

Operating System Project #4

2017012351 이영섭

내용

1. 스레드풀 알고리즘
2. 컴파일 화면캡처
3. 실행 결과물

알고리즘

구조체 정의

queue라는 구조체를 따로 정의하여 queue.front, queue.rear를 통해 원형 버퍼를 구현

initQueue

- queue의 front값과 rear값을 둘 다 0으로 초기화하는 함수

isFull

- 원형 버퍼가 가득찼는지 확인하는 함수

isEmpty

- 원형 버퍼가 비었는지 확인하는 함수

enqueue

1. 먼저 isFull을 통해 queue가 가득 찼는지 확인하고
2. 가득 찼으면 1을 return한다.
3. 그렇지 않으면 worktodo의 맨 뒤에 task_t를 넣고
4. queue.rear를 1씩 늘려주고 0을 return한다.

dequeue

1. 먼저 isEmpty를 통해 queue가 비었는지 확인하고
2. 비어 있으면 1을 return한다.
3. 그렇지 않으면 worktodo의 맨 앞의 task_t의 함수와 인자를 t에 넣고
4. queue.front를 1 늘려주고 0을 return한다.

worker

1. queue의 task_t를 받아올 work라는 구조체를 만들고 메모리를 할당한다.
2. while문을 반복하면서 semaphore 값을 1씩 줄이고
3. mutex_lock을 걸어 dequeue를 단독 실행 되게 만든 뒤
4. queue가 비어 있으면 넘어가고 비어 있지 않으면 안에 있는 함수를 실행한다.

pool_submit

1. mutex_lock을 통해 단독 실행을 보장해준 후, 입력 받은 입력 값을 queue에 넣는다.
2. semaphore를 1 늘려준다.
3. enqueue에 성공했으면 return값을 ret라는 인자에 담아 return해준다.

pool_init

1. mutex_lock 초기화
2. queue 초기화
3. semaphore 초기화
4. 스레드 생성

pool_shutdown

1. 스레드 취소 및 종료
2. mutex_lock 해제
3. semaphore 해제

컴파일 화면캡처

```
make
gcc -Wall -v -c client.c -lthread
Apple clang version 12.0.0 (clang-1200.0.32.27)
Target: x86_64-apple-darwin20.3.0
Thread model: posix
InstalledDir: /Library/Developer/CommandLineTools/usr/bin
clang -xclang -lthread: 'linker' input unused [-Wunused-command-line-argument]
"/Library/Developer/CommandLineTools/usr/bin/clang" -cc1 -triple x86_64-apple-macosx11.0.0 -mdispatched-objc-isa-usage -Werror-deprecated-objc-isa-usage -Werror-implicit-function-declaration -emit-obj -relax-all -disable-free -disable-llvm-verifier
-discard-value-names -main-file-name client.c -mrelocation-model pic -pic-level 2 -mthread-model posix -mframe-pointer=all -fno-strict-return -masm-verbose -munwind-tables -target-sdk-version=11.0 -target-cpu penryn -dwarf-column-info -debugger-tuning
-lldb -target-linker-version 690.6 -v -resource-dir /Library/Developer/CommandLineTools/usr/lib/clang/12.0.0 -isysroot /Library/Developer/CommandLineTools/SDKs/MacOSX.sdk -I/usr/local/include -internal-isystem /Library/Developer/CommandLineTools/SDKs/MacOSX.sdk/usr/local/include -internal-isystem /Library/Developer/CommandLineTools/usr/lib/clang/12.0.0/include -internal-externc-isystem /Library/Developer/CommandLineTools/SDKs/MacOSX.sdk/usr/include -internal-externc-isystem /Library/Developer/CommandLineTools/SDKs/MacOSX.sdk/System/Library/Frameworks (framework directory)
-ignoring nonexistent directory "/Library/Developer/CommandLineTools/SDKs/MacOSX.sdk/usr/local/include"
-ignoring nonexistent directory "/Library/Developer/CommandLineTools/SDKs/MacOSX.sdk/Library/Frameworks"
#include "...": search starts here:
#include <...> search starts here:
/usr/local/include
/Library/Developer/CommandLineTools/usr/lib/clang/12.0.0/include
/Library/Developer/CommandLineTools/SDKs/MacOSX.sdk/usr/include
/Library/Developer/CommandLineTools/usr/include
/Library/Developer/CommandLineTools/SDKs/MacOSX.sdk/System/Library/Frameworks (framework directory)
End of search list.
gcc -Wall -v -c threadpool.c -lthread
Apple clang version 12.0.0 (clang-1200.0.32.27)
Target: x86_64-apple-darwin20.3.0
Thread model: posix
InstalledDir: /Library/Developer/CommandLineTools/usr/bin
clang -xclang -lthread: 'linker' input unused [-Wunused-command-line-argument]
"/Library/Developer/CommandLineTools/usr/bin/clang" -cc1 -triple x86_64-apple-macosx11.0.0 -mdispatched-objc-isa-usage -Werror-deprecated-objc-isa-usage -Werror-implicit-function-declaration -emit-obj -relax-all -disable-free -disable-llvm-verifier
-discard-value-names -main-file-name threadpool.c -mrelocation-model pic -pic-level 2 -mthread-model posix -mframe-pointer=all -fno-strict-return -masm-verbose -munwind-tables -target-sdk-version=11.0 -target-cpu penryn -dwarf-column-info -debugger-tuning-lldb
-target-linker-version 690.6 -v -resource-dir /Library/Developer/CommandLineTools/usr/lib/clang/12.0.0 -isysroot /Library/Developer/CommandLineTools/SDKs/MacOSX.sdk -I/usr/local/include -internal-isystem /Library/Developer/CommandLineTools/SDKs/MacOSX.sdk/usr/local/include -internal-isystem /Library/Developer/CommandLineTools/SDKs/MacOSX.sdk/System/Library/Frameworks (framework directory)
-ignoring nonexistent directory "/Library/Developer/CommandLineTools/SDKs/MacOSX.sdk/usr/local/include"
-ignoring nonexistent directory "/Library/Developer/CommandLineTools/SDKs/MacOSX.sdk/Library/Frameworks"
#include "...": search starts here:
#include <...> search starts here:
/usr/local/include
/Library/Developer/CommandLineTools/usr/lib/clang/12.0.0/include
/Library/Developer/CommandLineTools/SDKs/MacOSX.sdk/usr/include
/Library/Developer/CommandLineTools/usr/include
/Library/Developer/CommandLineTools/SDKs/MacOSX.sdk/System/Library/Frameworks (framework directory)
End of search list.
gcc -Wall -v -o client.o threadpool.o -lthread
Apple clang version 12.0.0 (clang-1200.0.32.27)
Target: x86_64-apple-darwin20.3.0
Thread model: posix
InstalledDir: /Library/Developer/CommandLineTools/usr/bin
"/Library/Developer/CommandLineTools/usr/bin/ld" -demangle -lto_library /Library/Developer/CommandLineTools/usr/lib/libT0.dylib -dynamic -arch x86_64 -platform_version macos 11.0.0 11.0 -syslibroot /Library/Developer/CommandLineTools/SDKs/MacOSX.sdk
-o client -L/usr/local/lib client.o threadpool.o -lthread -lSystem /Library/Developer/CommandLineTools/usr/lib/clang/12.0.0/lib/darwin/libclang_rt.osx.o
```

실행 결과물

pool_submit(number, num+i) 실행 결과물

[illegible]

pool_submit(pooh, NULL) 실행 결과물