Extra Bonus for MP1: GDB debugger

1. Run `sudo apt-get install gdb` to install GDB debugger.

2. Add `-ggdb` flag after all `gcc` in the `makefile`.

```
# ==== UTILITIES ====

utils.o: utils.H utils.C
        gcc $(GCC_OPTIONS) -ggdb -c -o utils.o utils.C

# ==== DEVICES ====

console.o: console.H console.C
        gcc $(GCC_OPTIONS) -ggdb -c -o console.o console.C

# ==== KERNEL MAIN FILE ====

kernel.o: kernel.C
        gcc $(GCC_OPTIONS) -ggdb -c -o kernel.o kernel.C
```

3. Delete line `OUTPUT_FORMAT('binary')` in the `linker.ld`

4. In `makefile` and `copykernel.sh`, replace `kernel.bin` with `kernel`

5. Run `make` and `./copykernel.sh`

6. Add line to `bochsrc.brxc`:

```
# enable GDB stub
gdbstub: enabled=1, port=7777, text_base=0, data_base=0, bss_base=0
```

7. Create a file `.gdbinit` in project directory. Add lines to `.gdbinit`:

`file kernel`

`set architecture i386:x86-64:intel`

`target remote localhost:7777`

8. Run `bochs -f bochsrc.bxrc`

9. Run `gdb` on a new terminal (in the project directory)

10. Debug the kernel with GDB debugger using commands like `b` (break point), `c` (continue), etc.

```
guest@TA-virtualbox:~/Documents/MP1_Sources$ bochs -f bochsrc.bxrc
==============================================================================
                   Bochs x86 Emulator 2.4.6
          Build from CVS snapshot, on February 22, 2011
                 Compiled at Nov 11 2011, 09:31:18
==============================================================================
000000000000i[     ] LTDL_LIBRARY_PATH not set. using compile time default '/usr/
lib/bochs/plugins'
000000000000i[     ] BXSHARE not set. using compile time default '/usr/share/boch
s'
000000000000i[     ] reading configuration from bochsrc.bxrc
000000000000i[     ] Enabled gdbstub
000000000000i[     ] lt_dlhandle is 0x3b1b990
000000000000i[PLGIN] loaded plugin libbx_x.so
000000000000i[     ] installing x module as the Bochs GUI
000000000000i[     ] using log file bochsout.txt
Waiting for gdb connection on port 7777
Connected to 127.0.0.1
guest@TA-virtualbox:~/Documents/MP1_Sources$ 
```

(terminal 1)

```
guest@TA-virtualbox:~/Documents/MP1_Sources$ gdb
GNU gdb (Ubuntu/Linaro 7.4-2012.04-0ubuntu2.1) 7.4-2012.
04
Copyright (C) 2012 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.o
rg/licenses/gpl.html>
This is free software: you are free to change and redist
ribute it.
There is NO WARRANTY, to the extent permitted by law.  T
ype "show copying"
and "show warranty" for details.
This GDB was configured as "x86_64-linux-gnu".
For bug reporting instructions, please see:
<http://bugs.launchpad.net/gdb-linaro/>.
The target architecture is assumed to be i386:x86-64:int
el
0x000000000000fff0 in ?? ()
(gdb) break main()
Breakpoint 1 at 0x100058: file kernel.C, line 29.
(gdb) break kernel.C:35
Breakpoint 2 at 0x10008d: file kernel.C, line 35.
(gdb) c
Continuing.

Breakpoint 1, main () at kernel.C:29
29       {
(gdb) c
Continuing.

Breakpoint 2, main () at kernel.C:36
36          Console::puts("Replace the following <NAME> fi
eld with your name.\n");
(gdb) c
Continuing.
Remote connection closed
(gdb) quit
guest@TA-virtualbox:~/Documents/MP1_Sources$
```

(terminal 2)