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***************Draft***************

                    Rp2040 FreeRTOS

                     Using VSCode

    This project povides an example of generating a library for the pico

                       01/17/22

                ***************Draft***************
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https://learnembeddedsystems.co.uk/freertos-on-rp2040-boards-pi-pico-etc-using-vscode

https://www.youtube.com/watch?v=jCZxStjzGA8

git clone --recurse-submodules https://github.com/LearnEmbeddedSystems/rp2040-freertos-project

After forking the above project

git clone --recurse-submodules git clone --recurse-submodules
git@github.com:develone/rp2040-freertos-project.git

For this project the pico-sdk is required at same level as freertos

git clone https://github.com/raspberrypi/pico-sdk

cd pico-sdk

git submodule update --init

/home/devel/rp2040-freertos-project

CMakeLists.txt doc freertos pico-sdk pico_sdk_import.cmake ProjectFiles

mkdir build

cd build/

 cmake ..

 cd freertos/

 make clean; make

export PATH=~/local/openocd/bin:$PATH

cd rp2040-freertos-project/build/ProjectFiles

rp2040-freertos-project/build/ProjectFiles

openocd -f interface/raspberrypi-swd.cfg -f target/rp2040.cfg -c "program
ProjectFiles/blink.elf verify reset exit"

Appendix C Results devel@pi4-23:~/rp2040-freertos-project/build/ProjectFiles $ make clean; make

Appendix B Results of make clean; make for freertos.

Appendix A Results of git clone --recurse-submodules git@github.com/develone/rp2040-freertos-project

Cloning into 'rp2040-freertos-project'...

remote: Enumerating objects: 14, done.

remote: Counting objects: 100% (14/14), done.

remote: Compressing objects: 100% (12/12), done.

remote: Total 14 (delta 2), reused 13 (delta 1), pack-reused 0

Receiving objects: 100% (14/14), done.

Resolving deltas: 100% (2/2), done.

Submodule 'freertos/FreeRTOS-Kernel' (https://github.com/FreeRTOS/FreeRTOS-Kernel) registered for path 'freertos/FreeRTOS-Kernel'

Cloning into '/home/devel/rp2040-freertos-project/freertos/FreeRTOS-Kernel'...

remote: Enumerating objects: 160684, done.

remote: Counting objects: 100% (94/94), done.

remote: Compressing objects: 100% (73/73), done.

remote: Total 160684 (delta 41), reused 50 (delta 21), pack-reused 160590

Receiving objects: 100% (160684/160684), 108.59 MiB | 9.38 MiB/s, done.

Resolving deltas: 100% (115585/115585), done.

Submodule path 'freertos/FreeRTOS-Kernel': checked out '990643ebe8c990dd3672a52079d274e7685df980'

Submodule 'ThirdParty/FreeRTOS-Kernel-Community-Supported-Ports' (https://github.com/FreeRTOS/FreeRTOS-Kernel-Community-Supported-Ports) registered for path 'freertos/FreeRTOS-Kernel/portable/ThirdParty/Community-Supported-Ports'

Submodule 'ThirdParty/FreeRTOS-Kernel-Partner-Supported-Ports' (https://github.com/FreeRTOS/FreeRTOS-Kernel-Partner-Supported-Ports) registered for path 'freertos/FreeRTOS-Kernel/portable/ThirdParty/Partner-Supported-Ports'

Cloning into '/home/devel/rp2040-freertos-project/freertos/FreeRTOS-Kernel/portable/ThirdParty/Community-Supported-Ports'...

remote: Enumerating objects: 46, done.

remote: Counting objects: 100% (46/46), done.

remote: Compressing objects: 100% (38/38), done.

remote: Total 46 (delta 7), reused 40 (delta 5), pack-reused 0

Receiving objects: 100% (46/46), 34.18 KiB | 2.85 MiB/s, done.

Resolving deltas: 100% (7/7), done.

Cloning into
'/home/devel/rp2040-freertos-project/freertos/FreeRTOS-Kernel/portable/
ThirdParty/Partner-Supported-Ports'...

remote: Enumerating objects: 36, done.

remote: Counting objects: 100% (36/36), done.

remote: Compressing objects: 100% (27/27), done.

remote: Total 36 (delta 13), reused 28 (delta 9), pack-reused 0

Receiving objects: 100% (36/36), 17.62 KiB | 1.76 MiB/s, done.

Resolving deltas: 100% (13/13), done.

Submodule path 'freertos/FreeRTOS-Kernel/portable/ThirdParty/Community-
Supported-Ports': checked out 'f0618d9e2f4c5b0a3e472a2673a090e8ef836258'

Submodule path 'freertos/FreeRTOS-Kernel/portable/ThirdParty/Partner-Supported-
Ports': checked out '3f9c99a682c5c796bb7eb89fd9c4385688fce27a'

Appendix B Results of maka clean; make for freertos.

[11%] Building C object
freertos/CMakeFiles/freertos.dir/FreeRTOS-Kernel/event_groups.c.obj

[22%] Building C object
freertos/CMakeFiles/freertos.dir/FreeRTOS-Kernel/list.c.obj

[33%] Building C object
freertos/CMakeFiles/freertos.dir/FreeRTOS-Kernel/queue.c.obj

[44%] Building C object
freertos/CMakeFiles/freertos.dir/FreeRTOS-Kernel/stream_buffer.c.obj

[55%] Building C object
freertos/CMakeFiles/freertos.dir/FreeRTOS-Kernel/tasks.c.obj

[66%] Building C object
freertos/CMakeFiles/freertos.dir/FreeRTOS-Kernel/timers.c.obj

[77%] Building C object
freertos/CMakeFiles/freertos.dir/FreeRTOS-Kernel/portable/MemMang/heap_3.c.obj

[88%] Building C object
freertos/CMakeFiles/freertos.dir/FreeRTOS-Kernel/portable/GCC/ARM_CM0/port.c.obj

[100%] Linking C static library libfreertos.a

[100%] Built target freertos

Appendix C Results devel@pi4-23:~/rp2040-freertos-project/build/ProjectFiles $ make clean; make

Scanning dependencies of target ELF2UF2Build

[1%] Creating directories for 'ELF2UF2Build'

[2%] No download step for 'ELF2UF2Build'

[4%] No update step for 'ELF2UF2Build'

[5%] No patch step for 'ELF2UF2Build'

[7%] Performing configure step for 'ELF2UF2Build'

-- The C compiler identification is GNU 10.2.1

-- The CXX compiler identification is GNU 10.2.1

-- Detecting C compiler ABI info

-- Detecting C compiler ABI info - done

-- Check for working C compiler: /usr/bin/cc - skipped

-- Detecting C compile features

-- Detecting C compile features - done

-- Detecting CXX compiler ABI info

-- Detecting CXX compiler ABI info - done

-- Check for working CXX compiler: /usr/bin/c++ - skipped

-- Detecting CXX compile features

-- Detecting CXX compile features - done

-- Configuring done

-- Generating done

-- Build files have been written to: /home/devel/rp2040-freertos-project/build/elf2uf2

[8%] Performing build step for 'ELF2UF2Build'

Scanning dependencies of target elf2uf2

[50%] Building CXX object CMakeFiles/elf2uf2.dir/main.cpp.o

[100%] Linking CXX executable elf2uf2

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[100%] Built target elf2uf2

[ 10%] No install step for 'ELF2UF2Build'

[ 11%] Completed 'ELF2UF2Build'

[ 11%] Built target ELF2UF2Build

Scanning dependencies of target bs2_default

[ 13%] Building ASM object
pico-sdk/src/rp2_common/boot_stage2/CMakeFiles/bs2_default.dir/compile_time_choi
ce.S.obj

[ 14%] Linking ASM executable bs2_default.elf

[ 14%] Built target bs2_default

Scanning dependencies of target bs2_default_padded_checksummed_asm

[ 16%] Generating bs2_default.bin

[ 17%] Generating bs2_default_padded_checksummed.S

[ 17%] Built target bs2_default_padded_checksummed_asm

[ 30%] Built target freertos

Scanning dependencies of target blink

[ 32%] Building C object ProjectFiles/CMakeFiles/blink.dir/main.c.obj

[ 33%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_stdlib/
stdlib.c.obj

[ 35%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/hardware_gpio/
gpio.c.obj

[ 36%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/hardware_claim/
claim.c.obj

[ 38%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_platform/
platform.c.obj

[ 39%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/hardware_sync/
sync.c.obj

[ 41%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/hardware_uart/
uart.c.obj

[ 42%] Building ASM object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/hardware_divider/
divider.S.obj
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[ 44%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/common/pico_time/time.c.obj

[ 45%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/common/pico_time/
timeout_helper.c.obj

[ 47%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/hardware_timer/
timer.c.obj

[ 48%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/common/pico_sync/sem.c.obj

[ 50%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/common/pico_sync/
lock_core.c.obj

[ 51%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/common/pico_sync/mutex.c.obj

[ 52%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/common/pico_sync/
critical_section.c.obj

[ 54%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/common/pico_util/
datetime.c.obj

[ 55%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/common/pico_util/pheap.c.obj

[ 57%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/common/pico_util/queue.c.obj

[ 58%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_runtime/
runtime.c.obj

[ 60%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/hardware_clocks/
clocks.c.obj

[ 61%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/hardware_irq/
irq.c.obj

[ 63%] Building ASM object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/hardware_irq/
irq_handler_chain.S.obj

[ 64%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/hardware_pll/
pll.c.obj

[ 66%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/hardware_vreg/
vreg.c.obj
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[ 67%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/hardware_watchdog/
watchdog.c.obj

[ 69%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/hardware_xosc/
xosc.c.obj

[ 70%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_printf/
printf.c.obj

[ 72%] Building ASM object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_bit_ops/
bit_ops_aeabi.S.obj

[ 73%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_bootrom/
bootrom.c.obj

[ 75%] Building ASM object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_divider/
divider.S.obj

[ 76%] Building ASM object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_double/
double_aeabi.S.obj

[ 77%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_double/
double_init_rom.c.obj

[ 79%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_double/
double_math.c.obj

[ 80%] Building ASM object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_double/
double_v1_rom_shim.S.obj

[ 82%] Building ASM object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_int64_ops/
pico_int64_ops_aeabi.S.obj

[ 83%] Building ASM object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_float/
float_aeabi.S.obj

[ 85%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_float/
float_init_rom.c.obj

[ 86%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_float/
float_math.c.obj

[ 88%] Building ASM object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_float/
float_v1_rom_shim.S.obj
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[ 89%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_malloc/
pico_malloc.c.obj

[ 91%] Building ASM object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_mem_ops/
mem_ops_aeabi.S.obj

[ 92%] Building ASM object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_standard_link
/crt0.S.obj

[ 94%] Building CXX object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_standard_link
/new_delete.cpp.obj

[ 95%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_standard_link
/binary_info.c.obj

[ 97%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_stdio/
stdio.c.obj

[ 98%] Building C object
ProjectFiles/CMakeFiles/blink.dir/opt/pico-sdk/src/rp2_common/pico_stdio_uart/
stdio_uart.c.obj

[100%] Linking CXX executable blink.elf

[100%] Built target blink
```