# CENG 331

# Computer Organization

# Bomb Lab Recitation

Fall 2022

# Outline

- Introduction
- Getting Started
- Running the Bomb
- Useful Commands
- Tracing Assembly with gdb
- Resources, Tips

# Introduction

- Goal: Deactivating “bombs”, compiled binaries that you need to enter specific strings to “defuse” phases.
- 6 phases in each bomb, each bomb has different set of phases and solution strings.
- Practice your assembly reading skills and understand the way compiler converts C to x86.

# Getting Started

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Get the bomb from:

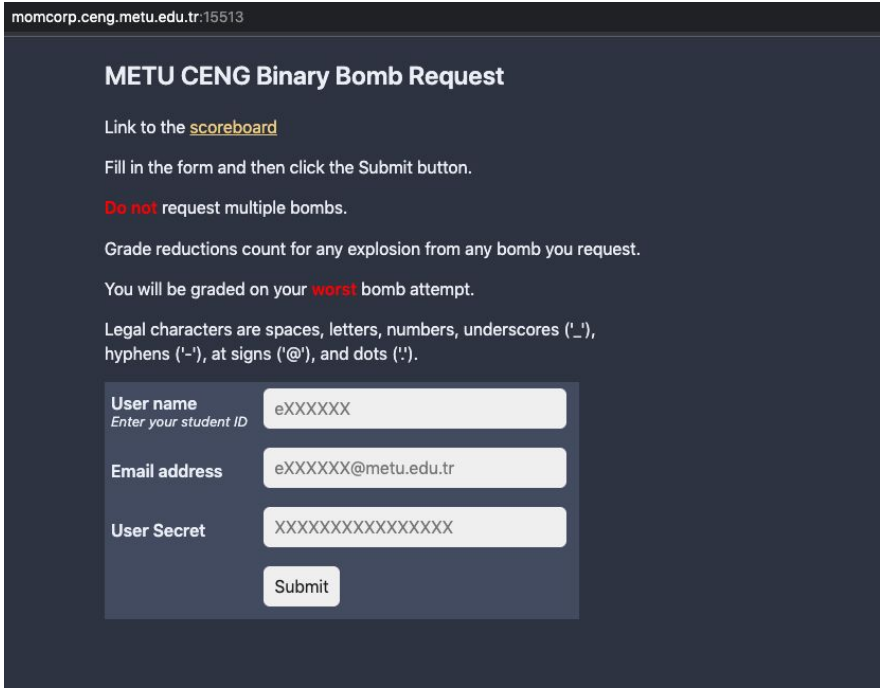
- http://momcorp.ceng.metu.edu.tr:15513

You have to be on the campus network or use METU VPN for your connection.

To get the bomb you need:

- Username: 6 digit username: eXXXXXX
- Email: Any proper email that is reachable
- Usersecret: 16 digit secret that we have provided to you.

# Getting Started



# Getting Started

- You are **NOT** allowed to get multiple bombs.
- If you do so, your lowest grade bomb will be considered while grading.
- Moreover, we will count the total number of explosions of your bombs.

Grade = MIN(bombgrades) - SUM(explosions) * 0.5

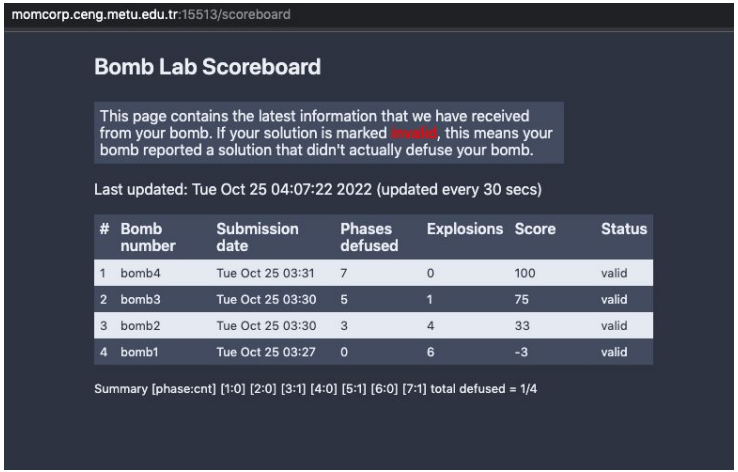
# Running the Bomb

- You can run the bomb on inek machines from [1,100]. You are not allowed to use your personal computers for this homework.
- You can put your bombs to inek machines using sftp or scp.
- And work on the inek machines from home using ssh.

# Running the Bomb

Your important actions (bomb defusals, explosions) will be notified to the bomb server. You can follow them from:

- http://momcorp.ceng.metu.edu.tr:15513/scoreboard



# Useful Commands

- objdump -d Disassembles instruction related parts of the object file.
- strings prints printable strings of length >= 4 found in the file.
- objdump -t prints the symbol table of the object file.

# Useful Commands

> gdb bomb := start gdb with bomb

gdb> run := run program with cmd_args

gdb> break := put a break point to the specified label or addr

gdb> info break := list active breakpoints

gdb> delete <#> := delete breakpoint with number “#”

gdb> continue := run program until a breakpoint is hit

gdb> stepi := run a single instruction

gdb> nexti := run a single instruction, if it is a function call, run program until function returns

gdb> kill := terminate the program

gdb> disas := lists assembly code of the current function

gdb> disas := lists assembly around instruction addr, label or for the whole function.

# Useful Commands

gdb> print ($rsp) := print contents of %rsp as decimal signed number

gdb> tui <enable/disable> := enables/disables a more gui like view

gdb> layout <asm/regs/source> := changes tui view to your liking

gdb> focus <asm/regs/cmd> focuses cursor for the specified window in tui mode.

# Resources and Tips

- A cheat sheet about GDB:
  - http://csapp.cs.cmu.edu/2e/docs/gdbnotes-x86-64.pdf
- Chapter 3 of the textbook
- Read homework carefully, there are some tips and important details there.