Zach Dubinsky

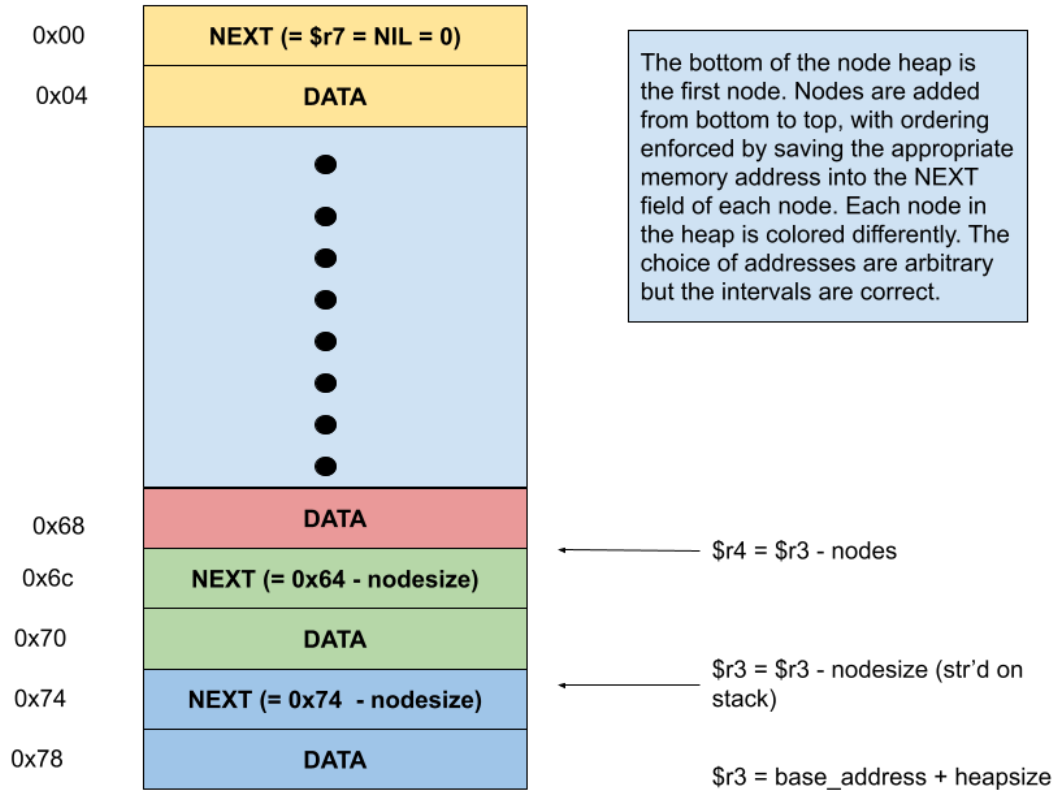
CSC-270-01

3/17/22

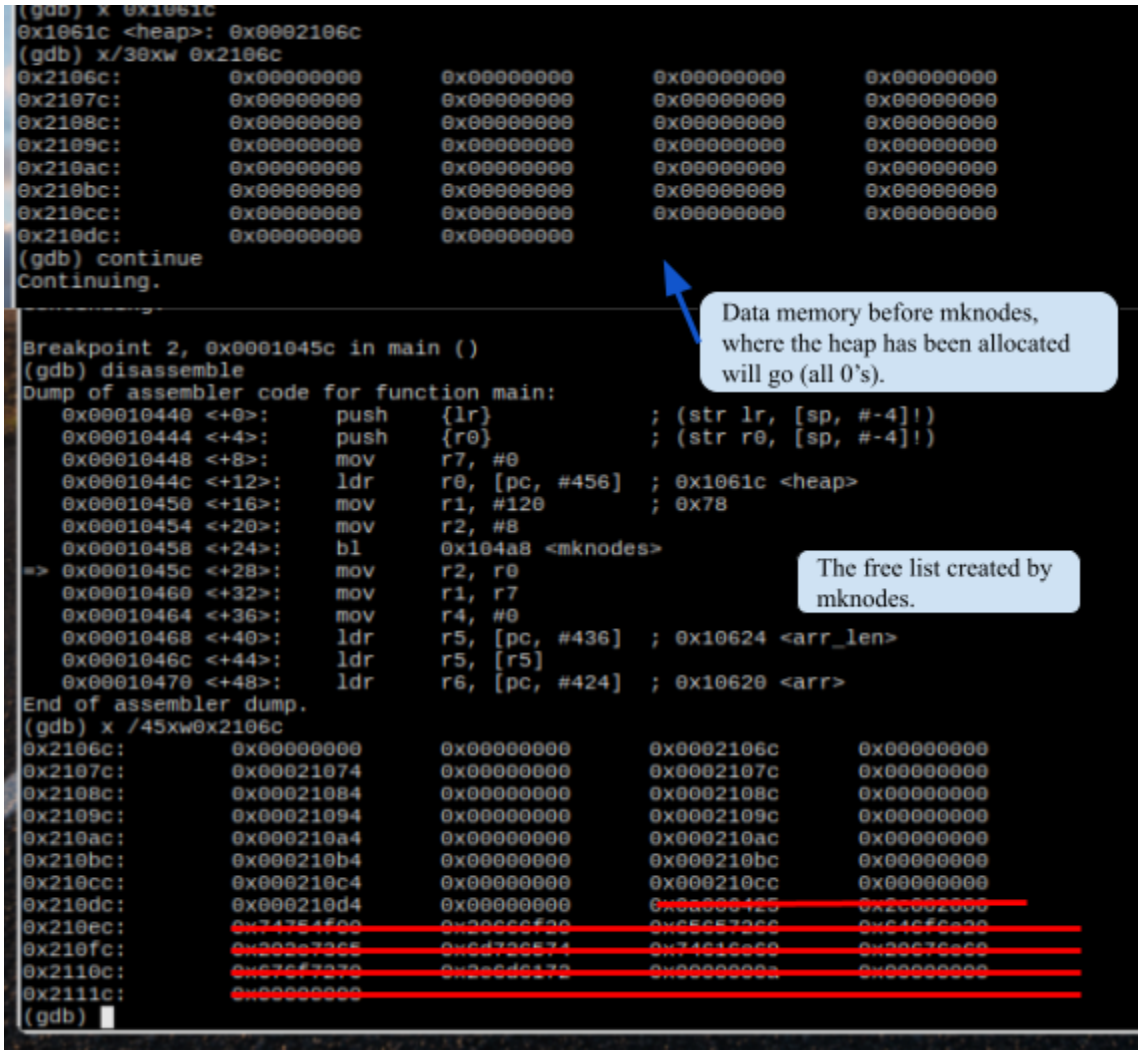
Prof. Rieffel

Lab 7

1. Diagram of mknodes



2. I have included screenshots of my test on the *insert* subroutine. The first image shows the allocated empty space that the heap occupies. The second shows the heap after it has become a free list of nodes by *mknodes*. Note that, with the exception of the first two words, every other word is empty or an address. The former corresponds to the data portion of a node, and the latter corresponds to the address of the next node in the chain. My next two pictures show four subsequent calls to *insert* and the change that occurs in data memory. Finally, the last image shows data memory for the linked list when all elements of the array have been inserted. The output to the console is also included.

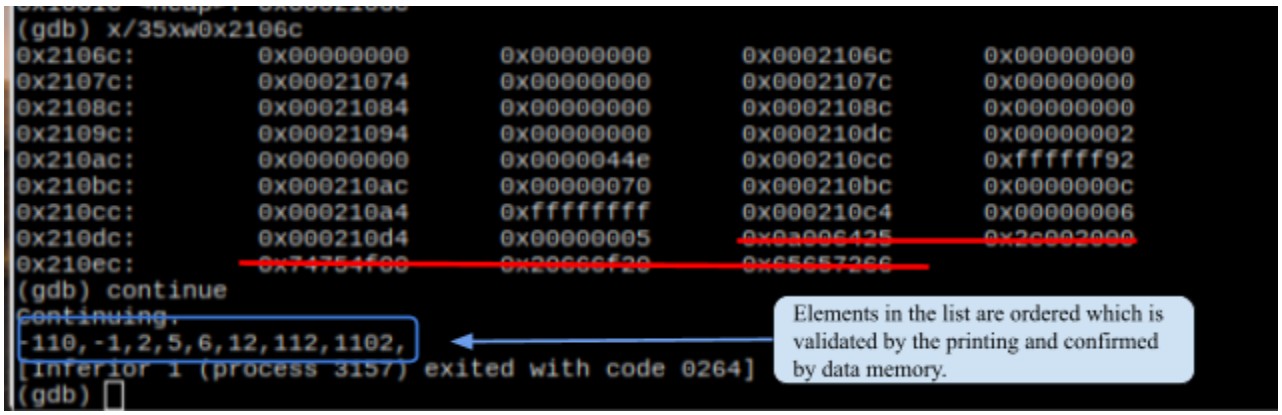


```
Breakpoint 3, 0x00010484 in add_loop ()
(gdb) x/45xw 0x2106c
0x2106c:        0x00000000      0x00000000      0x0002106c      0x00000000
0x2107c:        0x00021074      0x00000000      0x0002107c      0x00000000
0x2108c:        0x00021084      0x00000000      0x0002108c      0x00000000
0x2109c:        0x00021094      0x00000000      0x0002109c      0x00000000
0x210ac:        0x000210a4      0x00000000      0x000210ac      0x00000000
0x210bc:        0x000210b4      0x00000000      0x000210bc      0x00000000
0x210cc:        0x000210c4      0x00000000      0x000210cc      0x00000000
0x210dc:        0x00000000      0x00000005      0x0a006425      0x2c002000
0x210ec:        0x74754f00      0x20666f20      0x65657266      0x646f6e20
0x210fc:        0x202c7365      0x6d726574      0x74616e69      0x20676e69
0x2110c:        0x676f7270      0x2e6d6172      0x0000000a      0x00000000
0x2111c:        0x00000000
(gdb)
```

```
Breakpoint 3, 0x00010484 in add_loop ()
(gdb) x/45xw 0x2106c
0x2106c:        0x00000000      0x00000000      0x0002106c      0x00000000
0x2107c:        0x00021074      0x00000000      0x0002107c      0x00000000
0x2108c:        0x00021084      0x00000000      0x0002108c      0x00000000
0x2109c:        0x00021094      0x00000000      0x0002109c      0x00000000
0x210ac:        0x000210a4      0x00000000      0x000210ac      0x00000000
0x210bc:        0x000210b4      0x00000000      0x000210bc      0x00000000
0x210cc:        0x000210c4      0x00000000      0x00000000      0x00000006
0x210dc:        0x000210d4      0x00000005      0x0a006425      0x2c002000
0x210ec:        0x74754f00      0x20666f20      0x65657266      0x646f6e20
0x210fc:        0x202c7365      0x6d726574      0x74616e69      0x20676e69
0x2110c:        0x676f7270      0x2e6d6172      0x0000000a      0x00000000
0x2111c:        0x00000000
(gdb) continue
Continuing.

Breakpoint 3, 0x00010484 in add_loop ()
(gdb) x/45xw 0x2106c
0x2106c:        0x00000000      0x00000000      0x0002106c      0x00000000
0x2107c:        0x00021074      0x00000000      0x0002107c      0x00000000
0x2108c:        0x00021084      0x00000000      0x0002108c      0x00000000
0x2109c:        0x00021094      0x00000000      0x0002109c      0x00000000
0x210ac:        0x000210a4      0x00000000      0x000210ac      0x00000000
0x210bc:        0x000210b4      0x00000000      0x000210bc      0x00000000
0x210cc:        0x000210dc      0xffffffff      0x00000000      0x00000006
0x210dc:        0x000210d4      0x00000005      0x0a006425      0x2c002000
0x210ec:        0x74754f00      0x20666f20      0x65657266      0x646f6e20
0x210fc:        0x202c7365      0x6d726574      0x74616e69      0x20676e69
0x2110c:        0x676f7270      0x2e6d6172      0x0000000a      0x00000000
0x2111c:        0x00000000
(gdb) continue
Continuing.

Breakpoint 3, 0x00010484 in add_loop ()
(gdb) x/45xw 0x2106c
0x2106c:        0x00000000      0x00000000      0x0002106c      0x00000000
0x2107c:        0x00021074      0x00000000      0x0002107c      0x00000000
0x2108c:        0x00021084      0x00000000      0x0002108c      0x00000000
0x2109c:        0x00021094      0x00000000      0x0002109c      0x00000000
0x210ac:        0x000210a4      0x00000000      0x000210ac      0x00000000
0x210bc:        0x000210b4      0x00000000      0x00000000      0x0000000c
0x210cc:        0x000210dc      0xffffffff      0x000210c4      0x00000006
0x210dc:        0x000210d4      0x00000005      0x0a006425      0x2c002000
0x210ec:        0x74754f00      0x20666f20      0x65657266      0x646f6e20
0x210fc:        0x202c7365      0x6d726574      0x74616e69      0x20676e69
0x2110c:        0x676f7270      0x2e6d6172      0x0000000a      0x00000000
0x2111c:        0x00000000
(gdb)
```


(gdb) x/35xw0x2106c
0x2106c: 0x00000000 0x00000000 0x0002106c 0x00000000
0x2107c: 0x00021074 0x00000000 0x0002107c 0x00000000
0x2108c: 0x00021084 0x00000000 0x0002108c 0x00000000
0x2109c: 0x00021094 0x00000000 0x000210dc 0x00000002
0x210ac: 0x00000000 0x0000044e 0x000210cc 0xffffff92
0x210bc: 0x000210ac 0x00000070 0x000210bc 0x0000000c
0x210cc: 0x000210a4 0xffffffff 0x000210c4 0x00000006
0x210dc: 0x000210d4 0x00000005
0x210ec:
(gdb) continue
Continuing.
-110,-1,2,5,6,12,112,1102,
[Inferior 1 (process 3157) exited with code 0264]
(gdb)
Elements in the list are ordered which is validated by the printing and confirmed by data memory.