

**Course Name**: \_\_\_

Computer Architecture and Assembly Lab\_\_\_\_\_

**Course Number and Section**: **14:332:333:1B**

**Experiment**: Lab 2 Introduction to C Programming Language

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Exercise 1:

1. Explain the changes you made.

Change the values of V0 V1 V2 V3 into

#define V0 3

#define V1 3

#define V2 3

#define V3 3

1. Explain the minimum number of distinct values needed for the preprocessor macros.

4

Since there are V0 V1 V2 and V3 4 values

3. What does the -o flag do with gcc?

If we do not use -o, then the gcc will run a.out instead of the output file we want.

Exercise 2:

1. Explain how do you set the breakpoint at main, and how you run up to that breakpoint.

I use the command “break main”

I use the command “run” and shows

(gdb) run

Starting program: /mnt/e/CA/hello

Breakpoint 1, main (argc=1, argv=0x7ffffffee1e8) at hello.c:4

4 {

2. A list containing the additional gdb commands.

1. How do you pass command line arguments to a program when using gdb?

Using

$ gcc -g -o xxx xxx.c

$gdb xxx

1. How do you set a breakpoint which only occurs when a set of conditions is true (e.g. when certain variables are a certain value)?

break . . . if

1. How do you execute the next line of C code in the program after stopping at a breakpoint?

Using command “n”

1. If the next line of code is a function call, you'll execute the whole function call at once if you use your answer to #3. (If not, consider a different command for #3!) How do you tell GDB that you want to debug the code inside the function instead? (If you changed your answer to #3, then that answer is most likely now applicable here.)

Using command “s”

1. How do you resume the program after stopping at a breakpoint?

Using command “c”

1. How can you see the value of a variable (or even an expression like 1+2) in gdb?

print var

1. How do you configure gdb so it prints the value of a variable after every step?

display

1. How do you print a list of all variables and their values in the current function?

info args

i

9.How do you exit out of gdb?

quit

Exercise 3:

1. Explain the bug and your fix to the function.

In the line 10

while (a != NULL) {

should be

while (a != NULL && b != NULL) {

since

(gdb) print a

$2 = (const node \*) 0x7ffffffee070

(gdb) print b

$3 = (const node \*) 0x0

Exercise 4:

1. Describe how you run CGDB to completion on the executable created by compiling interactive\_hello.c without getting stuck.

Set a breakpoint in mmain and using step in command.

Exercise 5:

1. Implement ll\_cycle.c with the completed ll\_has\_cycle() function. Comment your code and provide explanation for your solution.

if (head==NULL){

return 0;

}

node \* tortoise = head;

node \* hare = head;

while (hare != NULL && hare->next != NULL && hare->next->next != NULL) {

hare = hare->next->next;

tortoise = tortoise->next;

if (tortoise == hare){

return 1;

}

}

return 0;

}

First check the head to see if it is null

Then node tortoise and hare into head.

When hare and hare next and hare next next aren’t null

Then hare goes two nodes and tortoise goes one node.

There is no need to check if tortoise next is null since we have checked hare’s.

Then if tortoise goes to the same node with hare, there is a cycle.