컴퓨터학부 20152385 송민구

1. 소스 코드

#include <stdio.h>

#include <stdlib.h>

#include <unistd.h>

#include <sys/time.h>

#include <sys/times.h>

#include <sys/wait.h>

#include "ssu\_runtime.h"

**void** ssu\_do\_cmd(**char** \*cmd);

**void** ssu\_print\_times(clock\_t real, **struct** tms \*tms\_start, **struct** tms \*tms\_end);

**void** ssu\_echo\_exit(**int** status);

**int** main(**int** argc, **char** \*argv[])

{

**int** i;

gettimeofday(&begin\_t, **NULL**);

setbuf(stdout, **NULL**); // 표준 출력의 버퍼링을 NULL로 지정

**for** (i = 1; i < argc; i++) {

ssu\_do\_cmd(argv[i]);

}

gettimeofday(&end\_t, **NULL**);

ssu\_runtime(&begin\_t, &end\_t);

exit(0);

}

**void** ssu\_do\_cmd(**char** \*cmd)

{

**struct** tms tms\_start, tms\_end;

clock\_t start, end;

**int** status;

printf("\ncommand: %s\n", cmd);

**if** ((start = times(&tms\_start)) == -1) {

fprintf(stderr, "times error\n");

exit(1);

}

**if** ((status = system(cmd)) < 0) { // system()실행

fprintf(stderr, "system error\n");

exit(1);

}

**if** ((end = times(&tms\_end)) == - 1) {

fprintf(stderr, "times error\n");

exit(1);

}

ssu\_print\_times(end-start, &tms\_start, &tms\_end);

ssu\_echo\_exit(status);

}

**void** ssu\_print\_times(clock\_t real, **struct** tms \*tms\_start, **struct** tms \*tms\_end)

{

**static** **long** clocktick = 0;

**if** (clocktick == 0) {

**if** ((clocktick = sysconf(\_SC\_CLK\_TCK)) < 0) {

fprintf(stderr, "sysconf error\n");

exit(1);

}

}

printf(" real: %7.2f\n", real / (**double**)clocktick);

printf(" user: %7.2f\n",

(tms\_end->tms\_utime - tms\_start->tms\_utime) / (**double**)clocktick);

printf(" user: %7.2f\n",

(tms\_end->tms\_stime - tms\_start->tms\_stime) / (**double**)clocktick);

printf(" user: %7.2f\n",

(tms\_end->tms\_cutime - tms\_start->tms\_cutime) / (**double**)clocktick);

printf(" user: %7.2f\n",

(tms\_end->tms\_cstime - tms\_start->tms\_cstime) / (**double**)clocktick);

}

**void** ssu\_echo\_exit(**int** status) {

**if** (WIFEXITED(status)) {

printf("normal termination, exit status = %d\n",

WEXITSTATUS(status));

}

**else** **if** (WIFSIGNALED(status)) {

printf("abnormal termination, signal number = %d%s\n",

WTERMSIG(status),

#ifdef WCOREDUMP

WCOREDUMP(status) ? " (core file generated)" : "");

#else

"");

#endif

}

**else** **if** (WIFSTOPPED(status)) {

printf("child stopped, signal number = %d\n",

WSTOPSIG(status));

}

}

1. 실행 결과

