**Системное программное обеспечение**

**Лабораторная работа №4**

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P3217

#include "stdafx.h"

#include <Windows.h>

#include <iostream>

using namespace std;

time\_t filetimeToTime\_t(FILETIME filetime)

{

return ((time\_t)filetime.dwHighDateTime << 32) + filetime.dwLowDateTime;

}

time\_t processTime(HANDLE hProcess)

{

FILETIME creationTime, exitTime, kernelTime, userTime;

ZeroMemory(&creationTime, sizeof(creationTime));

ZeroMemory(&exitTime, sizeof(exitTime));

GetProcessTimes(hProcess, &creationTime, &exitTime, &kernelTime, &userTime);

time\_t startTime = filetimeToTime\_t(creationTime);

time\_t endTime = filetimeToTime\_t(exitTime);

return (endTime - startTime) / 10;

}

int wmain(int argc, wchar\_t\* argv[])

{

if (argc != 3 || (wstring)argv[1] != L"asc" && (wstring)argv[1] != L"desc")

{

cout << "Usage: " << endl << "spo4 {asc|desc} x" << endl;

system("pause");

return EXIT\_FAILURE;

}

STARTUPINFO startupInfo[3];

PROCESS\_INFORMATION processInfo[3];

HANDLE hProcess[3];

wstring args = L"copy.exe " + (wstring)argv[1] + L" " + (wstring)argv[2];

for (int i = 0; i < 3; i++)

{

ZeroMemory( &startupInfo[i], sizeof(startupInfo[i]) );

startupInfo[i].cb = sizeof(startupInfo[i]);

ZeroMemory( &processInfo[i], sizeof(processInfo[i]) );

bool success = CreateProcessW(L".\\sort.exe", (LPWSTR) args.c\_str(),

NULL, NULL, FALSE, CREATE\_NEW\_CONSOLE, NULL, NULL,

&startupInfo[i], &processInfo[i]);

if (!success)

{

cout << "CreateProcess failed: " << GetLastError() << endl;

system("pause");

return EXIT\_FAILURE;

}

hProcess[i] = processInfo[i].hProcess;

}

WaitForMultipleObjects(3, hProcess, TRUE, INFINITE);

DWORD handleCount;

GetProcessHandleCount(GetCurrentProcess(), &handleCount);

cout << "+-------+----------------+" << endl <<

"| PID | TIME |" << endl <<

"+-------+----------------+" << endl;

for (int i = 0; i < 3; i++)

{

time\_t time = processTime(hProcess[i]);

printf("|%7u|%12lli mcs|\n", GetProcessId(hProcess[i]), time);

CloseHandle(hProcess[i]);

}

cout << "+-------+----------------+" << endl << endl;

cout << "Handles count: " << handleCount << endl << endl;

system("pause");

}