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Институт №8 “Компьютерные науки и прикладная математика”
Кафедра №806 “Вычислительная математика и программирование”

Лабораторная работа №2 по курсу
«Операционные системы»

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Оценка: _____

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Постановка задачи

Вариант 5.

Составить программу на языке Си, обрабатывающую данные в многопоточном режиме. При обработке использовать стандартные средства создания потоков операционной системы (Windows/Unix). Ограничение максимального количества потоков, работающих в один момент времени, должно быть задано ключом запуска вашей программы. Так же необходимо уметь продемонстрировать количество потоков, используемое вашей программой с помощью стандартных средств операционной системы. В отчете привести исследование зависимости ускорения и эффективности алгоритма от входных данных и количества потоков. Получившиеся результаты необходимо объяснить.

Отсортировать массив целых чисел при помощи чётной-нечётной сортировки Бетчера.

Общий метод и алгоритм решения

Использованные системные вызовы:

- write; – записывает данные в файл.
- read - читает данные из файла
- pthread_create - создаёт поток
- pthread_join - ожидание множества потоков
- pthread_mutex_init - создание мьютекса
- pthread_mutex_destroy - уничтожение мьютекса
- pthread_mutex_lock - блокировка мьютекса
- pthread_mutex_unlock - разблокировка мьютекса
- gettimeofday - получение текущего времени (для бенчмарка)

В лабораторной работе я использовал собственную реализацию вывода строки в stdout (iolib/std_out)? которая использует системный вызов write.

В задании требуется реализовать чётную-нечётную сортировку Бетчера. Идея данный алгоритм схож с сортировкой слиянием, но в отличие от неё использует чётно-нечётные перестановки. Идея алгоритма в том, что мы последовательно рассматриваем подмассивы разных размеров, как и в сортировке слиянием, мы будем их сливать (при помощи операции compare and exchange), но в отличии от сортировки слиянием, здесь мы используем итеративный подход вместо рекурсии и вместо разбиения массива посередине, мы разбиваем массив на чётную половину и нечётную. Сам алгоритм можно описать при помощи псевдокода следующим образом:

```
for p = 1, 2, 4, 8, ... # пока p < n for k = p, p/2, p/4,
p/8, ... # пока >= 1 for j = mod(k,p) to (n-1-k) с
шагом 2k for i = 0 to min(k-1, n-j-k-1) с
единичным шагом if floor((i+j) / (p*2)) ==
floor((i+j+k) / (p*2)) compare and sort elements (i+j)
and (i+j+k)
```

Для того чтобы распараллелить данный алгоритм, вынесем цикл с переменной j в отдельную функцию, плюс будем вычислять отступ с учётом кол-ва потоков и номером текущего потока, таким образом. Для того, чтобы избежать race condition при обращении к исходному вектору, будем использовать мьютекс. Будем использовать вызов `pthread_join` для ожидания списка потоков.

Код программы

main.cpp

```
##include <vector>
#include <pthread.h>
#include <mutex>
#include <sys/time.h>
#include "iolib/std.h"

pthread_mutex_t mutex;

struct ThreadData
{ std::vector<int> *sequence; int
  n; int p; int k; int
  threadId; int numThreads;
};

void compare_and_exchange(int &a, int &b)
{ if (b < a)
  {
    std::swap(a, b); }
}

void *thread_function(void *arg)
{
  ThreadData *data = (ThreadData *)arg;
  std::vector<int> &sequence = *data->sequence;
  int n = data->n;
  int p = data->p;
  int k = data->k;
  int threadId = data->threadId;
  int numThreads = data->numThreads;

  for (int j = k % p + threadId * 2 * k; j <= n - 1 - k; j += 2 * k * numThreads)
  {
    for (int i = 0; i <= std::min(k - 1, n - j - k -
1); ++i)
    {
      pthread_mutex_lock(&mutex);
      if (std::floor((i + j) / (p * 2)) == std::floor((i + j + k) / (p * 2)))
      {
        compare_and_exchange(sequence[i + j], sequence[i + j + k]);
      }
      pthread_mutex_unlock(&mutex);
    }
  }

  pthread_exit(NULL);
}

void betcher_sort(std::vector<int> &v, int max_threads)
{ int n = v.size();
  for (int p = 1; p < n; p *= 2)
  {
    for (int k = p; k >= 1;
k /= 2)
```

```

    {
        pthread_t threads[max_threads];
        ThreadData threadData[max_threads];

        for (int t = 0; t < max_threads; ++t)
        {
            threadData[t] = {&v, n, p, k, t, max_threads};
            pthread_create(&threads[t], NULL, thread_function, (void *)&threadData[t]);
        }
        for (int t = 0; t < max_threads; ++t)
        {
            pthread_join(threads[t], NULL);
        }
    }
}

int main(int argc, char **argv)
{ if (argc != 3)
    {
        std_out("invalid number of args. enter max number of threads and array
len\n");
        return 1; }
    int max_threads = atoi(argv[1]);
    int len = atoi(argv[2]);
    std::srand(std::time(0));

    std::string buffer;
    std::vector<int> unsorted_vector(len);

    for (int i = 0; i < len; i++)
    {
        unsorted_vector[i] = std::rand()
% len;
    }
    std_out("Unsorted array:\n");
    for (int i = 0; i < len; i++)
    {
        std_out(std::to_string(unsorted_vector[i])
+ " ");
    }
    std_out("\nSorted array:\n");

    struct timeval start, end;
    pthread_mutex_init(&mutex, NULL);
    gettimeofday(&start, NULL);
    betcher_sort(unsorted_vector, max_threads);
    gettimeofday(&end, NULL);
    double time_spent = (end.tv_sec - start.tv_sec) + (end.tv_usec - start.tv_usec) / 1e6;

    for (int i = 0; i < len; i++)
    {
        std_out(std::to_string(unsorted_vector[i])
+ " ");
    }
    std_out("\n");
    std_out("Time elapsed:" + std::to_string(time_spent) + " s\n");
    pthread_mutex_destroy(&mutex);
    return 0;
}

```

#std.cpp

```
#include "std.h"

int std_in(std::string* message) { return
    file_scan(STDIN_FILENO, message);
}

void std_out(const std::string& message) { file_print(STDOUT_FILENO,
    message);
}

void log_stderr(const std::string& message) {
    file_print(STDERR_FILENO, message);
}

int file_scan(int input_file, std::string* message) {
    char buffer[DEFAULT_BUFF_SIZE];
    std::string output;
    ssize_t bytes = read(input_file, buffer, DEFAULT_BUFF_SIZE);
    for (int i = 0; i < bytes; i++) {
        output += buffer[i];
    }
    *message = output;
    return (int) bytes;
}

int file_print(int output_file, const std::string& message) { ssize_t bytes =
    write(output_file, message.c_str(), message.size()); return (int)
    bytes;
}
```

#std.h

```
#ifndef SRC_STD_H
#define SRC_STD_H

#include <string>
#include <csignal>
#include <unistd.h>

#define DEFAULT_BUFF_SIZE 1024

int std_in(std::string *); void

std_out(const std::string &); void

log_stderr(const std::string &); int
```

```

file_scan(int, std::string *); int

file_print(int, const std::string &);

#endif

```

Протокол работы программы

```

kotlasboy@kotlasboy-Modern-15-B12M:~/Programming/Projects/OS/lab_2$ strace -f ./betcher_sort 2 20
execve("./betcher_sort", [ "./betcher_sort", "2", "20"], 0x7ffe80e30358 /* 60 vars */) = 0
brk(NULL)                                = 0x635d3902e000
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7a48d7db3000
access("/etc/ld.so.preload", R_OK)       = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3
fstat(3, {st_mode=S_IFREG|0644, st_size=68847, ...}) = 0
mmap(NULL, 68847, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7a48d7da2000
close(3)                                = 0
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0644, st_size=2592224, ...}) = 0
mmap(NULL, 2609472, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7a48d7a00000
mmap(0x7a48d7a9d000, 1343488, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x9d000) =
0x7a48d7a9d000
mmap(0x7a48d7be5000, 552960, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e5000) =
0x7a48d7be5000
mmap(0x7a48d7c6c000, 57344, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x26b000) =
0x7a48d7c6c000
mmap(0x7a48d7c7a000, 12608, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) =
0x7a48d7c7a000
close(3)                                = 0
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libgcc_s.so.1", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0644, st_size=183024, ...}) = 0
mmap(NULL, 185256, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7a48d7d74000
mmap(0x7a48d7d78000, 147456, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x4000) =
0x7a48d7d78000
mmap(0x7a48d7d9c000, 16384, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x28000) =
0x7a48d7d9c000
mmap(0x7a48d7da0000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x2b000) =
0x7a48d7da0000
close(3)                                = 0
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\0\220\243\2\0\0\0\0\0"..., 832) = 832
pread64(3, "\6\0\0\0\4\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0"..., 784, 64) = 784
fstat(3, {st_mode=S_IFREG|0755, st_size=2125328, ...}) = 0
pread64(3, "\6\0\0\0\4\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0"..., 784, 64) = 784
mmap(NULL, 2170256, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7a48d7600000
mmap(0x7a48d7628000, 1605632, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x28000) =
0x7a48d7628000
mmap(0x7a48d77b0000, 323584, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1b0000) =
0x7a48d77b0000
mmap(0x7a48d77ff000, 24576, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1fe000) =
0x7a48d77ff000
mmap(0x7a48d7805000, 52624, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) =
0x7a48d7805000
close(3)                                = 0
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libm.so.6", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0644, st_size=952616, ...}) = 0
mmap(NULL, 950296, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7a48d7c8b000
mmap(0x7a48d7c9b000, 520192, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x10000) =
0x7a48d7c9b000

```

```

mmap(0x7a48d7d1a000, 360448, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x8f000) =
0x7a48d7d1a000
mmap(0x7a48d7d72000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0xe7000) =
0x7a48d7d72000
close(3) = 0
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7a48d7c89000
mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7a48d7c86000
arch_prctl(ARCH_SET_FS, 0x7a48d7c86740) = 0
set_tid_address(0x7a48d7c86a10) = 64483
set_robust_list(0x7a48d7c86a20, 24) = 0
rseq(0x7a48d7c87060, 0x20, 0, 0x53053053) = 0
mprotect(0x7a48d77ff000, 16384, PROT_READ) = 0
mprotect(0x7a48d7d72000, 4096, PROT_READ) = 0
mprotect(0x7a48d7da0000, 4096, PROT_READ) = 0
mprotect(0x7a48d7c6c000, 45056, PROT_READ) = 0
mprotect(0x635d30d40000, 4096, PROT_READ) = 0
mprotect(0x7a48d7deb000, 8192, PROT_READ) = 0
prlimit64(0, RLIMIT_STACK, NULL, {rlim_cur=8192*1024, rlim_max=RLIM64_INFINITY}) = 0
munmap(0x7a48d7da2000, 68847) = 0
futex(0x7a48d7c7a7bc, FUTEX_WAKE_PRIVATE, 2147483647) = 0
getrandom("\x19\xac\x40\x9c\xfd\xc9\x7d\x39", 8, GRND_NONBLOCK) = 8
brk(NULL) = 0x635d3902e000
brk(0x635d3904f000) = 0x635d3904f000
write(1, "Unsorted array:\n", 16Unsorted array:
) = 16
write(1, "7 ", 27 ) = 2
write(1, "0 ", 20 ) = 2
write(1, "9 ", 29 ) = 2
write(1, "17 ", 317 ) = 3
write(1, "19 ", 319 ) = 3
write(1, "9 ", 29 ) = 2
write(1, "16 ", 316 ) = 3
write(1, "14 ", 314 ) = 3
write(1, "1 ", 21 ) = 2
write(1, "8 ", 28 ) = 2
write(1, "7 ", 27 ) = 2
write(1, "3 ", 23 ) = 2
write(1, "15 ", 315 ) = 3
write(1, "1 ", 21 ) = 2
write(1, "15 ", 315 ) = 3
write(1, "5 ", 25 ) = 2
write(1, "12 ", 312 ) = 3
write(1, "12 ", 312 ) = 3
write(1, "11 ", 311 ) = 3
write(1, "17 ", 317 ) = 3
write(1, "\nSorted array:\n", 15
Sorted array:
) = 15
rt_sigaction(SIGRT_1, {sa_handler=0x7a48d7699520, sa_mask=[],
sa_flags=SA_RESTORER|SA_ONSTACK|SA_RESTART|SA_SIGINFO, sa_restorer=0x7a48d7645320}, NULL, 8) = 0
rt_sigprocmask(SIG_UNBLOCK, [RTMIN RT_1], NULL, 8) = 0
mmap(NULL, 8392704, PROT_NONE, MAP_PRIVATE|MAP_ANONYMOUS|MAP_STACK, -1, 0) = 0x7a48d6c00000
mprotect(0x7a48d6c01000, 8388608, PROT_READ|PROT_WRITE) = 0
rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d7400990, parent_tid=0x7a48d7400990,
exit_signal=0, stack=0x7a48d6c00000, stack_size=0x7fff80, tls=0x7a48d74006c0}strace: Process 64484
attached
=> {parent_tid=[64484]}, 88) = 64484
[pid 64484] rseq(0x7a48d7400fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64484] <... rseq resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64484] set_robust_list(0x7a48d74009a0, 24 <unfinished ...>

```

```

[pid 64483] mmap(NULL, 8392704, PROT_NONE, MAP_PRIVATE|MAP_ANONYMOUS|MAP_STACK, -1, 0 <unfinished ...>
[pid 64484] <... set_robust_list resumed>) = 0
[pid 64483] <... mmap resumed>) = 0x7a48d6200000
[pid 64484] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64483] mprotect(0x7a48d6201000, 8388608, PROT_READ|PROT_WRITE <unfinished ...>
[pid 64484] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64483] <... mprotect resumed>) = 0
[pid 64483] futex(0x7a48d7deda58, FUTEX_WAIT_PRIVATE, 2, NULL <unfinished ...>
[pid 64484] mmap(NULL, 134217728, PROT_NONE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7a48ce200000
[pid 64484] munmap(0x7a48ce200000, 31457280) = 0
[pid 64484] munmap(0x7a48d4000000, 35651584) = 0
[pid 64484] mprotect(0x7a48d0000000, 135168, PROT_READ|PROT_WRITE) = 0
[pid 64484] futex(0x7a48d7deda58, FUTEX_WAKE_PRIVATE, 1 <unfinished ...>
[pid 64483] <... futex resumed>) = 0
[pid 64484] <... futex resumed>) = 1
[pid 64483] futex(0x7a48d7deda58, FUTEX_WAKE_PRIVATE, 1) = 0
[pid 64484] futex(0x7a48d7da1230, FUTEX_WAKE_PRIVATE, 2147483647 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_BLOCK, ~[], <unfinished ...>
[pid 64484] <... futex resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>[], 8) = 0
[pid 64483]
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d6a00990, parent_tid=0x7a48d6a00990, exit_signal=0, stack=0x7a48d6200000, stack_size=0x7fff80, tls=0x7a48d6a006c0} <unfinished ...>
[pid 64484] rt_sigprocmask(SIG_BLOCK, ~[RT_1], NULL, 8) = 0
[pid 64484] madvise(0x7a48d6c00000, 8368128, MADV_DONTNEEDstrace: Process 64485 attached
<unfinished ...>
[pid 64483] <... clone3 resumed> => {parent_tid=[64485]}, 88) = 64485
[pid 64484] <... madvise resumed>) = 0
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64485] rseq(0x7a48d6a00fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64484] exit(0 <unfinished ...>
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64485] <... rseq resumed>) = 0
[pid 64483] futex(0x7a48d7400990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64484, NULL, FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64484] <... exit resumed>) = ?
[pid 64485] set_robust_list(0x7a48d6a009a0, 24 <unfinished ...>
[pid 64483] <... futex resumed>) = 0
[pid 64485] <... set_robust_list resumed>) = 0
[pid 64484] +++ exited with 0 +++
[pid 64483] futex(0x7a48d6a00990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64485, NULL, FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64485] rt_sigprocmask(SIG_SETMASK, [], NULL, 8) = 0
[pid 64485] rt_sigprocmask(SIG_BLOCK, ~[RT_1], NULL, 8) = 0
[pid 64485] madvise(0x7a48d6200000, 8368128, MADV_DONTNEED) = 0
[pid 64485] exit(0) = ?
[pid 64483] <... futex resumed>) = 0
[pid 64485] +++ exited with 0 +++
rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d6a00990, parent_tid=0x7a48d6a00990, exit_signal=0, stack=0x7a48d6200000, stack_size=0x7fff80, tls=0x7a48d6a006c0}strace: Process 64486 attached
=> {parent_tid=[64486]}, 88) = 64486
[pid 64486] rseq(0x7a48d6a00fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64486] <... rseq resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64483] rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0
[pid 64486] set_robust_list(0x7a48d6a009a0, 24 <unfinished ...>
[pid 64483]
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d6a00990, parent_tid=0x7a48d6a00990, exit_signal=0, stack=0x7a48d6200000, stack_size=0x7fff80, tls=0x7a48d6a006c0}strace: Process 64487 attached
=> {parent_tid=[64487]}, 88) = 64487

```



```

NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d7400990, parent_tid=0x7a48d7400990,
exit_signal=0, stack=0x7a48d6c00000, stack_size=0x7fff80, tls=0x7a48d74006c0} <unfinished ...>
[pid 64486] <... set_robust_list resumed>) = 0
[pid 64486] rt_sigprocmask(SIG_SETMASK, [], strace: Process 64487 attached
NULL, 8) = 0
[pid 64483] <... clone3 resumed> => {parent_tid=[64487]}, 88) = 64487
[pid 64487] rseq(0x7a48d7400fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64486] rt_sigprocmask(SIG_BLOCK, ~[RT_1], <unfinished ...>
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64487] <... rseq resumed>) = 0
[pid 64483] futex(0x7a48d6a00990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64486, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64486] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64487] set_robust_list(0x7a48d74009a0, 24 <unfinished ...>
[pid 64486] madvise(0x7a48d6200000, 8368128, MADV_DONTNEED <unfinished ...>
[pid 64487] <... set_robust_list resumed>) = 0
[pid 64487] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64486] <... madvise resumed>) = 0
[pid 64487] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64486] exit(0 <unfinished ...>
[pid 64487] rt_sigprocmask(SIG_BLOCK, ~[RT_1], <unfinished ...>
[pid 64486] <... exit resumed>) = ?
[pid 64487] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64486] +++ exited with 0 +++
[pid 64483] <... futex resumed>) = 0
[pid 64487] madvise(0x7a48d6c00000, 8368128, MADV_DONTNEED <unfinished ...>
[pid 64483] futex(0x7a48d7400990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64487, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64487] <... madvise resumed>) = 0
[pid 64487] exit(0) = ?
[pid 64483] <... futex resumed>) = 0
[pid 64487] +++ exited with 0 +++
rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0

```

```

clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d7400990, parent_tid=0x7a48d7400990,
exit_signal=0, stack=0x7a48d6c00000, stack_size=0x7fff80, tls=0x7a48d74006c0})strace: Process 64488
attached

```

```

=> {parent_tid=[64488]}, 88) = 64488
[pid 64488] rseq(0x7a48d7400fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64488] <... rseq resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64488] set_robust_list(0x7a48d74009a0, 24 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_BLOCK, ~[], <unfinished ...>
[pid 64488] <... set_robust_list resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>[], 8) = 0
[pid 64488] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64483]
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d6a00990, parent_tid=0x7a48d6a00990,
exit_signal=0, stack=0x7a48d6200000, stack_size=0x7fff80, tls=0x7a48d6a006c0} <unfinished ...>
[pid 64488] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64488] rt_sigprocmask(SIG_BLOCK, ~[RT_1], strace: Process 64489 attached
NULL, 8) = 0
[pid 64483] <... clone3 resumed> => {parent_tid=[64489]}, 88) = 64489
[pid 64489] rseq(0x7a48d6a00fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64488] madvise(0x7a48d6c00000, 8368128, MADV_DONTNEED <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64489] <... rseq resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64488] <... madvise resumed>) = 0
[pid 64483] futex(0x7a48d7400990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64488, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>

```

```

[pid 64489] set_robust_list(0x7a48d6a009a0, 24 <unfinished ...>
[pid 64488] exit(0 <unfinished ...>
[pid 64489] <... set_robust_list resumed>) = 0
[pid 64488] <... exit resumed>      = ?
[pid 64489] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64483] <... futex resumed>)      = 0
[pid 64488] +++ exited with 0 +++
[pid 64489] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64483] futex(0x7a48d6a00990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64489, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64489] rt_sigprocmask(SIG_BLOCK, ~[RT_1], NULL, 8) = 0
[pid 64489] madvise(0x7a48d6200000, 8368128, MADV_DONTNEED) = 0
[pid 64489] exit(0) = ?
[pid 64483] <... futex resumed>)      = 0
[pid 64489] +++ exited with 0 +++
rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d6a00990, parent_tid=0x7a48d6a00990,
exit_signal=0, stack=0x7a48d6200000, stack_size=0x7fff80, tls=0x7a48d6a006c0}strace: Process 64490
attached
=> {parent_tid=[64490]}, 88) = 64490
[pid 64490] rseq(0x7a48d6a00fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64490] <... rseq resumed>)      = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64490] set_robust_list(0x7a48d6a009a0, 24 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_BLOCK, ~[], <unfinished ...>
[pid 64490] <... set_robust_list resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>[], 8) = 0
[pid 64490] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64483]
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d7400990, parent_tid=0x7a48d7400990,
exit_signal=0, stack=0x7a48d6c00000, stack_size=0x7fff80, tls=0x7a48d74006c0} <unfinished ...>
[pid 64490] <... rt_sigprocmask resumed>NULL, 8) = 0
strace: Process 64491 attached
[pid 64490] rt_sigprocmask(SIG_BLOCK, ~[RT_1], <unfinished ...>
[pid 64483] <... clone3 resumed>=> {parent_tid=[64491]}, 88) = 64491
[pid 64491] rseq(0x7a48d7400fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64490] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64491] <... rseq resumed>)      = 0
[pid 64483] futex(0x7a48d6a00990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64490, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64490] madvise(0x7a48d6200000, 8368128, MADV_DONTNEED <unfinished ...>
[pid 64491] set_robust_list(0x7a48d74009a0, 24 <unfinished ...>
[pid 64490] <... madvise resumed>)      = 0
[pid 64491] <... set_robust_list resumed>) = 0
[pid 64490] exit(0 <unfinished ...>
[pid 64491] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64490] <... exit resumed>)      = ?
[pid 64491] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64483] <... futex resumed>)      = 0
[pid 64490] +++ exited with 0 +++
[pid 64491] rt_sigprocmask(SIG_BLOCK, ~[RT_1], <unfinished ...>
[pid 64483] futex(0x7a48d7400990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64491, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64491] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64491] madvise(0x7a48d6c00000, 8368128, MADV_DONTNEED) = 0
[pid 64491] exit(0) = ?
[pid 64483] <... futex resumed>)      = 0
[pid 64491] +++ exited with 0 +++
rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0

```

```
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d7400990, parent_tid=0x7a48d7400990, exit_signal=0, stack=0x7a48d6c00000, stack_size=0x7fff80, tls=0x7a48d74006c0})strace: Process 64492 attached
```

```
=> {parent_tid=[64492]}, 88) = 64492
[pid 64492] rseq(0x7a48d7400fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64492] <... rseq resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64492] set_robust_list(0x7a48d74009a0, 24 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_BLOCK, ~[], <unfinished ...>
[pid 64492] <... set_robust_list resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>[], 8) = 0
[pid 64492] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64483]
```

```
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d6a00990, parent_tid=0x7a48d6a00990, exit_signal=0, stack=0x7a48d6200000, stack_size=0x7fff80, tls=0x7a48d6a006c0}) <unfinished ...>
[pid 64492] <... rt_sigprocmask resumed>NULL, 8) = 0
```

strace: Process 64493 attached

```
[pid 64492] rt_sigprocmask(SIG_BLOCK, ~[RT_1], <unfinished ...>
[pid 64483] <... clone3 resumed> => {parent_tid=[64493]}, 88) = 64493
[pid 64493] rseq(0x7a48d6a00fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64492] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64493] <... rseq resumed>) = 0
[pid 64483] futex(0x7a48d7400990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64492, NULL, FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64492] madvise(0x7a48d6c00000, 8368128, MADV_DONTNEED <unfinished ...>
[pid 64493] set_robust_list(0x7a48d6a009a0, 24) = 0
[pid 64492] <... madvise resumed>) = 0
[pid 64493] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64492] exit(0 <unfinished ...>
[pid 64493] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64492] <... exit resumed>) = ?
[pid 64493] rt_sigprocmask(SIG_BLOCK, ~[RT_1], <unfinished ...>
[pid 64483] <... futex resumed>) = 0
[pid 64492] +++ exited with 0 +++
[pid 64493] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64483] futex(0x7a48d6a00990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64493, NULL, FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64493] madvise(0x7a48d6200000, 8368128, MADV_DONTNEED) = 0
[pid 64493] exit(0) = ?
[pid 64483] <... futex resumed>) = 0
[pid 64493] +++ exited with 0 +++
rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0
```

```
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d6a00990, parent_tid=0x7a48d6a00990, exit_signal=0, stack=0x7a48d6200000, stack_size=0x7fff80, tls=0x7a48d6a006c0})strace: Process 64494 attached
```

```
=> {parent_tid=[64494]}, 88) = 64494
[pid 64494] rseq(0x7a48d6a00fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64494] <... rseq resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64494] set_robust_list(0x7a48d6a009a0, 24 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_BLOCK, ~[], <unfinished ...>
[pid 64494] <... set_robust_list resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>[], 8) = 0
[pid 64494] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64483]
```

```
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d6a00990, parent_tid=0x7a48d6a00990, exit_signal=0, stack=0x7a48d6200000, stack_size=0x7fff80, tls=0x7a48d6a006c0})strace: Process 64495 attached
```

```
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d7400990, parent_tid=0x7a48d7400990,
exit_signal=0, stack=0x7a48d6c00000, stack_size=0x7fff80, tls=0x7a48d74006c0} <unfinished ...>
```

```
[pid 64494] <... rt_sigprocmask resumed>NULL, 8) = 0
```

```
strace: Process 64495 attached
```

```
[pid 64494] rt_sigprocmask(SIG_BLOCK, ~[RT_1], <unfinished ...>
```

```
[pid 64483] <... clone3 resumed> => {parent_tid=[64495]}, 88) = 64495
```

```
[pid 64495] rseq(0x7a48d7400fe0, 0x20, 0, 0x53053053 <unfinished ...>
```

```
[pid 64494] <... rt_sigprocmask resumed>NULL, 8) = 0
```

```
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
```

```
[pid 64495] <... rseq resumed> = 0
```

```
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
```

```
[pid 64494] madvise(0x7a48d6200000, 8368128, MADV_DONTNEED <unfinished ...>
```

```
[pid 64483] futex(0x7a48d6a00990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64494, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
```

```
[pid 64495] set_robust_list(0x7a48d74009a0, 24 <unfinished ...>
```

```
[pid 64494] <... madvise resumed> = 0
```

```
[pid 64495] <... set_robust_list resumed> = 0
```

```
[pid 64494] exit(0 <unfinished ...>
```

```
[pid 64495] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
```

```
[pid 64494] <... exit resumed> = ?
```

```
[pid 64495] <... rt_sigprocmask resumed>NULL, 8) = 0
```

```
[pid 64483] <... futex resumed> = 0
```

```
[pid 64494] +++ exited with 0 +++
```

```
[pid 64495] rt_sigprocmask(SIG_BLOCK, ~[RT_1], <unfinished ...>
```

```
[pid 64483] futex(0x7a48d7400990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64495, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
```

```
[pid 64495] <... rt_sigprocmask resumed>NULL, 8) = 0
```

```
[pid 64495] madvise(0x7a48d6c00000, 8368128, MADV_DONTNEED) = 0
```

```
[pid 64495] exit(0) = ?
```

```
[pid 64483] <... futex resumed> = 0
```

```
[pid 64495] +++ exited with 0 +++
```

```
rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0
```

```
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d7400990, parent_tid=0x7a48d7400990,
exit_signal=0, stack=0x7a48d6c00000, stack_size=0x7fff80, tls=0x7a48d74006c0}strace: Process 64496
attached
```

```
=> {parent_tid=[64496]}, 88) = 64496
```

```
[pid 64496] rseq(0x7a48d7400fe0, 0x20, 0, 0x53053053 <unfinished ...>
```

```
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
```

```
[pid 64496] <... rseq resumed> = 0
```

```
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
```

```
[pid 64496] set_robust_list(0x7a48d74009a0, 24 <unfinished ...>
```

```
[pid 64483] rt_sigprocmask(SIG_BLOCK, ~[], <unfinished ...>
```

```
[pid 64496] <... set_robust_list resumed> = 0
```

```
[pid 64483] <... rt_sigprocmask resumed>[], 8) = 0
```

```
[pid 64496] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
```

```
[pid 64483]
```

```
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d6a00990, parent_tid=0x7a48d6a00990,
exit_signal=0, stack=0x7a48d6200000, stack_size=0x7fff80, tls=0x7a48d6a006c0} <unfinished ...>
```

```
[pid 64496] <... rt_sigprocmask resumed>NULL, 8) = 0
```

```
[pid 64496] rt_sigprocmask(SIG_BLOCK, ~[RT_1], strace: Process 64497 attached
NULL, 8) = 0
```

```
[pid 64483] <... clone3 resumed> => {parent_tid=[64497]}, 88) = 64497
```

```
[pid 64497] rseq(0x7a48d6a00fe0, 0x20, 0, 0x53053053 <unfinished ...>
```

```
[pid 64496] madvise(0x7a48d6c00000, 8368128, MADV_DONTNEED <unfinished ...>
```

```
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
```

```
[pid 64497] <... rseq resumed> = 0
```

```
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
```

```
[pid 64496] <... madvise resumed> = 0
```

```
[pid 64483] futex(0x7a48d7400990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64496, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
```

```
[pid 64497] set_robust_list(0x7a48d6a009a0, 24 <unfinished ...>
```

```
[pid 64496] exit(0 <unfinished ...>
```

```

[pid 64497] <... set_robust_list resumed>) = 0
[pid 64496] <... exit resumed>) = ?
[pid 64497] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64483] <... futex resumed>) = 0
[pid 64496] +++ exited with 0 +++
[pid 64497] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64483] futex(0x7a48d6a00990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64497, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64497] rt_sigprocmask(SIG_BLOCK, ~[RT_1], NULL, 8) = 0
[pid 64497] madvise(0x7a48d6200000, 8368128, MADV_DONTNEED) = 0
[pid 64497] exit(0) = ?
[pid 64497] +++ exited with 0 +++
<... futex resumed>) = 0
rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d6a00990, parent_tid=0x7a48d6a00990,
exit_signal=0, stack=0x7a48d6200000, stack_size=0x7fff80, tls=0x7a48d6a006c0})strace: Process 64498
attached
=> {parent_tid=[64498]}, 8) = 64498
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64498] rseq(0x7a48d6a00fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64498] <... rseq resumed>) = 0
[pid 64483] rt_sigprocmask(SIG_BLOCK, ~[], <unfinished ...>
[pid 64498] set_robust_list(0x7a48d6a009a0, 24 <unfinished ...>
[pid 64483] <... rt_sigprocmask resumed>[], 8) = 0
[pid 64498] <... set_robust_list resumed>) = 0
[pid 64483]
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d7400990, parent_tid=0x7a48d7400990,
exit_signal=0, stack=0x7a48d6c00000, stack_size=0x7fff80, tls=0x7a48d74006c0}) <unfinished ...>
[pid 64498] rt_sigprocmask(SIG_SETMASK, [], NULL, 8) = 0
strace: Process 64499 attached
[pid 64483] <... clone3 resumed> => {parent_tid=[64499]}, 8) = 64499
[pid 64499] rseq(0x7a48d7400fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64498] rt_sigprocmask(SIG_BLOCK, ~[RT_1], <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64499] <... rseq resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64498] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64499] set_robust_list(0x7a48d74009a0, 24 <unfinished ...>
[pid 64483] futex(0x7a48d6a00990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64498, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64498] madvise(0x7a48d6200000, 8368128, MADV_DONTNEED <unfinished ...>
[pid 64499] <... set_robust_list resumed>) = 0
[pid 64499] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64498] <... madvise resumed>) = 0
[pid 64499] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64498] exit(0) = ?
[pid 64499] rt_sigprocmask(SIG_BLOCK, ~[RT_1], <unfinished ...>
[pid 64483] <... futex resumed>) = 0
[pid 64499] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64498] +++ exited with 0 +++
[pid 64483] futex(0x7a48d7400990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64499, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64499] madvise(0x7a48d6c00000, 8368128, MADV_DONTNEED) = 0
[pid 64499] exit(0) = ?
[pid 64483] <... futex resumed>) = 0
[pid 64499] +++ exited with 0 +++
rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d7400990, parent_tid=0x7a48d7400990,
exit_signal=0, stack=0x7a48d6c00000, stack_size=0x7fff80, tls=0x7a48d74006c0})strace: Process 64500
attached

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=> {parent_tid=[64500]}, 88) = 64500
[pid 64500] rseq(0x7a48d7400fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64500] <... rseq resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64500] set_robust_list(0x7a48d74009a0, 24 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_BLOCK, ~[], <unfinished ...>
[pid 64500] <... set_robust_list resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>[], 8) = 0
[pid 64500] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64483]
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTID|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d6a00990, parent_tid=0x7a48d6a00990,
exit_signal=0, stack=0x7a48d6200000, stack_size=0x7fff80, tls=0x7a48d6a006c0} <unfinished ...>
[pid 64500] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64500] rt_sigprocmask(SIG_BLOCK, ~[RT_1], NULL, 8) = 0
strace: Process 64501 attached
[pid 64483] <... clone3 resumed> => {parent_tid=[64501]}, 88) = 64501
[pid 64500] madvise(0x7a48d6c00000, 8368128, MADV_DONTNEED <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64501] rseq(0x7a48d6a00fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64500] <... madvise resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64501] <... rseq resumed>) = 0
[pid 64500] exit(0 <unfinished ...>
[pid 64483] futex(0x7a48d7400990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64500, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64501] set_robust_list(0x7a48d6a009a0, 24 <unfinished ...>
[pid 64500] <... exit resumed>) = ?
[pid 64501] <... set_robust_list resumed>) = 0
[pid 64483] <... futex resumed>) = 0
[pid 64501] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64500] +++ exited with 0 +++
[pid 64483] futex(0x7a48d6a00990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64501, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64501] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64501] rt_sigprocmask(SIG_BLOCK, ~[RT_1], NULL, 8) = 0
[pid 64501] madvise(0x7a48d6200000, 8368128, MADV_DONTNEED) = 0
[pid 64501] exit(0) = ?
[pid 64501] +++ exited with 0 +++
<... futex resumed>) = 0
rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTID|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d6a00990, parent_tid=0x7a48d6a00990,
exit_signal=0, stack=0x7a48d6200000, stack_size=0x7fff80, tls=0x7a48d6a006c0})strace: Process 64502
attached
=> {parent_tid=[64502]}, 88) = 64502
[pid 64502] rseq(0x7a48d6a00fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64502] <... rseq resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64502] set_robust_list(0x7a48d6a009a0, 24 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_BLOCK, ~[], <unfinished ...>
[pid 64502] <... set_robust_list resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>[], 8) = 0
[pid 64502] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64483]
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTID|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d7400990, parent_tid=0x7a48d7400990,
exit_signal=0, stack=0x7a48d6c00000, stack_size=0x7fff80, tls=0x7a48d74006c0} <unfinished ...>
[pid 64502] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64502] rt_sigprocmask(SIG_BLOCK, ~[RT_1], strace: Process 64503 attached
<unfinished ...>
[pid 64483] <... clone3 resumed> => {parent_tid=[64503]}, 88) = 64503

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[pid 64502] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64503] rseq(0x7a48d7400fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64502] madvise(0x7a48d6200000, 8368128, MADV_DONTNEED <unfinished ...>
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64503] <... rseq resumed>          = 0
[pid 64502] <... madvise resumed>       = 0
[pid 64483] futex(0x7a48d6a00990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64502, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64503] set_robust_list(0x7a48d74009a0, 24 <unfinished ...>
[pid 64502] exit(0 <unfinished ...>
[pid 64503] <... set_robust_list resumed>) = 0
[pid 64502] <... exit resumed>          = ?
[pid 64503] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64502] +++ exited with 0 +++
[pid 64483] <... futex resumed>          = 0
[pid 64503] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64483] futex(0x7a48d7400990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64503, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64503] rt_sigprocmask(SIG_BLOCK, ~[RT_1], NULL, 8) = 0
[pid 64503] madvise(0x7a48d6c00000, 8368128, MADV_DONTNEED) = 0
[pid 64503] exit(0)                      = ?
[pid 64483] <... futex resumed>          = 0
[pid 64503] +++ exited with 0 +++
rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d7400990, parent_tid=0x7a48d7400990,
exit_signal=0, stack=0x7a48d6c00000, stack_size=0x7fff80, tls=0x7a48d74006c0}strace: Process 64504
attached
=> {parent_tid=[64504]}, 88) = 64504
[pid 64504] rseq(0x7a48d7400fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64504] <... rseq resumed>          = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64504] set_robust_list(0x7a48d74009a0, 24 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_BLOCK, ~[], <unfinished ...>
[pid 64504] <... set_robust_list resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>[], 8) = 0
[pid 64504] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64483]
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d6a00990, parent_tid=0x7a48d6a00990,
exit_signal=0, stack=0x7a48d6200000, stack_size=0x7fff80, tls=0x7a48d6a006c0} <unfinished ...>
[pid 64504] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64504] rt_sigprocmask(SIG_BLOCK, ~[RT_1], strace: Process 64505 attached
NULL, 8) = 0
[pid 64483] <... clone3 resumed> => {parent_tid=[64505]}, 88) = 64505
[pid 64505] rseq(0x7a48d6a00fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64504] madvise(0x7a48d6c00000, 8368128, MADV_DONTNEED <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64505] <... rseq resumed>          = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64504] <... madvise resumed>       = 0
[pid 64505] set_robust_list(0x7a48d6a009a0, 24 <unfinished ...>
[pid 64483] futex(0x7a48d7400990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64504, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64504] exit(0 <unfinished ...>
[pid 64505] <... set_robust_list resumed>) = 0
[pid 64504] <... exit resumed>          = ?
[pid 64505] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64483] <... futex resumed>          = 0
[pid 64504] +++ exited with 0 +++
[pid 64505] <... rt_sigprocmask resumed>NULL, 8) = 0

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[pid 64483] futex(0x7a48d6a00990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64505, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64505] rt_sigprocmask(SIG_BLOCK, ~[RT_1], NULL, 8) = 0
[pid 64505] madvise(0x7a48d6200000, 8368128, MADV_DONTNEED) = 0
[pid 64505] exit(0) = ?
[pid 64505] +++ exited with 0 +++
<... futex resumed>) = 0
rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d6a00990, parent_tid=0x7a48d6a00990,
exit_signal=0, stack=0x7a48d6200000, stack_size=0x7fff80, tls=0x7a48d6a006c0}strace: Process 64506
attached
=> {parent_tid=[64506]}, 88) = 64506
[pid 64506] rseq(0x7a48d6a00fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64506] <... rseq resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64506] set_robust_list(0x7a48d6a009a0, 24 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_BLOCK, ~[], <unfinished ...>
[pid 64506] <... set_robust_list resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>[], 8) = 0
[pid 64506] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64483]
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d7400990, parent_tid=0x7a48d7400990,
exit_signal=0, stack=0x7a48d6c00000, stack_size=0x7fff80, tls=0x7a48d74006c0} <unfinished ...>
[pid 64506] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64506] rt_sigprocmask(SIG_BLOCK, ~[RT_1], strace: Process 64507 attached
NULL, 8) = 0
[pid 64483] <... clone3 resumed>=> {parent_tid=[64507]}, 88) = 64507
[pid 64506] madvise(0x7a48d6200000, 8368128, MADV_DONTNEED <unfinished ...>
[pid 64507] rseq(0x7a48d7400fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64507] <... rseq resumed>) = 0
[pid 64506] <... madvise resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64506] exit(0 <unfinished ...>
[pid 64483] futex(0x7a48d6a00990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64506, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64506] <... exit resumed>) = ?
[pid 64507] set_robust_list(0x7a48d74009a0, 24 <unfinished ...>
[pid 64483] <... futex resumed>) = 0
[pid 64507] <... set_robust_list resumed>) = 0
[pid 64506] +++ exited with 0 +++
[pid 64483] futex(0x7a48d7400990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64507, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64507] rt_sigprocmask(SIG_SETMASK, [], NULL, 8) = 0
[pid 64507] rt_sigprocmask(SIG_BLOCK, ~[RT_1], NULL, 8) = 0
[pid 64507] madvise(0x7a48d6c00000, 8368128, MADV_DONTNEED) = 0
[pid 64507] exit(0) = ?
[pid 64483] <... futex resumed>) = 0
[pid 64507] +++ exited with 0 +++
rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d7400990, parent_tid=0x7a48d7400990,
exit_signal=0, stack=0x7a48d6c00000, stack_size=0x7fff80, tls=0x7a48d74006c0}strace: Process 64508
attached
=> {parent_tid=[64508]}, 88) = 64508
[pid 64508] rseq(0x7a48d7400fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64508] <... rseq resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64508] set_robust_list(0x7a48d74009a0, 24 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_BLOCK, ~[], <unfinished ...>

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[pid 64508] <... set_robust_list resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>[], 8) = 0
[pid 64508] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64483]
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d6a00990, parent_tid=0x7a48d6a00990,
exit_signal=0, stack=0x7a48d6200000, stack_size=0x7fff80, tls=0x7a48d6a006c0} <unfinished ...>
[pid 64508] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64508] rt_sigprocmask(SIG_BLOCK, ~[RT_1], strace: Process 64509 attached
<unfinished ...>
[pid 64483] <... clone3 resumed> => {parent_tid=[64509]}, 88) = 64509
[pid 64509] rseq(0x7a48d6a00fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64508] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64509] <... rseq resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64508] madvise(0x7a48d6c00000, 8368128, MADV_DONTNEED <unfinished ...>
[pid 64509] set_robust_list(0x7a48d6a009a0, 24 <unfinished ...>
[pid 64483] futex(0x7a48d7400990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64508, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64509] <... set_robust_list resumed>) = 0
[pid 64508] <... madvise resumed>) = 0
[pid 64509] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64508] exit(0 <unfinished ...>
[pid 64509] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64508] <... exit resumed>) = ?
[pid 64509] rt_sigprocmask(SIG_BLOCK, ~[RT_1], <unfinished ...>
[pid 64483] <... futex resumed>) = 0
[pid 64508] +++ exited with 0 +++
[pid 64509] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64483] futex(0x7a48d6a00990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64509, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64509] madvise(0x7a48d6200000, 8368128, MADV_DONTNEED) = 0
[pid 64509] exit(0) = ?
[pid 64483] <... futex resumed>) = 0
[pid 64509] +++ exited with 0 +++
rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d6a00990, parent_tid=0x7a48d6a00990,
exit_signal=0, stack=0x7a48d6200000, stack_size=0x7fff80, tls=0x7a48d6a006c0}strace: Process 64510
attached
=> {parent_tid=[64510]}, 88) = 64510
[pid 64510] rseq(0x7a48d6a00fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64510] <... rseq resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64510] set_robust_list(0x7a48d6a009a0, 24 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_BLOCK, ~[], <unfinished ...>
[pid 64510] <... set_robust_list resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>[], 8) = 0
[pid 64510] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64483]
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d7400990, parent_tid=0x7a48d7400990,
exit_signal=0, stack=0x7a48d6c00000, stack_size=0x7fff80, tls=0x7a48d74006c0} <unfinished ...>
[pid 64510] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64510] rt_sigprocmask(SIG_BLOCK, ~[RT_1], strace: Process 64511 attached
NULL, 8) = 0
[pid 64483] <... clone3 resumed> => {parent_tid=[64511]}, 88) = 64511
[pid 64511] rseq(0x7a48d7400fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64510] madvise(0x7a48d6200000, 8368128, MADV_DONTNEED <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64511] <... rseq resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0

```

```

[pid 64510] <... madvise resumed>          = 0
[pid 64511] set_robust_list(0x7a48d74009a0, 24 <unfinished ...>
[pid 64483] futex(0x7a48d6a00990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64510, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64511] <... set_robust_list resumed>) = 0
[pid 64510] exit(0 <unfinished ...>
[pid 64511] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64510] <... exit resumed>           = ?
[pid 64511] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64483] <... futex resumed>          = 0
[pid 64511] rt_sigprocmask(SIG_BLOCK, ~[RT_1], <unfinished ...>
[pid 64510] +++ exited with 0 +++
[pid 64483] futex(0x7a48d7400990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64511, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64511] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64511] madvise(0x7a48d6c00000, 8368128, MADV_DONTNEED) = 0
[pid 64511] exit(0)                       = ?
[pid 64483] <... futex resumed>          = 0
[pid 64511] +++ exited with 0 +++
rt_sigprocmask(SIG_BLOCK, ~[], [], 8)     = 0
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d7400990, parent_tid=0x7a48d7400990,
exit_signal=0, stack=0x7a48d6c00000, stack_size=0x7fff80, tls=0x7a48d74006c0}strace: Process 64512
attached
=> {parent_tid=[64512]}, 88) = 64512
[pid 64512] rseq(0x7a48d7400fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64512] <... rseq resumed>           = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64512] set_robust_list(0x7a48d74009a0, 24 <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_BLOCK, ~[], <unfinished ...>
[pid 64512] <... set_robust_list resumed>) = 0
[pid 64483] <... rt_sigprocmask resumed>[], 8) = 0
[pid 64512] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64483]
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSVSEM|CLONE_SETTLS|CLO
NE_PARENT_SETTID|CLONE_CHILD_CLEARTID, child_tid=0x7a48d6a00990, parent_tid=0x7a48d6a00990,
exit_signal=0, stack=0x7a48d6200000, stack_size=0x7fff80, tls=0x7a48d6a006c0} <unfinished ...>
[pid 64512] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64512] rt_sigprocmask(SIG_BLOCK, ~[RT_1], strace: Process 64513 attached
NULL, 8) = 0
[pid 64483] <... clone3 resumed> => {parent_tid=[64513]}, 88) = 64513
[pid 64513] rseq(0x7a48d6a00fe0, 0x20, 0, 0x53053053 <unfinished ...>
[pid 64512] madvise(0x7a48d6c00000, 8368128, MADV_DONTNEED <unfinished ...>
[pid 64483] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64513] <... rseq resumed>           = 0
[pid 64483] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64512] <... madvise resumed>        = 0
[pid 64513] set_robust_list(0x7a48d6a009a0, 24 <unfinished ...>
[pid 64483] futex(0x7a48d7400990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64512, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64513] <... set_robust_list resumed>) = 0
[pid 64512] exit(0 <unfinished ...>
[pid 64513] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
[pid 64512] <... exit resumed>           = ?
[pid 64513] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64512] +++ exited with 0 +++
[pid 64483] <... futex resumed>          = 0
[pid 64513] rt_sigprocmask(SIG_BLOCK, ~[RT_1], <unfinished ...>
[pid 64483] futex(0x7a48d6a00990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 64513, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 64513] <... rt_sigprocmask resumed>NULL, 8) = 0
[pid 64513] madvise(0x7a48d6200000, 8368128, MADV_DONTNEED) = 0
[pid 64513] exit(0)                       = ?

```

```

[pid 64483] <... futex resumed>                = 0
[pid 64513] +++ exited with 0 +++
write(1, "0 ", 20 )                            = 2
write(1, "1 ", 21 )                            = 2
write(1, "1 ", 21 )                            = 2
write(1, "3 ", 23 )                            = 2
write(1, "5 ", 25 )                            = 2
write(1, "7 ", 27 )                            = 2
write(1, "7 ", 27 )                            = 2
write(1, "8 ", 28 )                            = 2
write(1, "9 ", 29 )                            = 2
write(1, "9 ", 29 )                            = 2
write(1, "11 ", 311 )                          = 3
write(1, "12 ", 312 )                          = 3
write(1, "12 ", 312 )                          = 3
write(1, "14 ", 314 )                          = 3
write(1, "15 ", 315 )                          = 3
write(1, "15 ", 315 )                          = 3
write(1, "16 ", 316 )                          = 3
write(1, "17 ", 317 )                          = 3
write(1, "17 ", 317 )                          = 3
write(1, "19 ", 319 )                          = 3
write(1, "\n", 1                               = 1
)
write(1, "Time elapsed:0.014476 s\n", 24Time elapsed:0.014476 s
) = 24
exit_group(0)                                  = ?
+++ exited with 0 +++

```

Вывод

Задание мне показалось интересным, так как многопоточное программирование - одна из самых частых и важных тем. Я столкнулся с многими проблемами, самой сложной задачей, мне показалось распараллеливание исходного алгоритма

Число потоков	Время исполнения (с)	Ускорение	Эффективность
1	1.006487	1	1
2	0.582498	1.72	0.86
4	0.332793	3.02	0.98
8	0.267251	3.76	0.47
16	0.225936	4.45	0.27

