Lab 1 ELF

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АВРОРА
своя система

Useful utilities – readelf, objdump, ldd

› There are subset of helpful utilities to work with elf file format:

› **readelf** – display information about ELF files,

› **objdump** – display information from object files,

› **ldd** – print shared object dependencies.

```
Terminal                                                                    ⊖ □ ⊗

File  Edit  View  Search  Terminal  Help
user@ubuntu  ▶ ~/Desktop/UI ▶   readelf -d a.out | grep NEEDED
0x0000000000000001 (NEEDED)                 Shared library: [libc.so.6]
user@ubuntu  ▶ ~/Desktop/UI ▶   objdump -p a.out | grep NEEDED
 NEEDED               libc.so.6
user@ubuntu  ▶ ~/Desktop/UI ▶   ldd a.out
      linux-vdso.so.1 (0x00007ffcd2ff2000)
      libc.so.6 => /lib/x86_64-linux-gnu/libc.so.6 (0x00007fe0733db000)
      /lib64/ld-linux-x86-64.so.2 (0x00007fe0735ec000)
user@ubuntu  ▶ ~/Desktop/UI ▶
```

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TASK

› Learn how LDD utility works.

› Implement the app called `bldd` (backward ldd) – that shows all EXECUTABLE files that use specified shared library files. *See example.*

› App must be configurable (for ex. Possibility to set up scan directory)

› App must generate report as the output (txt, pdf, etc.) – can be implemented using any languages and libraries.

› Report must be sorted by number of executable usages (high -> low). *See example.*

› App **must** accept libraries with at least following arches: x86, x86_64, armv7, aarch64. (must be architecture dependent)

› App must have `help` with usage examples.

› Graded output: source code with report including screenshots. (in PDF)

Acceptance criteria

› **A (20 points) –** app meets all listed criteria.

› **B (15-19 points)** – minor issues (for ex. No help for app, no directory configuration).

› **C (10-14 points)** – major issues (for ex. App can work only with one arch or do not care about arches).

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Output example

```
Report on dynamic used libraries by ELF executables on /home


---------- i386 (x86) ----------

libc.so.0.1 (1 execs)

        -> /home/inno/QEMU/buildroot-2022.02.1/output/build/host-patchelf-0.9/tests/no-rpath-prebuild/no-rpath-kfreebsd-i386

libc.so.0.3 (1 execs)

        -> /home/inno/QEMU/buildroot-2022.02.1/output/build/host-patchelf-0.9/tests/no-rpath-prebuild/no-rpath-hurd-i386

libc.so.6 (1 execs)

        -> /home/inno/QEMU/buildroot-2022.02.1/output/build/host-patchelf-0.9/tests/no-rpath-prebuild/no-rpath-i386

------------ x86-64 ------------

libc.so.6 (681 execs)

        -> /home/inno/QEMU/buildroot-2022.02.1/output/build/host-gmp-6.2.1/gen-psqr

        -> /home/inno/QEMU/buildroot-2022.02.1/output/build/host-gmp-6.2.1/gen-fib

        -> /home/inno/QEMU/buildroot-2022.02.1/output/build/host-gmp-6.2.1/gen-trialdivtab

        -> /home/inno/QEMU/buildroot-2022.02.1/output/build/host-gmp-6.2.1/gen-fac

        -> /home/inno/QEMU/buildroot-2022.02.1/output/build/host-gmp-6.2.1/gen-bases

        -> /home/inno/QEMU/buildroot-2022.02.1/output/build/host-gmp-6.2.1/gen-jacobitab
```

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Thanks for your attention!

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About US

Open Mobile Platform, LLC

Shortly:

› Founded in 2016

› Offices in Moscow, Nizhny Novgorod, Innopolis and St.Petersburg

› 300+ qualified IT specialists

Main products:

› OS Aurora + Aurora SDK

› Cloud Platform
Aurora Center (Enterprise Mobility Management)

› Aurora TEE