].charData = temp.charData;

    done = 0;
}
```

This is what the fixed statement looks like after my edits.

```
PS C:\COE2SH4\Lab2\lab2-tourloua> .\Lab2.exe
..............FF

There were 2 failures:
1) TestQ4_SelectionSort_1: testCases.c:218: expected <97> but was <63>
2) TestQ4_SelectionSort_2: testCases.c:234: expected <32> but was <111>

!!!FAILURES!!!
Runs: 16 Passes: 14 Fails: 2
```

That ended up completely fixing the first function in Question4.c (note that I had yet to do the second part of question four, which returns two errors).