Computer Systems Organisation

Tutorial 2

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Basics of GDB

GDB

GDB - Debugger, is a program that runs other programs, allowing the user to have control on it.

- It supports many languages.
- Ex: Assembly, C, C++ etc.

GDB Initialization

- gcc -g -c example.s && ld example.o

  This will generate an executable file.

- gdb ./a.out

  This opens gdb console in terminal. where you can control the flow of program.

GDB Commands.

- “q” or “quit” : exits the gdb debugger.
- “r” or “run” : starting the execution of program.
- “k” or “kill” : kills the current running program.
- “help” : get information about gdb.

GDB Breakpoints...

- [b]reak <argument>
  - argument may be ***(address)** or **func_name**.
  - creates breakpoint at specified location.
  * gdb assigns serial number to each breakpoint.
    Ex: 1,2,3….

- [d]elete <argument>
  - deletes the specified breakpoint using serial number.
  - if nothing specified, deletes all breakpoints.

GDB Information/Data

- [i]nfo <option>
  - gets the information about option.
  - Ex : info registers
    - prints registers and their values.

- [p]rint <option>
  - option may be register or value.
  - Ex : print $rax
    - prints the contents in rax register.

GDB disas

- disas <options>
  - it displays assembly instructions corresponding to specified options.
  - options may be **function name, address, address range(start, end).**

GDB resources...

- Along with these it provides various other commands.
- Ex: stepi, continue, where etc.
- Refer to gdb resources uploaded on git. https://github.com/aadilmehdis/Computer-System-Organisation-2020/tree/master/Resources/gdb

Sample x86-64 Codes