CSC3320 System Level Programming
Lab Assignment 8 - Post-Lab

Name: Venkata Mani Mohana Rishitha Srikakulapu
Lab # 8 – Out of Lab Assignment Report

Part 1:

The code of program q1.c is as follows:

```
[vsrikakulapu1@gsuad.gsu.edu@snowball ~]$ cat -n q1.c
     1  #include<stdio.h>
     2
     3  int foo(int num)
     4  {
     5          int rev_num = 0;
     6          while (num > 0)
     7          {
     8          rev_num = rev_num*10 + num%10;
     9          num = num/10;
    10          }
    11          return rev_num;
    12  }
    13
    14  /* Driver program to test foo */
    15  int main()
    16  {
    17          int num = 1125;
    18          printf("Result is %d", foo(num));
    19          return 0;
    20  }
```

4) Set a breakpoint at the line of statement “while (num > 0)”.
Question: Write your command.

$ (gdb) break 6

4) Run the program until the first breakpoint.
Question: Write your command.

$ (gdb) r

6) Run the while loop step by step using command n multiple times.
(gdb)n
Question: check the value of rev_num and num after each iteration and fill in the table below.

	1st iteration	2nd iteration	3rd iteration	4th iteration
num	112	11	1	0
rev_num	5	52	521	5211

8) Question: Now can you tell what the function foo does?

The function foo returns the reverse number (rev_num) of given number (num). When num is initialized with 1125 in the driver code, the reverse of it i.e., 5211 is calculated as rev_num and returned by the function foo. It is then printed to output through the print statement in the driver code.

Part 2:

Question: Please write down the line numbers containing the errors and show how to correct them.

The code with errors is as follows:

```
[[vsrikakulapu1@gsuad.gsu.edu@snowball ~]$ cat -n q2.c
     1  #include<stdio.h>
     2
     3  int main() {
     4
     5          int letters;
     6          int words;
     7          char character;
     8
     9          printf("Enter a Sentence: ");
    10
    11          while ((character=getchar()) != \n){
    12                  if(character !=' '){
    13                          if(!space){
    14                                  words++;
    15                                  space=1;
    16                          }
    17                          letters++;
    18                  }else
    19                    space = 0;
    20          }
    21
    22          printf("Average word length : %.1f", letters/words);
    23
    24          return 0;
    25  }
```

The errors existing in the code are :

```
[[vsrikakulapu1@gsuad.gsu.edu@snowball ~]$ gcc -o q2 -g q2.c
q2.c: In function 'main':
q2.c:11:2: error: stray '\' in program
  while ((character=getchar()) != \n){
  ^
q2.c:11:35: error: 'n' undeclared (first use in this function)
  while ((character=getchar()) != \n){
                                   ^
q2.c:11:35: note: each undeclared identifier is reported only once for each function it
appears in
q2.c:13:8: error: 'space' undeclared (first use in this function)
    if(!space){
        ^
```

Errors are present in following lines :

line 11 - while ((character=getchar()) != \n){
line 13 – if(!space){

The corrected program is as follows:

```
1  #include<stdio.h>
2  #include<stdbool.h>
3  int main() {
4
5          int letters = 0, words = 1;
6          char character;
7          bool space = false;
8
9          printf("Enter a Sentence: ");
10
11         while ((character=getchar()) != '\n'){
12                 if(character !=' '){
13                         if(!space){
14                                 letters++;
15                                 space=true;
16                         }
17                 }else
18                   words++;
19                   space = false;
20         }
21
22         printf("Average word length : %.1f\n", (float)letters/words);
23
24         return 0;
25 }
```

The corrected program is

```
[vsrikakulapu1@gsuad.gsu.edu@snowball ~]$ vi q2.c
[vsrikakulapu1@gsuad.gsu.edu@snowball ~]$ cat -n  q2.c
     1  #include<stdio.h>
     2  #include<stdbool.h>
     3  int main() {
     4
     5          int letters = 0, words = 1;
     6          char character;
     7          bool space = false;
     8
     9          printf("Enter a Sentence: ");
    10
    11          while ((character=getchar()) != '\n'){
    12                  if(character !=' '){
    13                          if(!space){
    14                                  letters++;
    15                                  space=true;
    16                          }
    17                  }else
    18                    words++;
    19                    space = false;
    20          }
    21
    22          printf("Average word length : %.1f\n", (float)letters/words);
    23
    24          return 0;
    25  }
[vsrikakulapu1@gsuad.gsu.edu@snowball ~]$ gcc q2.c
[vsrikakulapu1@gsuad.gsu.edu@snowball ~]$ ./a.out
Enter a Sentence: It was deja vu all over again.
Average word length : 3.4
```