Національний технічний університет України
«Київський політехнічний інститут імені Ігоря Сікорського»
Факультет інформатики та обчислювальної техніки
Кафедра обчислювальної техніки

Архітектура комп’ютера - 3

Лабораторна робота №1

Виконав:
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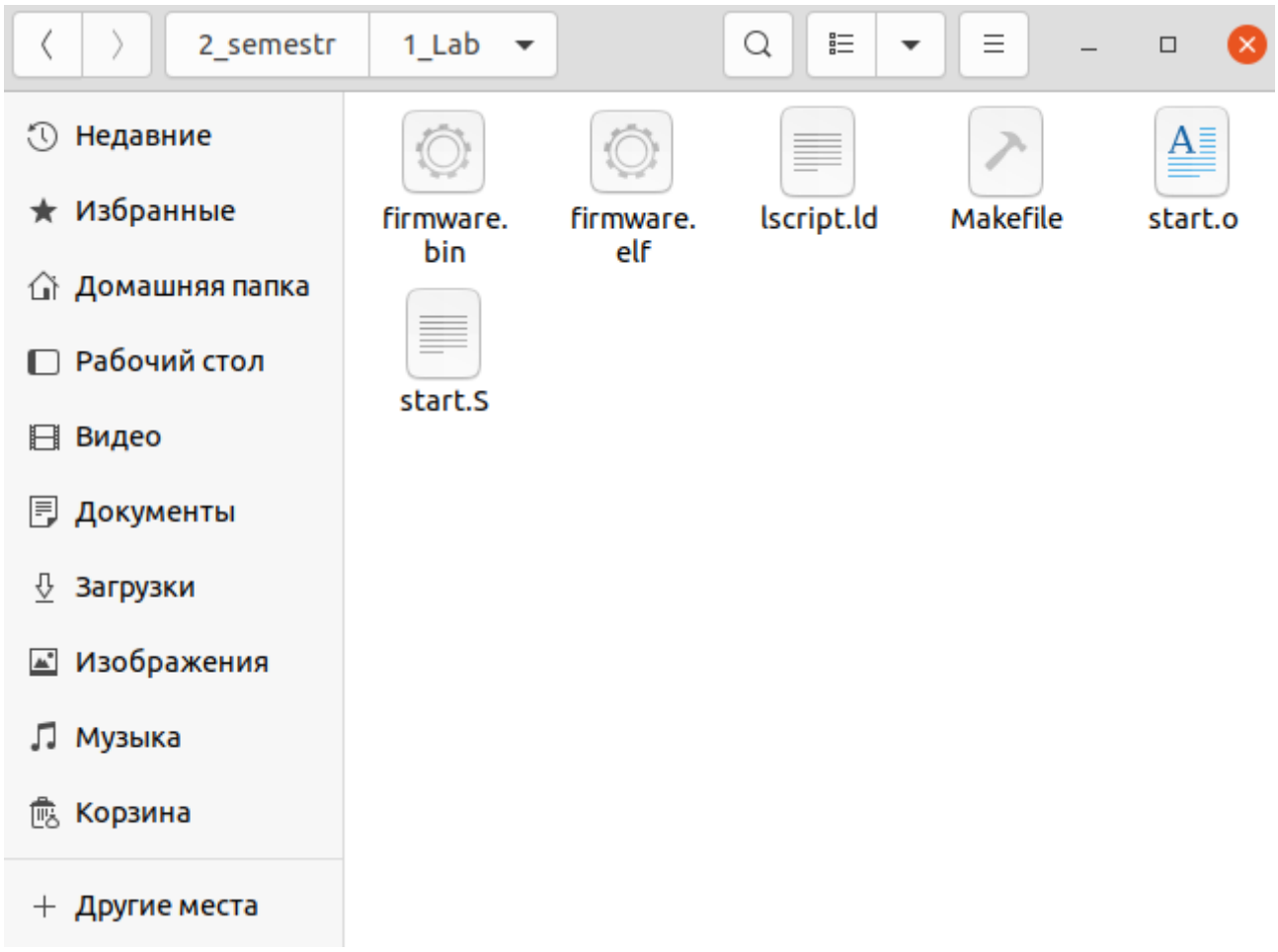
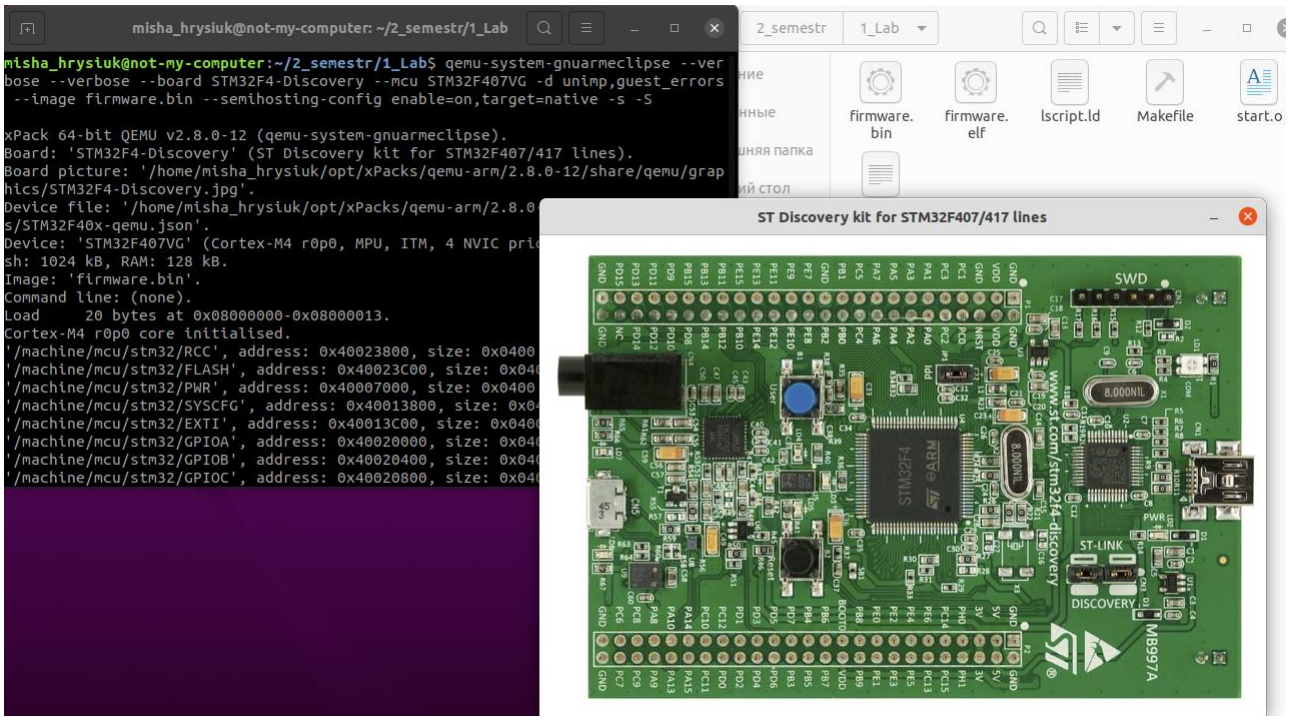
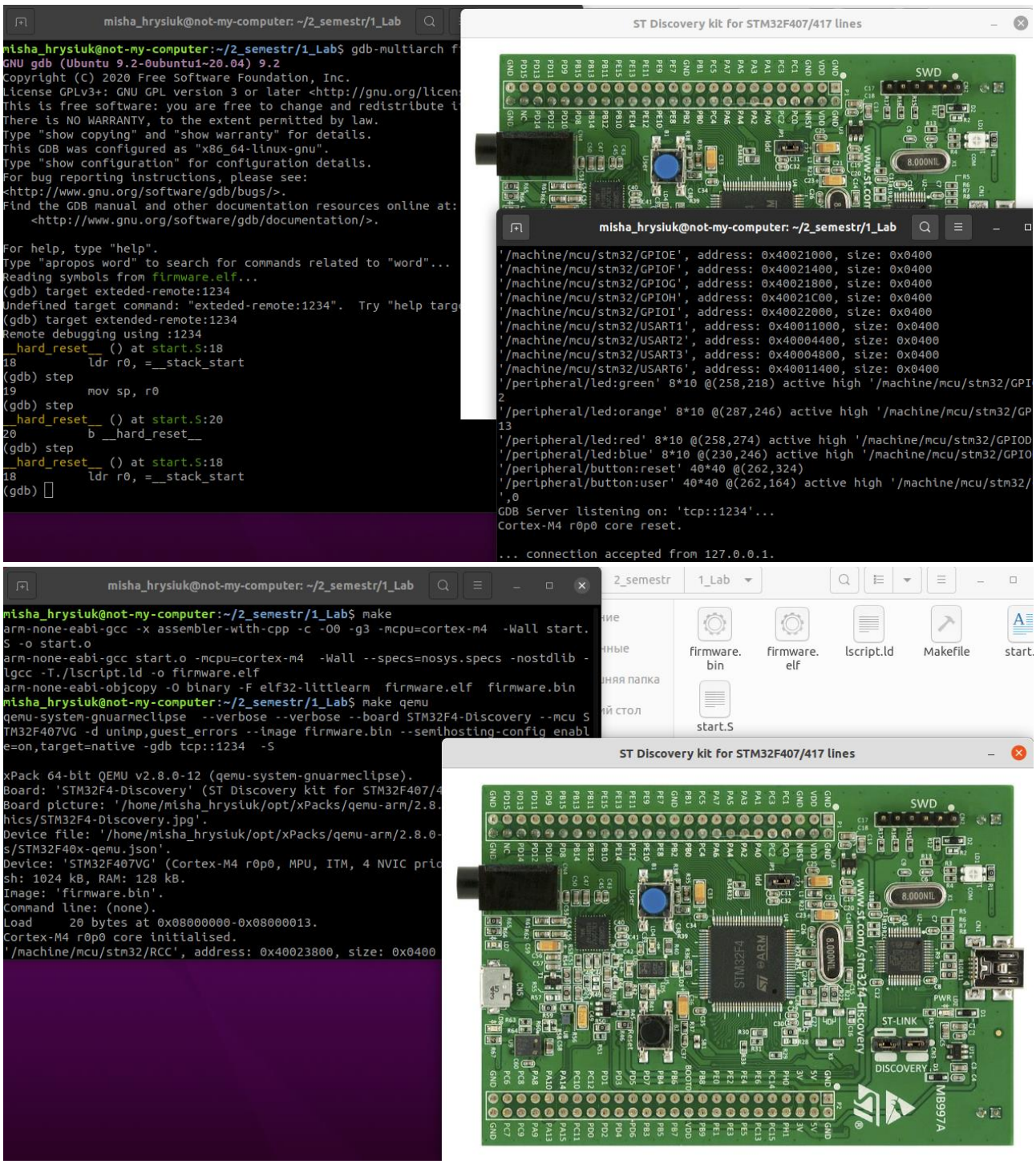
Київ - 2021 р.

Результати виконання лабораторної роботи:






misha_hrysiuk@not-my-computer: ~/2_semestr/1_Lab
misha_hrysiuk@not-my-computer:~/2_semestr/1_Lab$ gdb-multiarch f
GNU gdb (Ubuntu 9.2-0ubuntu1~20.04) 9.2
Copyright (C) 2020 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licens
This is free software: you are free to change and redistribute i
There is NO WARRANTY, to the extent permitted by law.
Type "show copying" and "show warranty" for details.
This GDB was configured as "x86_64-linux-gnu".
Type "show configuration" for configuration details.
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>.
Find the GDB manual and other documentation resources online at:
<http://www.gnu.org/software/gdb/documentation/>.
For help, type "help".
Type "apropos word" to search for commands related to "word"...
Reading symbols from firmware.elf...
(gdb) target exteded-remote:1234
Undefined target command: "exteded-remote:1234". Try "help targ
(gdb) target extended-remote:1234
Remote debugging using :1234
__hard_reset__ () at start.S:18
18 ldr r0, =__stack_start
(gdb) step
19 mov sp, r0
(gdb) step
__hard_reset__ () at start.S:20
20 b __hard_reset__
(gdb) step
__hard_reset__ () at start.S:18
18 ldr r0, =__stack_start
(gdb)
ST Discovery kit for STM32F407/417 lines
SWD
8.000MHz
misha_hrysiuk@not-my-computer: ~/2_semestr/1_Lab
'/machine/mcu/stm32/GPIOE', address: 0x40021000, size: 0x0400
'/machine/mcu/stm32/GPIOF', address: 0x40021400, size: 0x0400
'/machine/mcu/stm32/GPIOG', address: 0x40021800, size: 0x0400
'/machine/mcu/stm32/GPIOH', address: 0x40021C00, size: 0x0400
'/machine/mcu/stm32/GPIOI', address: 0x40022000, size: 0x0400
'/machine/mcu/stm32/USART1', address: 0x40011000, size: 0x0400
'/machine/mcu/stm32/USART2', address: 0x40004400, size: 0x0400
'/machine/mcu/stm32/USART3', address: 0x40004800, size: 0x0400
'/machine/mcu/stm32/USART6', address: 0x40011400, size: 0x0400
'/peripheral/led:green' 8*10 @(258,218) active high '/machine/mcu/stm32/GPI
2
'/peripheral/led:orange' 8*10 @(287,246) active high '/machine/mcu/stm32/GP
13
'/peripheral/led:red' 8*10 @(258,274) active high '/machine/mcu/stm32/GPIOD
'/peripheral/led:blue' 8*10 @(230,246) active high '/machine/mcu/stm32/GPIO
'/peripheral/button:reset' 40*40 @(262,324)
'/peripheral/button:user' 40*40 @(262,164) active high '/machine/mcu/stm32/
',0
GDB Server listening on: 'tcp::1234'...
Cortex-M4 r0p0 core reset.
... connection accepted from 127.0.0.1.
misha_hrysiuk@not-my-computer: ~/2_semestr/1_Lab
misha_hrysiuk@not-my-computer:~/2_semestr/1_Lab$ make
arm-none-eabi-gcc -x assembler-with-cpp -c -O0 -g3 -mcpu=cortex-m4 -Wall start.
S -o start.o
arm-none-eabi-gcc start.o -mcpu=cortex-m4 -Wall --specs=nosys.specs -nostdlib -
lgcc -T./lscript.ld -o firmware.elf
arm-none-eabi-objcopy -O binary -F elf32-littlearm firmware.elf firmware.bin
misha_hrysiuk@not-my-computer:~/2_semestr/1_Lab$ make qemu
qemu-system-gnuarmeclipse --verbose --verbose --board STM32F4-Discovery --mcu S
TM32F407VG -d unimp,guest_errors --image firmware.bin --semihosting-config enabl
e=on,target=native -gdb tcp::1234 -S
xPack 64-bit QEMU v2.8.0-12 (qemu-system-gnuarmeclipse).
Board: 'STM32F4-Discovery' (ST Discovery kit for STM32F407/4
Board picture: '/home/misha_hrysiuk/opt/xPacks/qemu-arm/2.8.
hics/STM32F4-Discovery.jpg'.
Device file: '/home/misha_hrysiuk/opt/xPacks/qemu-arm/2.8.0-
s/STM32F40x-qemu.json'.
Device: 'STM32F407VG' (Cortex-M4 r0p0, MPU, ITM, 4 NVIC pric
sh: 1024 kB, RAM: 128 kB.
Image: 'firmware.bin'.
Command line: (none).
Load 20 bytes at 0x08000000-0x08000013.
Cortex-M4 r0p0 core initialised.
'/machine/mcu/stm32/RCC', address: 0x40023800, size: 0x0400
2_semestr
1_Lab
firmware.bin
firmware.elf
lscript.ld
Makefile
start.S
ST Discovery kit for STM32F407/417 lines
SWD
8.000MHz
ST-LINK
DISCOVERY
PWR