System Programming CSE25101

Coding Project #3. Machine Language

1. Description

Binary bombs

This assignment is defusing binary bomb. A binary bomb is a program that consists of a sequence of phase. Each phase requires you to type a particular string on stdin. If you type the correct string, then you can enter to next phase. Otherwise, the bomb explodes with printing "BOOM!!!" and then program will be terminated. You need to find out correct strings for all phases to defuse the bomb.

All students have different phases to deal with, so each student will have his/her own solution to defuse their bomb.

2. What to do and submit

You can obtain your bomb in gitlab repository. Compare to previous assignments, TAs will invite you in assignment3 gitlab repository. (We'll give you an explanation.) There are several files in the repository (bomb, bomb.c, and 2018 Spring System Programming Assignment3.pdf). Please clone to server(uni06) and start the defusing your bomb.

Defusing your Bomb (80 points)

You would better to defuse your bomb in the server because we have to use *objdump* and *gdb* which are installed in server. If you have these things in your own environment, you can do the project on your local machine.

The first four phases are worth 10 points each. Phases 5 and 6 are a little more difficult, so they are worth 20 points each. Therefore, the maximum score you can get is 80 points. There are bonus points similar to previous assignment, so I recommend you to start early.

There is another way that you can get bonus point! There exists a secret phase between 4 & 5! If you find out and solve it, there are 10 more bonus points.

Report (20 points)

For each function, write 1~2 page (maximum 2 pages) report explaining how to get the solution for each phases shortly.

3. Submit

You must submit the solution.txt file in your gitlab. In solution.txt file, you have to write your solution string line by line. For example,

Phase 1 solution : Iamhappy
Phase 2 solution : 12345
Phase 3 solution : 2 23 4 5 2
Phase 4 solution : WOW!!
Phase 5 solution : what is this
Phase 6 solution : 12345 6 12

Then, in solution.txt file you have to write

```
Iamhappy
12345
2 23 4 5 2
WOW!!
what is this
12345 6 12
```

You can test your solution.txt in command line.

```
$./bomb < solution.txt
```

Please upload your solution.txt file and report(.pdf) file in your gitlab repository. We will check the time you submit and only consider the most recent code as well as report.

Due date : TBA

**gdb, objdump

- **objdump :** It is for disassembling the binary code.
- **gdb :** The GNU debugger. It will be used for tracing through a program line by line, examining memory and registers, set breakpoints and etc.

Disassemble binary file

You can disassemble binary file by objdump with option -d.

```
$objdump -d ./binary_file
```

It will print the disassembled code of binary_file. If you want to store the output of dump, you can redirect the result using '>' or '>>' command. (If you don't know how, please search on google "How to redirect output on unix system?")

Run program with gdb

You can run the program with gdb. It is for tracing the program with investigating memory and registers.

```
$gdb ./program
```

It will execute gdb with the given program. You can run the program with 'run' command in gdb. If you need more information about gdb, you can search in Google. I will give you some useful url about gdb : http://www.yolinux.com/TUTORIALS/GDB-Commands.html

***This assignment is referenced from the following:*

1. CMU system programming bomblab assignment