实验报告：pintos 修改 testcase 实验

课程名称：操作系统实践	**年级**：大二	**上机实践成绩**：
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上机实践名称：Pintos 安装	**学号:10235101487**	**上机实践日期**：2024.10
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一、目的

在 **pintos 修改 testcase，新增 helloworld** 测试用例，给出 **pintos -- -q run hello-world** 的结果，给出 **make check 通过 hello-world** 测试的结果。

仓库地址 https://github.com/Xcroi-Zheng/OS.git 包含修改的文件

二、内容与设计思想

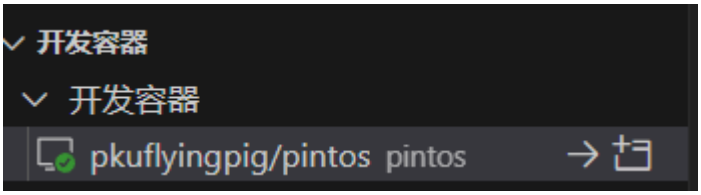
利用 vscode 中的 remote 插件链接 pintos，并编写代码完成实验。

三、使用环境

Vscode，Shell，docker

四、实验过程

1.连接虚拟机

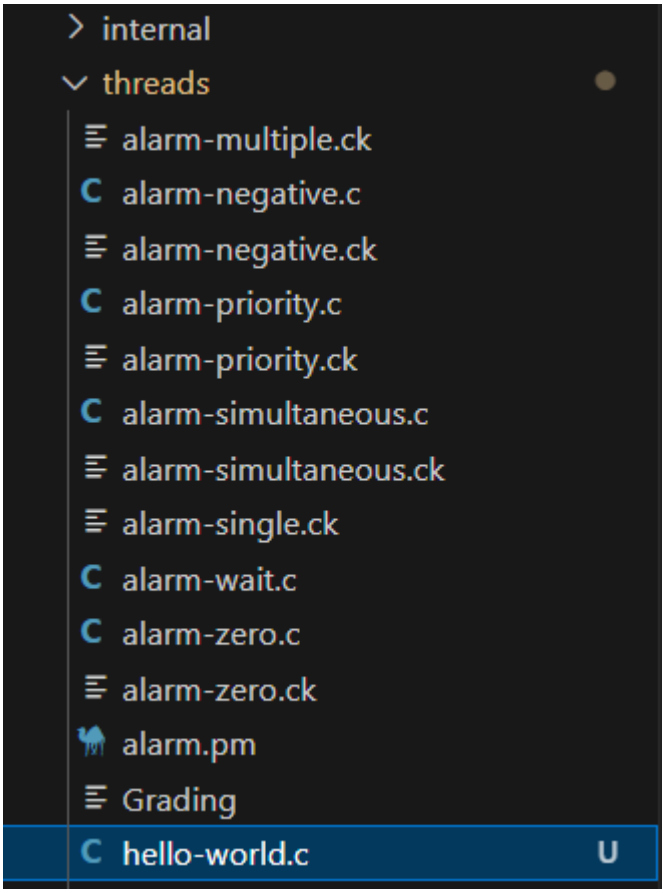


打开容器后点击右箭头即可连接

2. 修改、新增 testcase

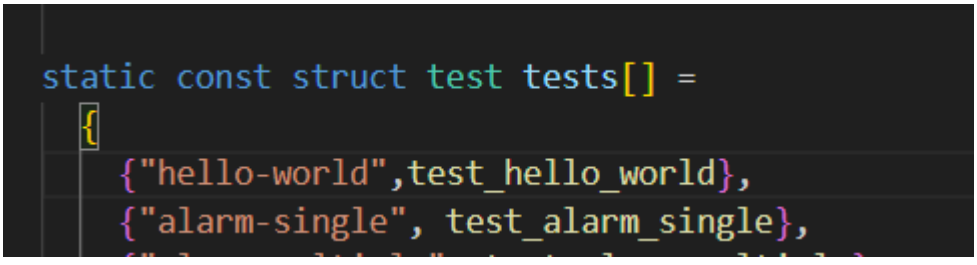
在 **src/test/threads** 下新增想要的测试文件

以 **helloworld** 为例，新增 **src/test/threads/helloworld.c**



3. 编写 hello-world.c

4. test.c 和 test.h 将新增的 helloworld 函数引入



```
typedef void test_func (void);

extern test_func test_hello_world;
extern test_func test_alarm_single;
extern test_func test_alarm_multiple;
extern test_func test_alarm_simultaneous;
```

5.修改 Make.tests

在 tests/threads_TESTS 变量下添加后缀，即增加一个名为“hello-world”的测试，反斜杠代表不换行

在 tests/threads_SRC += 后添加 hello-world.c，告诉编译器源码在哪个文件里编译

```
# Test names.
tests/threads_TESTS = $(addprefix tests/threads/,alarm-single       \
hello-world     \
alarm-multiple alarm-simultaneous alarm-priority alarm-zero     \
alarm-negative priority-change priority-donate-one          \
priority-donate-multiple priority-donate-multiple2          \
priority-donate-nest priority-donate-sema priority-donate-lower     \
priority-fifo priority-preempt priority-sema priority-condvar       \
priority-donate-chain                                               \
mlfqs-load-1 mlfqs-load-60 mlfqs-load-avg mlfqs-recent-1 mlfqs-fair-2   \
mlfqs-fair-20 mlfqs-nice-2 mlfqs-nice-10 mlfqs-block)

# Sources for tests.
tests/threads_SRC  = tests/threads/tests.c
tests/threads_SRC += tests/threads/alarm-wait.c
tests/threads_SRC += tests/threads/alarm-simultaneous.c
tests/threads_SRC += tests/threads/alarm-priority.c
tests/threads_SRC += tests/threads/alarm-zero.c
tests/threads_SRC += tests/threads/alarm-negative.c
tests/threads_SRC += tests/threads/priority-change.c
tests/threads_SRC += tests/threads/priority-donate-one.c
tests/threads_SRC += tests/threads/priority-donate-multiple.c
tests/threads_SRC += tests/threads/priority-donate-multiple2.c
tests/threads_SRC += tests/threads/priority-donate-nest.c
tests/threads_SRC += tests/threads/priority-donate-sema.c
tests/threads_SRC += tests/threads/priority-donate-lower.c
tests/threads_SRC += tests/threads/priority-fifo.c
tests/threads_SRC += tests/threads/priority-preempt.c
tests/threads_SRC += tests/threads/priority-sema.c
tests/threads_SRC += tests/threads/priority-condvar.c
tests/threads_SRC += tests/threads/priority-donate-chain.c
tests/threads_SRC += tests/threads/mlfqs-load-1.c
tests/threads_SRC += tests/threads/mlfqs-load-60.c
tests/threads_SRC += tests/threads/mlfqs-load-avg.c
tests/threads_SRC += tests/threads/mlfqs-recent-1.c
tests/threads_SRC += tests/threads/mlfqs-fair.c
tests/threads_SRC += tests/threads/mlfqs-block.c
tests/threads_SRC += tests/threads/hello-world.c
```

6. /pintos/src/threads 里重新 make，然后执行 pintos -- -q run hello-world

```
root@c1b397243101:~/pintos/src/threads# pintos -- -q run hello-world
qemu-system-i386 -device isa-debug-exit -drive format=raw,media=disk,index=0,file=/tmp/2pfqrg7DxQ.dsk -m 4 -net none
graphic -monitor null
Pintos hda1
Loading...........
Kernel command line: -q run hello-world
Pintos booting with 3,968 kB RAM...
367 pages available in kernel pool.
367 pages available in user pool.
Calibrating timer...  157,081,600 loops/s.
Boot complete.
Executing 'hello-world':
(hello-world) begin
hello world!
(hello-world) end
Execution of 'hello-world' complete.
Timer: 23 ticks
Thread: 0 idle ticks, 23 kernel ticks, 0 user ticks
Console: 385 characters output
Keyboard: 0 keys pressed
Powering off...
```

7.编写检查文件

src/test/threads/新建 hello-world.ck 文件：

pintos 的测试检查使用 perl 脚本语言

了解详细信息

C hello-world.c ~/.../tests/... U　　hello-world.ck U ×　　C h

pintos > src > tests > threads > hello-world.ck

```
1   # -*- perl -*-
2   use strict;
3   use warnings;
4   use tests::tests;
5   check_expected ([<<'EOF']);
6   (hello-world) begin
7   hello world!
8   (hello-world) end
9   EOF
10  pass;
```

测试结果

```
pass tests/threads/hello-world
pintos -v -k -T 60 --bochs  -- -q  run alarm-multiple < /dev/null 2> tests/threads/alarm-multiple.errors > tests/threads
/alarm-multiple.output
perl -I../.. ../../tests/threads/alarm-multiple.ck tests/threads/alarm-multiple tests/threads/alarm-multiple.result
```

四、总结

本次实验学习了如何在 pintos 中修改、新增 testcase