

문제해결기법(13967005)

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Chapter 7.3 Exercises

2.

```
#define _CRT_SECURE_NO_WARNINGS // or scanf_s
#include <stdio.h>
#include <math.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>
#include <ctype.h>

void change(float cash, int *quarters, int* dimes, int *nickels, int *pennies);

int main() {

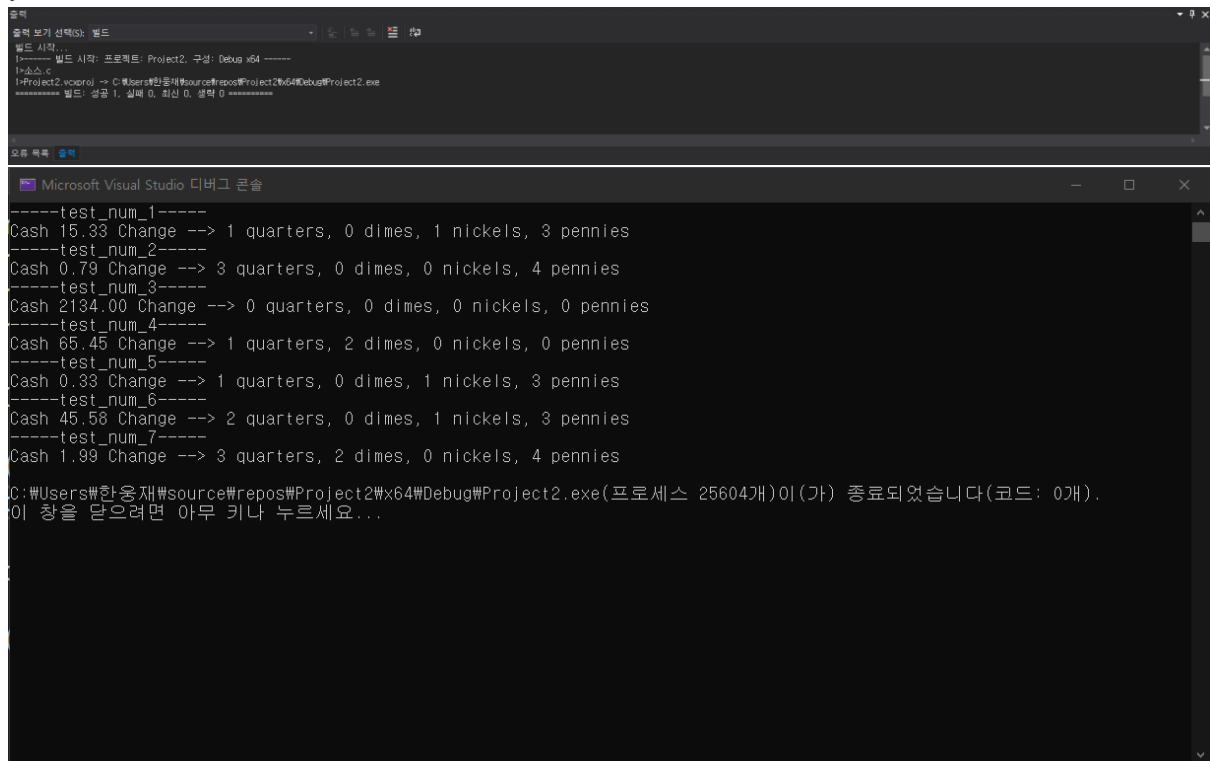
    float cash[] = { 15.33f, 0.79f, 2134.0f, 65.45f, 0.33f, 45.58f, 1.99f }; //rounding error
    int quarters=0, dimes=0, nickels=0, pennies=0;
    int test_num = 7;
    for (int i = 0; i < test_num; i++) {

        quarters = 0, dimes = 0, nickels = 0, pennies = 0;
        change(cash[i], &quarters, &dimes, &nickels, &pennies);
        printf("-----test_num_%d-----\n", i + 1);
        printf("Cash %0.2f Change --> %d quarters, %d dimes, %d nickels, %d pennies\n", cash[i], quarters, dimes, nickels, pennies);
    }
    return 0;
}

void change(float cash, int* quarters, int* dimes, int* nickels, int* pennies) {
    double cents;
    cents = floor(((cash - floor(cash))*100.0f)+0.5);
    while (cents != 0) {

        if (cents >= 25) {
            cents -= 25;
            (*quarters)++;
        }
        else if (cents < 25 && cents >= 10) {
            cents -= 10;
            (*dimes)++;
        }
        else if (cents < 10 && cents >= 5) {
            cents -= 5;
            (*nickels)++;
        }
        else if (cents < 5) {
            cents -= 1;
            (*pennies)++;
        }
    }
}
```

```
}
```



```
Microsoft Visual Studio 디버그 콘솔
-----test_num_1-----
Cash 15.33 Change --> 1 quarters, 0 dimes, 1 nickels, 3 pennies
-----test_num_2-----
Cash 0.79 Change --> 3 quarters, 0 dimes, 0 nickels, 4 pennies
-----test_num_3-----
Cash 2134.00 Change --> 0 quarters, 0 dimes, 0 nickels, 0 pennies
-----test_num_4-----
Cash 65.45 Change --> 1 quarters, 2 dimes, 0 nickels, 0 pennies
-----test_num_5-----
Cash 0.33 Change --> 1 quarters, 0 dimes, 1 nickels, 3 pennies
-----test_num_6-----
Cash 45.58 Change --> 2 quarters, 0 dimes, 1 nickels, 3 pennies
-----test_num_7-----
Cash 1.99 Change --> 3 quarters, 2 dimes, 0 nickels, 4 pennies
C:\Users\한재원\source\repos\Project2\x64\Debug\Project2.exe (프로세스 25604개)이 (가) 종료되었습니다(코드: 0개).
이 창을 닫으려면 아무 키나 누르세요...
```

3a.

```
#define _CRT_SECURE_NO_WARNINGS // or scanf_s
#include <stdio.h>
#include <math.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>
#include <ctype.h>
int secs(int hours, int mins, int ss);

int main() {

    int hours[] = {1,0,0,2,0};
    int mins[] = {30,0,0,0,10};
    int ss[] = {30,0,3,0,0};
    int test_num = 5;
    int total_secs = 0;
    for (int i = 0; i < test_num; i++) {
        total_secs = secs(hours[i], mins[i], ss[i]);
        printf("----test_num_%d---\n", i + 1);
        printf("%d hours %d minutes %d seconds --> %d seconds\n", hours[i], mins[i],
ss[i], total_secs);
    }

    return 0;
}
```

```

int secs(int hours, int mins, int ss) {
    int total=0;
    total += hours * 3600;
    total += mins * 60;
    total += ss;

    return total;
}

```

```

Microsoft Visual Studio 디버그 콘솔
-----test_num_1-----
1 hours 30 minutes 30 seconds --> 5430 seconds
-----test_num_2-----
0 hours 0 minutes 0 seconds --> 0 seconds
-----test_num_3-----
0 hours 0 minutes 3 seconds --> 3 seconds
-----test_num_4-----
2 hours 0 minutes 0 seconds --> 7200 seconds
-----test_num_5-----
0 hours 10 minutes 0 seconds --> 600 seconds
C:\Users\한재홍\source\repos\Project2\x64\Debug\Project2.exe(프로세스 28248개)이(가) 종료되었습니다(코드: 0개).
이 창을 닫으려면 아무 키나 누르세요...

```

3b.

```

#define _CRT_SECURE_NO_WARNINGS // or scanf_s
#include <stdio.h>
#include <math.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>
#include <ctype.h>
void secs(int *totSec, int hours, int mins, int ss);

int main() {

    int hours[] = {1,0,0,2,0};
    int mins[] = {30,0,0,0,10};
    int ss[] = {30,0,3,0,0};
    int test_num = 5;
    int totSec = 0;
}

```

```

        for (int i = 0; i < test_num; i++) {
            totSec = 0;
            secs(&totSec, hours[i], mins[i], ss[i]);
            printf("---test_num_%d---\n", i + 1);
            printf("%d hours %d minutes %d seconds --> %d seconds\n", hours[i], mins[i],
ss[i], totSec);
        }

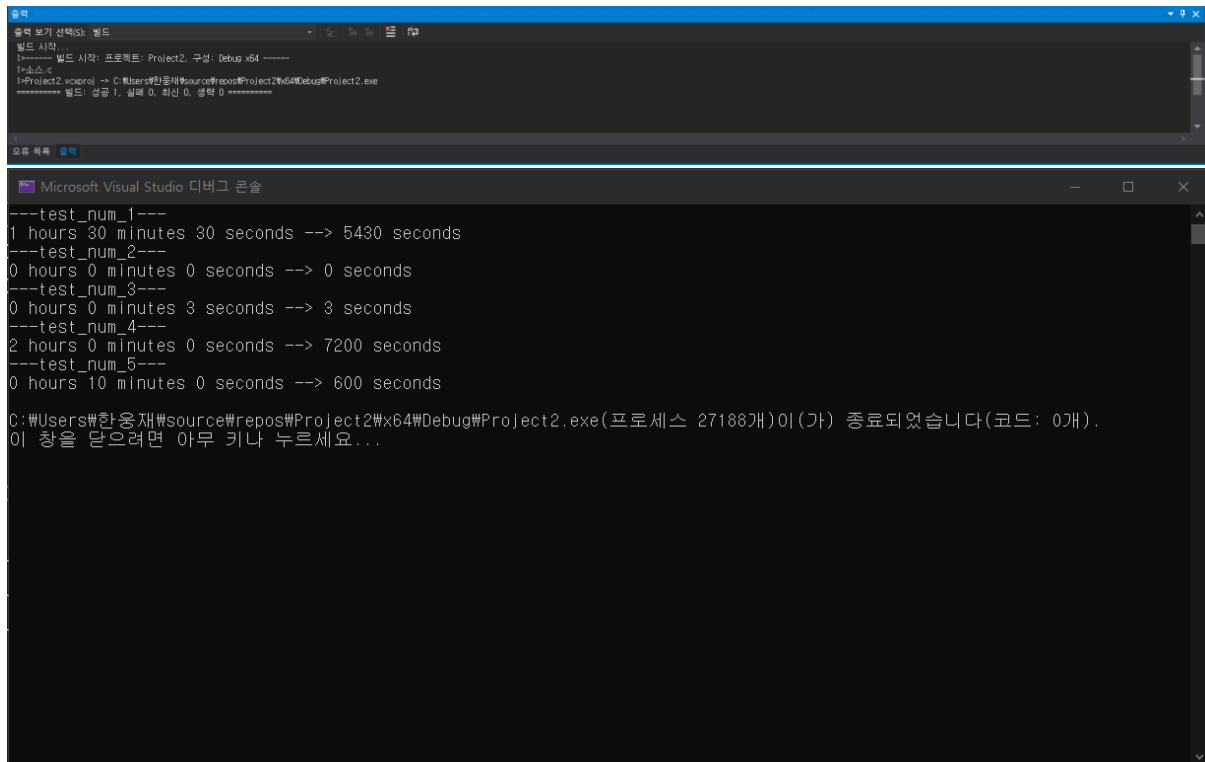
        return 0;
    }
}

void secs(int *totSec, int hours, int mins, int ss) {

    *totSec += hours * 3600;
    *totSec += mins * 60;
    *totSec += ss;

}

```



The screenshot shows the Visual Studio IDE with a C program and its output. The top window shows the source code, and the bottom window shows the output of the program.

Source Code:

```

#include <stdio.h>

void secs(int *totSec, int hours, int mins, int ss) {

    *totSec += hours * 3600;
    *totSec += mins * 60;
    *totSec += ss;

}

int main() {
    int test_num = 5;
    int hours[5] = {1, 0, 0, 2, 0};
    int mins[5] = {30, 0, 0, 0, 10};
    int ss[5] = {30, 0, 3, 0, 0};
    int totSec;

    for (int i = 0; i < test_num; i++) {
        totSec = 0;
        secs(&totSec, hours[i], mins[i], ss[i]);
        printf("---test_num_%d---\n", i + 1);
        printf("%d hours %d minutes %d seconds --> %d seconds\n", hours[i], mins[i],
ss[i], totSec);
    }

    return 0;
}

```

Output:

```

---test_num_1---
1 hours 30 minutes 30 seconds --> 5430 seconds
---test_num_2---
0 hours 0 minutes 0 seconds --> 0 seconds
---test_num_3---
0 hours 0 minutes 3 seconds --> 3 seconds
---test_num_4---
2 hours 0 minutes 0 seconds --> 7200 seconds
---test_num_5---
0 hours 10 minutes 0 seconds --> 600 seconds
C:\Users\한재웅\source\repos\Project2\x64\Debug\Project2.exe(프로세스 27188개)이(가) 종료되었습니다(코드: 0개).
이 창을 닫으려면 아무 키나 누르세요...

```

Textbook Chapter 9.4

Programming Exercise #2

```
#define _CRT_SECURE_NO_WARNINGS // or scanf_s
#include <stdio.h>
#include <math.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>
#include <ctype.h>
void liquid(int totCup, int* gallons, int* quarts, int* pints, int* cups);

int main() {

    int totCup[] = { 24,15,17,3,5,1,2,130,0 };
    int test_num = 9;
    int gallons, quarts, pints, cups;

    for (int i = 0; i < test_num; i++) {
        gallons = 0, quarts = 0, pints = 0, cups = 0;
        liquid(totCup[i], &gallons, &quarts, &pints, &cups);
        printf("-----test_num_%d-----\n", i + 1);
        printf("total cups : %d --> %d gallons, %d quarts, %d pints, %d cups\n",
totCup[i], gallons, quarts, pints, cups);
    }
    return 0;
}

void liquid(int totCup, int* gallons, int* quarts, int* pints, int* cups) {
    //pint= 2 cups
    //quart= 4 cups
    //gallon = 16 cups

    *gallons = (int)ceil((double)totCup / 16.0);

    *quarts = (int)ceil((double)totCup / 4.0);

    *pints = (int)ceil((double)totCup / 2.0);

    *cups = totCup;
}
```



```
Microsoft Visual Studio 디버그 콘솔
-----test_num_1-----
total cups : 24 --> 2 gallons, 6 quarts, 12 pints, 24 cups
-----test_num_2-----
total cups : 15 --> 1 gallons, 4 quarts, 8 pints, 15 cups
-----test_num_3-----
total cups : 17 --> 2 gallons, 5 quarts, 9 pints, 17 cups
-----test_num_4-----
total cups : 3 --> 1 gallons, 1 quarts, 2 pints, 3 cups
-----test_num_5-----
total cups : 5 --> 1 gallons, 2 quarts, 3 pints, 5 cups
-----test_num_6-----
total cups : 1 --> 1 gallons, 1 quarts, 1 pints, 1 cups
-----test_num_7-----
total cups : 2 --> 1 gallons, 1 quarts, 1 pints, 2 cups
-----test_num_8-----
total cups : 130 --> 9 gallons, 33 quarts, 65 pints, 130 cups
-----test_num_9-----
total cups : 0 --> 0 gallons, 0 quarts, 0 pints, 0 cups

C:\Users\한웅재\source\repos\Project2\64\Debug\Project2.exe(프로세스 19528개)이(가) 종료되었습니다(코드: 0개).
이 창을 닫으려면 아무 키나 누르세요...
```

Textbook Chapter 8.3

Programming Exercises 2

```
#define _CRT_SECURE_NO_WARNINGS // or scanf_s
#include <stdio.h>
#include <math.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>
#include <ctype.h>

void show(double rates[]);
int main() {

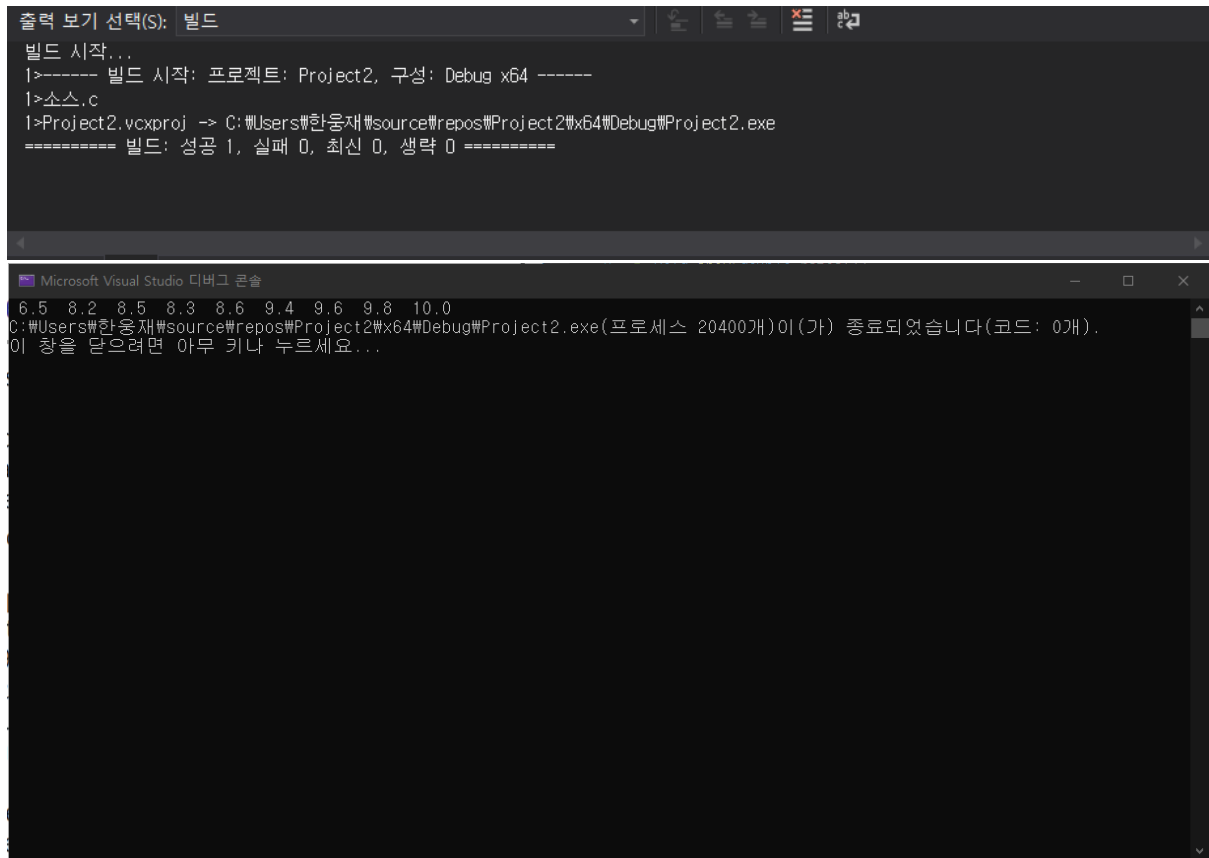
    double rates[] = {6.5, 8.2, 8.5, 8.3, 8.6, 9.4, 9.6, 9.8, 10.0};

    show(rates);

    return 0;
}
void show(double rates[]) {

    for (int i = 0; i < 9; i++) {
        printf(" %.1lf ", rates[i]);
    }
}
```

}



Programming Exercises 4

```
#define _CRT_SECURE_NO_WARNINGS // or scanf_s
#include <stdio.h>
#include <math.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>
#include <ctype.h>

void extend(double price[], double quantity[], double amount[]);

int main() {

    double price[] = { 10.62, 14.89, 13.21, 16.55, 18.62, 9.47, 6.58, 18.32, 12.15, 3.98 };
    double quantity[] = { 4, 8.5, 6, 8.35, 9, 15.3, 3, 5.4, 2.9, 4.8 };
    double amount[10];

    extend(price, quantity, amount);

    for (int i = 0; i < 10; i++) {
        printf("amount[%d] : %lf\n", i, amount[i]);
    }
}
```



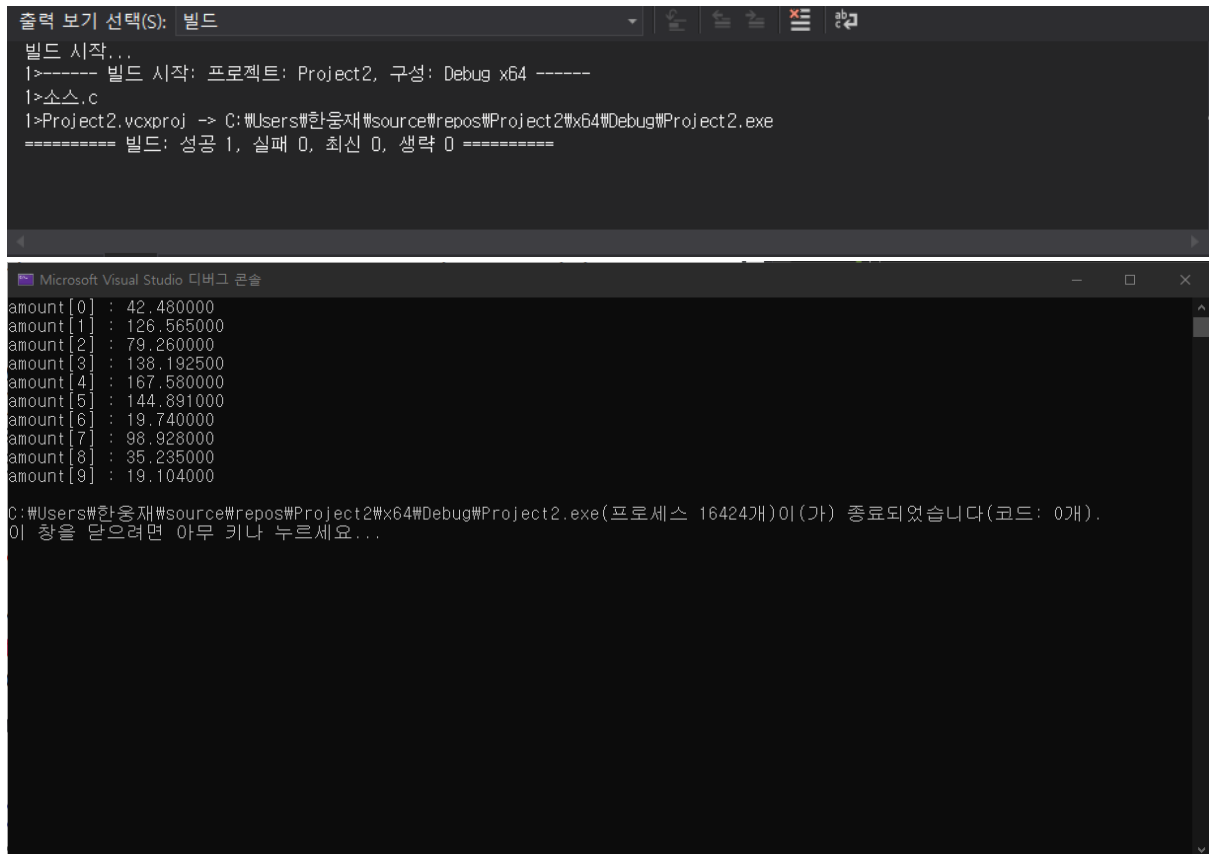
```

        return 0;
    }
    void extend(double price[], double quantity[], double amount[]) {

        for (int i = 0; i < 10; i++) {

            amount[i] = price[i] * quantity[i];
        }
    }
}

```



The image shows two windows from the Visual Studio IDE. The top window is the 'Output' window, showing the build process for 'Project2' in 'Debug x64' mode. It indicates a successful build with no errors or warnings. The bottom window is the 'Debug Console', which displays the output of the program. It lists the values of the 'amount' array for indices 0 through 9, followed by a message indicating that the program has finished execution.

```

출력 보기 선택(S): 빌드
빌드 시작...
1>----- 빌드 시작: 프로젝트: Project2, 구성: Debug x64 -----
1>소스.c
1>Project2.vcxproj -> C:\Users\한웅재\source\repos\Project2\x64\Debug\Project2.exe
===== 빌드: 성공 1, 실패 0, 최신 0, 생략 0 =====

Microsoft Visual Studio 디버그 콘솔
amount[0] : 42.480000
amount[1] : 126.565000
amount[2] : 79.260000
amount[3] : 138.192500
amount[4] : 167.580000
amount[5] : 144.891000
amount[6] : 19.740000
amount[7] : 98.928000
amount[8] : 35.235000
amount[9] : 19.104000

C:\Users\한웅재\source\repos\Project2\x64\Debug\Project2.exe(프로세스 16424개)이(가) 종료되었습니다(코드: 0개).
이 창을 닫으려면 아무 키나 누르세요...

```