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**Звіт**  
до лабораторної роботи № 2  
з дисципліни  
Операційні системи  
на тему:  
“Робота з процесами в ОС Windows”

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**Ратушняк Денис**

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**Мета роботи:** Ознайомитися з процесами в ОС Windows. Навчитися працювати з процесами, використовуючи WinAPI-функції.

**Завдання:**

22. [Складність 3,5] Заархівувати обрану папку (реалізувати навігацію по файловій системі) за допомогою утиліти 7-zip (або аналогів).

**Код програми:**

```
#include <bits/stdc++.h>
#include <windows.h>
#include <windowsx.h>
#include "commdlg.h"
#include <conio.h>
#include <tlhelp32.h>
#include <tchar.h>
#include <stdio.h>
using namespace std;

void suspend(DWORD processId)
{
    HANDLE hThreadSnapshot =
CreateToolhelp32Snapshot(TH32CS_SNAPTHREAD, 0);

    THREADENTRY32 threadEntry;
    threadEntry.dwSize = sizeof(THREADENTRY32);

    Thread32First(hThreadSnapshot, &threadEntry);

    do
    {
        if (threadEntry.th32OwnerProcessID == processId)
        {
            HANDLE hThread = OpenThread(THREAD_ALL_ACCESS,
FALSE,
                threadEntry.th32ThreadID);

            SuspendThread(hThread);
            CloseHandle(hThread);
        }
    } while (Thread32Next(hThreadSnapshot, &threadEntry));

    CloseHandle(hThreadSnapshot);
}
```

```

void resume(DWORD processId){
    HANDLE hThreadSnapshot =
CreateToolhelp32Snapshot(TH32CS_SNAPTHREAD, 0);

    THREADENTRY32 threadEntry;
    threadEntry.dwSize = sizeof(THREADENTRY32);

    Thread32First(hThreadSnapshot, &threadEntry);

    do
    {
        if (threadEntry.th32OwnerProcessID == processId)
        {
            HANDLE hThread = OpenThread(THREAD_ALL_ACCESS,
FALSE,
            threadEntry.th32ThreadID);

            ResumeThread(hThread);
            CloseHandle(hThread);
        }
    } while (Thread32Next(hThreadSnapshot, &threadEntry));

    CloseHandle(hThreadSnapshot);
}

int main()
{
    ios_base::sync_with_stdio(0);
    SetConsoleOutputCP(1251);

    PROCESS_INFORMATION pi ;
    STARTUPINFO si ;
    ZeroMemory(&si, sizeof(si)) ;
    si.cb = sizeof( si ) ;
    printf( "Press any key to start programm\n" );
    getch();

    OPENFILENAME file;
    char file_name[256];
    ZeroMemory(&file, sizeof(OPENFILENAME));
    file.lStructSize = sizeof(OPENFILENAME);
    file.lpstrFile = file_name;
    file.nMaxFile = 256;
    GetOpenFileName(&file);
}

```

```

string path = file.lpstrFile;

for(int i = path.size()-1; i >= 0 && path[i]!='\\'; i--){
    path.pop_back();
}
path.pop_back();
cout << path << "\n";

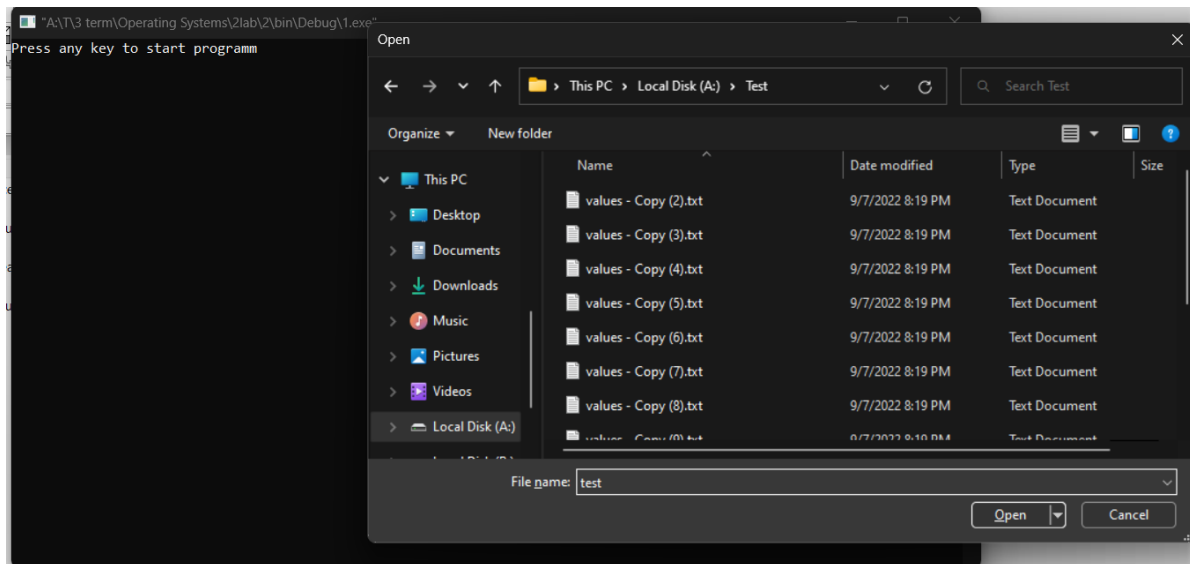
string command;
command += "";
command += "c:\\program files\\winrar\\rar.exe";
command += "";
command += " a -r A:\\RAR.rar ";
command += path;
//cout << command << "\n";
CreateProcess( NULL , &command[0], NULL, NULL, FALSE, 0,
NULL, NULL, &si, &pi );

DWORD archive_id = pi.dwProcessId;
HANDLE archive_handle= pi.hProcess;
cout << "ID " << archive_id << "\n";
int a,b;
a = GetPriorityClass(archive_handle); cout << "PriorityClass = " << a
<< "\n";
SetPriorityClass(archive_handle,
BELOW_NORMAL_PRIORITY_CLASS);

suspend(archive_id);
cout << "Now thread is paused, input 0 to kill it, the other number will
resume it\n";
cin >> b;
a = GetPriorityClass(archive_handle); cout << "PriorityClass = " << a <<
"\n";
SetPriorityClass(archive_handle, HIGH_PRIORITY_CLASS);
a = GetPriorityClass(archive_handle); cout << "PriorityClass = " << a
<< "\n";

if(b) resume(archive_id);
else {
    TerminateProcess(archive_handle, 0);
    return 0;
}
return 0;
}

```



```
"A:\T\3 term\Operating Systems\2lab\2\bin\Debug\1.exe"
Press any key to start programm

RAR 6.11 x64   Copyright (c) 1993-2022 Alexander Roshal   3 Mar 2022
Trial version           Type 'rar -?' for help

Evaluation copy. Please register.

Updating archive A:\RAR.rar

Updating A:\Test\values - Copy (10).txt      OK
Updating A:\Test\values - Copy (11).txt      OK
Updating A:\Test\values - Copy (12).txt      OK
Updating A:\Test\values - Copy (13).txt      OK
Updating A:\Test\values - Copy (14).txt      OK
Updating A:\Test\values - Copy (2).txt       OK
Updating A:\Test\values - Copy (3).txt       OK
Updating A:\Test\values - Copy (4).txt       20%A:\Test
ID 22804
PriorityClass = 32
Now thread is paused, input 0 to kill it, the other number will resume it
0

Process returned 0 (0x0)   execution time : 51.600 s
Press any key to continue.
```

```
"A:\T\3 term\Operating Systems\2lab\2\bin\Debug\1.exe"
ID 17604
PriorityClass = 32
Now thread is paused, input 0 to kill it, the other number will resume it
1
Adding A:\Test\values - Copy (10) - Copy.txt 27%PriorityClass = 16384
PriorityClass = 128
OK
Adding A:\Test\values - Copy (11) - Copy.txt OK
Adding A:\Test\values - Copy (12) - Copy.txt OK
Adding A:\Test\values - Copy (13) - Copy.txt OK
Adding A:\Test\values - Copy (14) - Copy.txt OK
Adding A:\Test\values - Copy (15) - Copy.txt OK
Adding A:\Test\values - Copy (16) - Copy.txt OK
Adding A:\Test\values - Copy (17) - Copy.txt OK
Adding A:\Test\values - Copy (18) - Copy.txt OK
Adding A:\Test\values - Copy (19) - Copy.txt OK
Adding A:\Test\values - Copy (2) - Copy.txt 46%
Process returned 0 (0x0) execution time : 16. OK
Press any key to continue.

Adding A:\Test\values - Copy (20) - Copy.txt OK
Adding A:\Test\values - Copy (21) - Copy.txt OK
Adding A:\Test\values - Copy (22) - Copy.txt OK
Adding A:\Test\values - Copy (23) - Copy.txt OK
Adding A:\Test\values - Copy (24) - Copy.txt OK
Adding A:\Test\values - Copy (25) - Copy.txt OK
Adding A:\Test\values - Copy (26) - Copy.txt OK
Adding A:\Test\values - Copy (3) - Copy.txt OK
Adding A:\Test\values - Copy (4) - Copy.txt OK
Adding A:\Test\values - Copy (5) - Copy.txt OK
Adding A:\Test\values - Copy (6) - Copy.txt OK
Adding A:\Test\values - Copy (7) - Copy.txt OK
Adding A:\Test\values - Copy (8) - Copy.txt OK
Adding A:\Test\values - Copy (9) - Copy.txt OK
Adding A:\Test\_rar_22804.25668 OK
Done
```

RAR.rar (evaluation copy)

File Commands Tools Favorites Options Help

Add Extract To Test View Delete Find Wizard Info VirusScan Comment Prote

↑ RAR.rar\Test - RAR archive, unpacked size 2,608 bytes

Name	Size	Packed	Type	Modified	CRC32
..			File folder		
_rar_22804.25668	736	232	25668 File	9/8/2022 12:11 ...	4AA64354
values - Copy (2)...	48	42	Text Document	9/7/2022 8:19 P...	AE725636
values - Copy (2)...	48	42	Text Document	9/7/2022 8:19 P...	AE725636
values - Copy (3)...	48	42	Text Document	9/7/2022 8:19 P...	AE725636
values - Copy (3)...	48	42	Text Document	9/7/2022 8:19 P...	AE725636
values - Copy (4)...	48	42	Text Document	9/7/2022 8:19 P...	AE725636
values - Copy (4)...	48	42	Text Document	9/7/2022 8:19 P...	AE725636
values - Copy (5)...	48	42	Text Document	9/7/2022 8:19 P...	AE725636
values - Copy (5)...	48	42	Text Document	9/7/2022 8:19 P...	AE725636
values - Copy (6)...	48	42	Text Document	9/7/2022 8:19 P...	AE725636
values - Copy (6)...	48	42	Text Document	9/7/2022 8:19 P...	AE725636
values - Copy (7)...	48	42	Text Document	9/7/2022 8:19 P...	AE725636
values - Copy (7)...	48	42	Text Document	9/7/2022 8:19 P...	AE725636
values - Copy (8)...	48	42	Text Document	9/7/2022 8:19 P...	AE725636
values - Copy (8)...	48	42	Text Document	9/7/2022 8:19 P...	AE725636
values - Copy (9)...	48	42	Text Document	9/7/2022 8:19 P...	AE725636
values - Copy (9)...	48	42	Text Document	9/7/2022 8:19 P...	AE725636
values - Copy (1...	48	42	Text Document	9/7/2022 8:19 P...	AE725636

The screenshot displays the Windows Task Manager application, specifically the 'Details' tab. The interface is dark-themed. On the left, a vertical sidebar contains icons for Task Manager, Performance, History, Startup, Power, and Settings. The main area shows a list of running processes with columns for Name, Base priority, PID, Status, User name, and Session ID. The process 'Rar.exe' is highlighted with a white background. Other visible processes include chrome.exe, opera.exe, Teams.exe, svchost.exe, and ArmouryCrate.Service...

Name	Base priority	PID	Status	User name	Session
chrome.exe	Above normal	19896	Running	denis	1
opera.exe	Low	16664	Running	denis	1
chrome.exe	Low	21856	Running	denis	1
opera.exe	Low	16860	Running	denis	1
chrome.exe	Low	7120	Running	denis	1
opera.exe	Low	15896	Running	denis	1
Teams.exe	Normal	14968	Running	denis	1
opera.exe	Low	14624	Running	denis	1
svchost.exe	Normal	5932	Running	CICTE...	0
opera.exe	Low	17288	Running	denis	1
Rar.exe	Below normal	18224	Suspen...	denis	1
svchost.exe	Normal	5904	Running	LOCAL ...	0
Teams.exe	Normal	3864	Running	denis	1
chrome.exe	Low	1988	Running	denis	1
ArmouryCrate.Service...	Normal	5536	Running	CICTE...	0
opera.exe	Normal	17576	Running	denis	1
opera.exe	Low	14708	Running	denis	1
opera.exe	Normal	16156	Running	denis	1

28		opera.exe	Low	10416	Running	denis	1	00	0:00:00	112,012 K	13
29		opera.exe	Low	23352	Running	denis	1	00	0:00:00	113,972 K	14
30		opera.exe	Low	14624	Running	denis	1	00	0:00:00	140,548 K	17
31		opera.exe	Low	10708	Running	denis	1	00	0:00:00	121,672 K	12
32		opera.exe	Low	13544	Running	denis	1	00	0:00:00	33,604 K	3
33		opera_crashreporter....	Normal	15976	Running	denis	1	00	0:00:00	8,984 K	
34	voice	ovpnhelper_service.exe	Normal	6408	Running	СИСТЕ...	0	00	0:00:00	5,984 K	
35		PhoneExperienceHos...	Normal	14860	Running	denis	1	00	0:00:00	122,052 K	16
36		PresentationFontCach...	Normal	4572	Running	LOCAL ...	0	00	0:00:00	17,816 K	2
37		Rar.exe	High	14628	Running	denis	1	02	0:00:21	488,740 K	48
38		Registry	N/A	208	Running	СИСТЕ...	0	00	0:00:00	57,680 K	11
39		ROGLiveService.exe	Normal	6428	Running	СИСТЕ...	0	00	0:00:00	17,264 K	2
40		RstMyService.exe	Normal	6596	Running	СИСТЕ...	0	00	0:00:00	7,840 K	

**Висновок:** Я закріпив вміння та навички роботи з процесами та потоками в ОС Windows. Навчився працювати із процесами, використовуючи WinAPI-функції. Створив програму, яка архівує файли з вибраної папки, з можливістю обірвати процес архівування.