PD2 2023

HW1

Homework Description:

Given an Integer value N as the input (from command line arguments), please list all combinations "line by line" to the underline console in the form of "(X,Y)", where X+Y=N, X>=0 and Y>=0. The output should be sorted by X in ascending order. Please also show the maximum value of X*Y in the last line.

Deadline:

2023/3/15 23:59 (Wed.).

HW1 should be submitted before the deadline. No excuse to submit your code after the deadline. TA will copy your code at 2023/3/16 0:01. If your code is not in the hw1 Folder, you will get score '0'.

Environment:

1. uname -a
   Linux version 5.15.0-67-generic (buildd@lcy02-amd64-116) (gcc (Ubuntu 11.3.0-1ubuntu1~22.04) 11.3.0, GNU ld (GNU Binutils for Ubuntu) 2.38) #74-Ubuntu SMP Wed Feb 22 14:14:39 UTC 2023
2. IP: 140.116.246.230
3. Please remember you should connect to the server with a NCKU IP. Make sure you use NCKU VPN or connect to the server in our school.

Example:

When N=5. The output will be (print in the console):

```
(0,5)
(1,4)
(2,3)
(3,2)
(4,1)
(5,0)
6
Input:
5
```

Output:

```
(0,5)
(1,4)
(2,3)
(3,2)
(4,1)
(5,0)
6
```

Note:

1. N>0 and N<1000.
2. Remember to order the output by X line by line. We will examine your correctness by our shell script without any excuse.
3. Please list the result to console. We will use the shell operator ">" to an output file named "result".
4. You need to declare the executable file named "**hw1**" which will be generated by using your makefile with "make all".
5. We will only give a single integer as the input. You don't need to take care of any datatype exception.
6. For the convenience of checking your homework, **Output** must not contain any blank characters or other characters, otherwise your score will be deducted.
7. If you know how to use scp (you may use Windows-based PowerShell), you could try scp in powershell like:

```
scp hw1.cpp ktchuang@140.116.246.230:~/hw1
```

Correct format :

```
(0,5)
(1,4)
(2,3)
(3,2)
(4,1)
(5,0)
6
```

Incorrect format :

```
(0,5)        (<<blank characters)
(1,4)
```

```
(2,3)
(3,2)
(4,1)
(5,0)
6
```

How to Submit:

Please pay attention to the following instructions when submitting homework:

1. Under your account folder, create the folder named "**hw1**".

   (*Please note that you must pay attention to the <u>correct capitalization</u>. If we cannot correctly copy the folder hw1, you will get score '0'.)

2. Put every necessary files under the folder, including :
   i.   Your **main program**, such as main.cpp, main.h, program.h, etc.
   ii.   **makefile** (*Name your executable file as "hw1")
3. Make sure it works normally under the folder and all files are in the correct path.

Examples of files in your folder:

```
netdb@2023pd2:/home/vs6112030/hw1$ pwd
/home/vs6112030/hw1
netdb@2023pd2:/home/vs6112030/hw1$ ls
hw1  main.cpp  makefile
```

How we execute:

```
netdb@2023pd2:/home/vs6112030/hw1$ make all
netdb@2023pd2:/home/vs6112030/hw1$ ./hw1 150 > result_150
```

```
netdb@2023pd2:/home/vs6112030/hw1$ diff -q result_150
/home/share/hw1/result_150
netdb@2023pd2:/home/vs6112030/hw1$ diff -q result_340
/home/share/hw1/result_340
netdb@2023pd2:/home/vs6112030/hw1$ diff -q result_570
/home/share/hw1/result_570
```

Example code of reading command line arguments:

```cpp
#include <iostream>
using namespace std;

int main(int argc, char** argv)
{
    cout << "You have entered " << argc
        << " arguments:" << "\n";

    for (int i = 0; i < argc; ++i)
        cout << argv[i] << "\n";

    return 0;
}
```