

**МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
НАЦІОНАЛЬНОМУ УНІВЕРСИТЕТІ “ЛЬВІВСЬКА
ПОЛІТЕХНІКА”**

Кафедра систем штучного інтелекту

Лабораторна робота №3

з дисципліни

«Операційні системи»

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Тема. Виконання задачі в декількох потоках в ОС Windows

Мета. Навчитись реалізовувати розпаралелювання алгоритмів за допомогою багатопоточності в ОС Windows з використанням функцій WinAPI.

Завдання.

1. Реалізувати заданий алгоритм в окремому потоці.
2. Виконати розпаралелювання заданого алгоритму на 2, 4, 8 потоків.
3. Реалізувати можливість зміни пріоритету певного потоку.
4. Результати виконання роботи відобразити у звіті.

Варіант 19:

19. Реалізувати пошук файлів за заданим розміром. Назви файлів повинні бути відсортовані в алфавітному порядку.

Код:

```
#include <Windows.h>

#include <thread>

#include <iostream>

#include <set>

#include <string>

#include <algorithm>

#include <iomanip>

#include <conio.h>

#include <stdio.h>

#include <locale>

#include <vector>

#include <tchar.h>

using namespace std;

WIN32_FIND_DATA FindFileData, FindFileData1;

DWORD nFileSizeLow;
```

```

HANDLE hf, hf1;
FILETIME et, kt, ut;
SYSTEMTIME cm;
vector <string> files;
vector <long int> files_size;
vector <string> res;
int size0, per_process;
struct PARAMETERS
{ int from, to; };

void find_(int from) {
    cout << "Thread with ID " << this_thread::get_id() << " has started" << endl;
    int to = from + per_process - 1;
    for (int i = from; i <= to; i++) {
        bool is_file = false;
        for (int j = 0; j < files[i].length(); j++) {
            if (files[i][j] == '.') { is_file = true; }
        }
        if (files_size[i] == size0) {
            cout << files[i] << endl;
        }
        //Sleep(500);
    }
    cout << "Process with ID " << this_thread::get_id() << " has ended!" << endl;
    Sleep(500000);
}

```

```

int main(int argv, char* argc[]) {
    SetConsoleCP(1251);
    SetConsoleOutputCP(1251);
    DWORD ID = 0;
    int cnt = 0, from, to;
    pair <int, int> p;
    static PARAMETERS par;
    hf = FindFirstFile("C:\\files\\*", &FindFileData);
    if (hf != INVALID_HANDLE_VALUE) {
        do {
            bool is_true = true;
            files.push_back(FindFileData.cFileName);
            files_size.push_back(FindFileData.nFileSizeLow);
            for (int j = 0; j < files[cnt].length(); j++) {
                if (files[cnt][j] == '.') { is_true = false; break; }
            }
            cnt++;
            if (is_true) {
                string s = "C:\\\" + files[cnt - 1] + "\\*";
                const char* path = s.c_str();
                hf1 = FindFirstFile(path, &FindFileData1);
                if (hf1 != INVALID_HANDLE_VALUE) {
                    do {
                        files.push_back(FindFileData1.cFileName);
                        files_size.push_back(FindFileData1.nFileSizeLow);
                        cnt++;
                    } while (FindNextFile(hf1, &FindFileData1) != 0);
                }
            }
        } while (FindNextFile(hf, &FindFileData) != 0);
    }
}

```

```

        FindClose(hf1);
    }
}
} while (FindNextFile(hf, &FindFileData) != 0);
FindClose(hf);
}

cout << "Number of files: " << endl << cnt << endl;
cout << "Enter size of file: " << endl;
cin >> size0;
cout << "Enter count of processes: " << endl;
int n;
cin >> n;
cout << endl;
per_process = cnt / n;
HANDLE* hThreads = new HANDLE[n];
for (int i = 0; i < n; i++) {
    from = (i * per_process);
    //cout << from << " ";
    p = make_pair(from, to);

    hThreads[i] = CreateThread(NULL, 0, (LPTHREAD_START_ROUTINE)find_,
(LPVOID)from, 0, &ID);
}

int choice;
_getch();
do {

```

```

    cout << "Would you like to set the priority to one of the thread? " << endl
    << "1. Yes" << endl << "2. Exit" << endl;

    cin >> choice;

    if (choice == 1) {
        int thread;

        cout << "Input the number of thread: ";

        cin >> thread;

        cout << "1. Highest priority " << endl;
        cout << "2. Above normal priority " << endl;
        cout << "3. Normal priority " << endl;
        cout << "4. Below normal priority " << endl;
        cout << "5. Idle priority " << endl;

        int ch; cin >> ch;

        switch (ch) {
            case 1: {SetThreadPriority(hThreads[thread - 1],
THREAD_PRIORITY_HIGHEST); }

            case 2: {SetThreadPriority(hThreads[thread - 1],
THREAD_PRIORITY_ABOVE_NORMAL); }

            case 3: {SetThreadPriority(hThreads[thread - 1],
THREAD_PRIORITY_NORMAL); }

            case 4: {SetThreadPriority(hThreads[thread - 1],
THREAD_PRIORITY_BELOW_NORMAL); }

            case 5: {SetThreadPriority(hThreads[thread - 1],
THREAD_PRIORITY_IDLE); }

        }

    }

} while (choice == 1);

cout << "All threads ended!" << endl << endl;

```

```
//for (int i = 0; i < n; i++) cout << "Thread " << this_thread::get_id()<< "
priority: " << GetThreadPriority(hThreads[i]) << endl;
```

```
for (int i = 0; i < n; i++) {
    CloseHandle(hThreads[i]);
}
return 0;
}
```

```
C:\Users\soles\source\repos\OS3\Debug\OS3.exe
Number of files:
12720
Enter size of file:
281
Enter count of processes:
2

Thread with ID 17020 has started
Thread with ID 18684 has started
FileSystemMetadata - ????? (10) - ????? - ?????.xml
FileSystemMetadata - ????? (10) - ?????.xml
FileSystemMetadata - ????? (11) - ????? - ?????.xml
FileSystemMetadata - ????? (11) - ?????.xml
FileSystemMetadata - ????? (2) - ????? - ????? - ????? - ?????.xml
FileSystemMetadata - ????? (2) - ????? - ????? - ?????.xml
FileSystemMetadata - ????? (2) - ????? - ?????.xml
FileSystemMetadata - ????? (2) - ?????.xml
FileSystemMetadata - ????? (2).xml
FileSystemMetadata - ????? (3) - ????? - ????? - ?????.xml
FileSystemMetadata - ????? (3) - ????? - ?????.xml
FileSystemMetadata - ????? (3) - ?????.xml
FileSystemMetadata - ????? (3).xml
FileSystemMetadata - ????? (4) - ????? - ????? - ?????.xml
FileSystemMetadata - ????? (4) - ????? - ?????.xml
FileSystemMetadata - ????? (4) - ?????.xml
FileSystemMetadata - ????? (4).xml
FileSystemMetadata - ????? (5) - ????? - ????? - ?????.xml
FileSystemMetadata - ????? (5) - ????? - ?????.xml
FileSystemMetadata - ????? (5) - ?????.xml
FileSystemMetadata - ????? (5).xml
FileSystemMetadata - ????? (6) - ????? - ????? - ?????.xml
FileSystemMetadata - ????? (6) - ????? - ?????.xml
FileSystemMetadata - ????? (6) - ?????.xml
FileSystemMetadata - ????? (6).xml
FileSystemMetadata - ????? (7) - ????? - ?????.xml
FileSystemMetadata - ????? (7) - ?????.xml
FileSystemMetadata - ????? (8) - ????? - ?????.xml
FileSystemMetadata - ????? (8) - ?????.xml
FileSystemMetadata - ????? (9) - ????? - ?????.xml
FileSystemMetadata - ????? (9) - ?????.xml
FileSystemMetadata - ????? (2) - ????? - ????? - ?????.xml
```

OS3.exe:8000 Properties

Count: 3

TID	CPU	Cycles Delta	Suspend Count	Start Address
2500				OS3.exe@ILT+31...
18684				OS3.exe@ILT+10...
17020				OS3.exe@ILT+10...

Thread ID: 2500 Stack Module

Start: 13:00:06 29.10.2020

State: Wait:Executive Base Priority: 8

Kernel: 0:00:00.031 Dynamic Priority: 8

User Time: 0:00:00.296 I/O Priority: Normal

Context Switches: 218 Memory Priority: 5

Cycles: 777 995 466 Ideal Processor: 2

Permissions Kill Suspend

OK Cancel

Time	Threads	Private Delta...	Virtual Size	Peak Private Bytes	USER Objects	PF Delta	Session
809	76	2 152 438 ...	72 536 K	459	3		
100	5	2 151 746 ...	1 680 K	0			
296	5	2 151 843 ...	9 540 K	0			
078	3	48 972 K	2 064 K	0			
031	3	4 282 540 K	1 864 K	0			
062	2	2 151 757 ...	2 172 K	0			
734	7	2 151 831 ...	5 284 K	18			
875	8	4 859 728 K	29 796 K	0			
015	3	2 151 753 ...	1 728 K	0			
046	3	2 151 747 ...	1 532 K	0			
734	0	0 K	0 K	0			
140	2	4 258 728 K	2 708 K	0			
390	4	86 568 K	5 156 K	0			
296	12	2 152 120 ...	35 024 K	20			
500	9	2 151 805 ...	9 764 K	0			
593	8	4 291 428 K	3 736 K	0			
437	18	4 337 264 K	9 084 K	0			
734	23	4 390 320 K	38 296 K	0			
171	2	4 298 492 K	3 992 K	0			
484	23	4 436 168 K	15 344 K	45			
375	58	720 000 K	1 692 K	0	1		
125	47	4 400 024 K	18 076 K	0			
593	26	4 307 104 K	4 936 K	0			
000	7	4 285 908 K	6 880 K	0			
871	7	4 839 036 K	38 776 K	2			
859	86	4 501 356 K	31 020 K	0			
140	57	40 K 38 292 204 ...	44 672 K	0	10		
703	24	4 381 508 K	14 708 K	8			
156	9	2 151 761 ...	4 184 K	0			
421	39	2 152 391 ...	358 112 K	0	33		
062	7	4 334 272 K	13 008 K	2			
375	10	-1 616 K 2 151 782 ...	14 200 K	0	6		
093	19	2 151 866 ...	16 188 K	0			
578	5	4 810 884 K	30 356 K	0			
718	19	287 300 K	65 600 K	59			
OS3.exe		4 330 K 8000 62 0.00.00.468	28 163 000	22 213 K	0		

CPU Usage: 25.56%

C:\Users\soles\source\repos\OS3\Debug\OS3.exe

```
Number of files:
12720
Enter size of file:
281
Enter count of processes:
4

Thread with ID 3044 has started
Thread with ID 16288 has startedThread with ID 6936 has started
Thread with ID 10168 has started

FileSystemMetadata - ????? (10) - ????? - ?????.xml
FileSystemMetadata - ????? (10) - ?????.xml
FileSystemMetadata - ????? (11) - ????? - ?????.xml
FileSystemMetadata - ????? (11) - ?????.xml
FileSystemMetadata - ????? (2) - ????? - ????? - ????? - ?????.xml
FileSystemMetadata - ????? (2) - ????? - ????? - ?????.xml
FileSystemMetadata - ????? (2) - ????? - ?????.xml
FileSystemMetadata - ????? (2) - ?????.xml
FileSystemMetadata - ????? (2).xml
FileSystemMetadata - ????? (3) - ????? - ????? - ?????.xml
FileSystemMetadata - ????? (3) - ????? - ?????.xml
FileSystemMetadata - ????? (3) - ?????.xml
FileSystemMetadata - ????? (3).xml
FileSystemMetadata - ????? (4) - ????? - ????? - ?????.xml
FileSystemMetadata - ????? (4) - ????? - ?????.xml
FileSystemMetadata - ????? (4) - ?????.xml
FileSystemMetadata - ????? (4).xml
FileSystemMetadata - ????? (5) - ????? - ????? - ?????.xml
FileSystemMetadata - ????? (5) - ????? - ?????.xml
FileSystemMetadata - ????? (5) - ?????.xml
FileSystemMetadata - ????? (5).xml
FileSystemMetadata - ????? (6) - ????? - ????? - ?????.xml
FileSystemMetadata - ????? (6) - ????? - ?????.xml
FileSystemMetadata - ????? (6) - ?????.xml
FileSystemMetadata - ????? (6).xml
FileSystemMetadata - ????? (7) - ????? - ?????.xml
FileSystemMetadata - ????? (7) - ?????.xml
FileSystemMetadata - ????? (8) - ????? - ?????.xml
FileSystemMetadata - ????? (8) - ?????.xml
FileSystemMetadata - ????? (9) - ????? - ?????.xml
```

C:\Users\soles\source\repos\OS3\Debug\OS3.exe

```
FileSystemMetadata - ????? (8) - ?????.xml
FileSystemMetadata - ????? (9) - ????? - ?????.xml
FileSystemMetadata - ????? (9) - ?????.xml
FileSystemMetadata - ????? - ????? (2) - ????? - ????? - ?????.xml
FileSystemMetadata - ????? - ????? (2) - ????? - ?????.xml
FileSystemMetadata - ????? - ????? (2) - ?????.xml
FileSystemMetadata - ????? - ????? (2).xml
FileSystemMetadata - ????? - ????? (3) - ????? - ?????.xml
FileSystemMetadata - ????? - ????? (3) - ?????.xml
FileSystemMetadata - ????? - ????? (3).xml
FileSystemMetadata - ????? - ????? (4) - ????? - ?????.xml
FileSystemMetadata - ????? - ????? (4) - ?????.xml
FileSystemMetadata - ????? - ????? (4).xml
FileSystemMetadata - ????? - ????? (5) - ????? - ?????.xml
FileSystemMetadata - ????? - ????? (5) - ?????.xml
FileSystemMetadata - ????? - ????? (5).xml
FileSystemMetadata - ????? - ????? (6) - ?????.xml
FileSystemMetadata - ????? - ????? (7) - ?????.xml
FileSystemMetadata - ????? - ????? - ????? (2) - ????? - ?????.xml
FileSystemMetadata - ????? - ????? - ????? (2) - ?????.xml
FileSystemMetadata - ????? - ????? - ????? (2).xml
FileSystemMetadata - ????? - ????? - ????? (3) - ?????.xml
Process with ID 3044 has ended!
FileSystemMetadata - ????? - ????? - ????? (3).xml
Process with ID 6936 has ended!
FileSystemMetadata - ????? - ????? - ????? (4) - ?????.xml
Process with ID 16288 has ended!
FileSystemMetadata - ????? - ????? - ????? (4).xml
FileSystemMetadata - ????? - ????? - ????? (2) - ?????.xml
FileSystemMetadata - ????? - ????? - ????? (2).xml
FileSystemMetadata - ????? - ????? - ????? (3).xml
FileSystemMetadata - ????? - ????? - ????? - ????? (2).xml
FileSystemMetadata - ????? - ????? - ????? - ????? - ?????.xml
FileSystemMetadata - ????? - ????? - ????? - ????? - ?????.xml
FileSystemMetadata - ????? - ????? - ?????.xml
FileSystemMetadata - ????? - ????? - ?????.xml
FileSystemMetadata - ?????.xml
Process with ID 10168 has ended!
```

Process Explorer - Sysinternals: www.sysinternals.com [DESKTOP-U5CRL1R\soles]

File Options View Process Find Users Help

OS3.exe:1980 Properties

TCP/IP Security Environment Job Strings

Image Performance Performance Graph GPU Graph Threads

Count: 5

TID	CPU	Cycles Delta	Suspend Count	Start Address
5284				OS3.exe@ILT+31...
10168				OS3.exe@ILT+10...
6936				OS3.exe@ILT+10...
3044				OS3.exe@ILT+10...
16288				OS3.exe@ILT+10...

me	Threads	Private Delta...	Virtual Size	Peak Private Bytes	USER Objects	PF Delta	Session
000	5	2 151 746 ...	1 680 K	0			
296	5	2 151 843 ...	9 540 K	0			
078	3	48 972 K	2 064 K	0			
031	3	4 282 540 K	1 864 K	0			
062	2	2 151 757 ...	2 172 K	0			
734	7	2 151 831 ...	5 284 K	18			
875	8	4 859 728 K	29 796 K	0			
015	3	2 151 753 948 K	1 728 K	0			
046	3	2 151 747 ...	1 532 K	0			
218	0	0 K	0 K	0			
140	2	4 258 728 K	2 708 K	0			
300	4	86 568 K	5 156 K	0			
286	12	2 152 120 ...	35 024 K	20			
703	9	2 151 805 ...	9 764 K	0			
840	8	4 291 428 K	3 736 K	0			
437	18	4 337 264 K	9 084 K	0			
750	25	4 392 368 K	38 296 K	0			
171	2	4 298 492 K	3 992 K	0			
500	24	4 437 192 K	15 344 K	45			
484	58	799 488 K	1 760 K	0			
171	47	4 400 024 K	18 076 K	0			
856	26	4 307 104 K	4 936 K	0			
000	7	4 285 908 K	6 880 K	0			
703	7	4 839 036 K	38 776 K	2			
250	89	4 504 428 K	31 020 K	0			
234	58	48 K 38 293 228...	44 672 K	0	12		
703	24	4 381 508 K	14 708 K	8			
156	9	2 151 761 ...	4 184 K	0			
906	39	2 152 407 ...	367 424 K	0			
062	7	4 338 368 K	13 028 K	2			
562	10	2 151 782 ...	14 200 K	0			
093	20	2 151 867 ...	16 188 K	0			
578	5	4 810 864 K	30 356 K	0			
718	20	288 580 K	65 600 K	59			
734	5	51 380 K	4 836 K	1			

CPU Usage: 22.93%

C:\Users\soles\source\repos\OS3\Debug\OS3.exe

```
Number of files:
12720
Enter size of file:
93
Enter count of processes:
8

Thread with ID 9864 has started
Thread with ID Thread with ID 13340 has started
Thread with ID 6192 has started
Thread with ID 11288 has started
Thread with ID 2580 has started
Thread with ID 2168 has startedThread with ID 8048 has started
```

```
13888 has started
rolloutfile - ????? (10) - ????? - ????? - ?????.tv13
rolloutfile - ????? (10) - ????? - ?????.tv13
rolloutfile - ????? (10) - ?????.tv13
rolloutfile - ????? (11) - ????? - ????? - ?????.tv13
rolloutfile - ????? (11) - ????? - ?????.tv13
rolloutfile - ????? (11) - ?????.tv13
rolloutfile - ????? (12) - ????? - ????? - ?????.tv13
rolloutfile - ????? (12) - ????? - ?????.tv13
rolloutfile - ????? (12) - ?????.tv13
rolloutfile - ????? (13) - ????? - ????? - ?????.tv13
rolloutfile - ????? (13) - ????? - ?????.tv13
rolloutfile - ????? (13) - ?????.tv13
rolloutfile - ????? (14) - ????? - ????? - ?????.tv13
rolloutfile - ????? (14) - ????? - ?????.tv13
rolloutfile - ????? (14) - ?????.tv13
rolloutfile - ????? (15) - ????? - ????? - ?????.tv13
rolloutfile - ????? (15) - ????? - ?????.tv13
rolloutfile - ????? (15) - ?????.tv13
Process with ID 13340 has ended!
Process with ID 8048 has ended!
rolloutfile - ????? (16) - ????? - ????? - ?????.tv13
rolloutfile - ????? (16) - ????? - ?????.tv13
Process with ID 2168 has ended!
Process with ID 11288 has ended!
Process with ID 9864 has ended!
Process with ID 13888 has ended!rolloutfile - ????? (16) - ?????.tv13
```

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```
rolloutfile - ????? - ????? - ????? (3) - ?????.tv13
rolloutfile - ????? - ????? - ????? (3).tv13
rolloutfile - ????? - ????? - ????? (4) - ????? - ?????.tv13
rolloutfile - ????? - ????? - ????? (4) - ?????.tv13
rolloutfile - ????? - ????? - ????? (4).tv13
rolloutfile - ????? - ????? - ????? (5) - ????? - ?????.tv13
rolloutfile - ????? - ????? - ????? (5) - ?????.tv13
rolloutfile - ????? - ????? - ????? (5).tv13
rolloutfile - ????? - ????? - ????? (6) - ?????.tv13
rolloutfile - ????? - ????? - ????? (7) - ?????.tv13
rolloutfile - ????? - ????? - ????? - ????? (2) - ????? - ?????.tv13
rolloutfile - ????? - ????? - ????? - ????? (2) - ?????.tv13
rolloutfile - ????? - ????? - ????? - ????? (2).tv13
rolloutfile - ????? - ????? - ????? - ????? (3) - ?????.tv13
rolloutfile - ????? - ????? - ????? - ????? (3).tv13
rolloutfile - ????? - ????? - ????? - ????? (4) - ?????.tv13
rolloutfile - ????? - ????? - ????? - ????? (4).tv13
rolloutfile - ????? - ????? - ????? - ????? - ????? (2) - ?????.tv13
rolloutfile - ????? - ????? - ????? - ????? - ????? (2).tv13
rolloutfile - ????? - ????? - ????? - ????? - ????? (3).tv13
rolloutfile - ????? - ????? - ????? - ????? - ????? (2).tv13
rolloutfile - ????? - ????? - ????? - ????? - ????? - ?????.tv13
rolloutfile - ????? - ????? - ????? - ????? - ?????.tv13
rolloutfile - ????? - ????? - ????? - ?????.tv13
rolloutfile - ????? - ?????.tv13
rolloutfile - ?????.tv13
rolloutfile.tv13
Process with ID 6192 has ended!
Would you like to set the priority to one of the thread?
1. Yes
2. Exit
1
Input the number of thread: 1
1. Highest priority
2. Above normal priority
3. Normal priority
4. Below normal priority
5. Idle priority
5
```

Process Explorer - Sysinternals: www.sysinternals.com [DESKTOP-U5CRL1R\soles]

File Options View Process Find Users Help

OS3.exe:16880 Properties

TCP/IP Security Environment Job Strings
Image Performance Performance Graph GPU Graph Threads

Count: 11

TID	CPU	Cycles Delta	Suspend Count	Start Address
19412				OS3.exe!@ILT+31...
13992				ntdll.dll!TpCallback...
13892				ntdll.dll!TpCallback...
14284				OS3.exe!@ILT+10...
6208				OS3.exe!@ILT+10...
8848				OS3.exe!@ILT+10...
13248				OS3.exe!@ILT+10...
15776				OS3.exe!@ILT+10...
15824				OS3.exe!@ILT+10...
15416				OS3.exe!@ILT+10...
5520				OS3.exe!@ILT+10...

Thread ID: 14284 Stack Module

Start: 13:05:05 29.10.2020

State: Wait:DelayExecution Base Priority: 1

Kernel: 0:00:00.015 Dynamic Priority: 1

User Time: 0:00:00.031 I/O Priority: Normal

Context Switches: 90 Memory Priority: 5

Cycles: 67 595 412 Ideal Processor: 3

Permissions Kill Suspend

OK Cancel

Process	Private Delta...	Virtual Size	Peak Private Bytes	USER Objects	PF Delta	Sessi
296	5	2 151 843 ...	9 540 K	0		
078	3	48 972 K	2 064 K	0		
031	3	4 282 540 K	1 864 K	0		
062	2	2 151 757 ...	2 172 K	0		
734	7	2 151 831 ...	5 284 K	18		
875	8	4 859 728 K	29 796 K	0		
015	3	2 151 753 ...	1 728 K	0		
046	3	2 151 747 ...	1 532 K	0		
656	0	0 K	0 K	0		
140	2	4 258 728 K	2 708 K	0		
390	4	86 568 K	5 156 K	0		
296	12	2 152 120 ...	35 024 K	20		
843	10	-12 K 2 151 806 ...	9 764 K	0		
703	8	4 291 428 K	3 736 K	0		
453	20	4 339 312 K	9 084 K	0		
765	23	4 390 320 K	38 296 K	0		
171	2	4 298 492 K	3 992 K	0		
500	23	4 436 168 K	15 344 K	45		
515	58	798 848 K	1 760 K	0		7
250	47	4 400 024 K	18 076 K	0		
687	28	4 309 152 K	4 936 K	0		
000	7	4 285 908 K	6 880 K	0		
781	12	4 844 156 K	39 480 K	2		
343	88	4 503 404 K	31 020 K	0		
281	57	40 K 38 292 204...	44 672 K	0		10
703	24	4 381 508 K	14 708 K	8		
156	9	2 151 761 ...	4 184 K	0		
437	40	2 152 424 ...	380 524 K	0		5
062	10	4 341 488 K	13 032 K	2		
640	9	-76 K 2 151 791 ...	14 200 K	0		
265	20	2 151 875 ...	18 100 K	0		
578	6	4 814 960 K	30 356 K	0		
734	20	288 580 K	65 600 K	59		
796	11	59 128 K	4 868 K	1		
687	10	38 162 992...	23 312 K	0		
29	29	180 K 269 268 K	39 624 K	6		22
14	14	464 K 4 468 430 K	51 738 K	183		56

CPU Usage: 25.94%

Висновок: В ході роботи над цією лабораторною, я навчилась створювати потоки, розпалалелювати завдання та міняти пріорітет одного з потоків.