Programming Assignment #3: Combinational Sum

(due 23:59, Nov 18th, 2020)

Objective:

In this programming assignment, you need to write a C++ program to pick up all possible combinational numbers whose sum equal to the target number from a given series.

Provided files:

(1) ***main.cpp***: it checks the answer *check()* and can be modified for debugging.

(2) ***Solve.cpp*** & ***Solve.h***: these are the program files you need to implement. The function ***solve::calculate(int, int, int, vector<int>, vector<vector<int>>&)*** is the function you need to program which takes target number, limit times, # candidates, candidate array, and vector<vector<int>>& as inputs, and you should store your answer in the vector<vector<int>>&.

(3) ***testcase***: this is an exemplary input test case, which can be used to test your program. It can be modified if you want to change it.

Implementation Details:

Input format:

<Target number> <Limit> <Number of candidates>
<Candidates……>
*Limit: The maximum number of negative candidates to be used in a solution

Check file format:

Number of solutions = n
<# of selected candidates in Solution 1 > <Solution 1 ……>
<# of selected candidates in Solution 2 > <Solution 2 ……>
……
<# of selected candidates in Solution n > <Solution n ……>

Example:

Input	Check file
7 0 4 2 3 6 7	Number of solutions = 2 3 2 2 3 1 7

1 1 4 -4 -3 -1 5	Number of solutions = 1 2 –4 5 3 -3 -1 5 => wrong answer due to exceeding negative numbers

Constraints:

Input:

1. Target number will be an integer between ±**10000**.
2. Limit will be no more than **2**.
3. Candidates will be integers between ±**1000** excluding 0.
4. The number of candidates will be no more than **300**.

Storage format in **vector<vector<int>>**:

1. Store your solutions of a case in a **vector<vector<int>>**.
2. You **do not** need to sort your answer.
3. We will check your answers by checking your **number of solutions** and comparing the **times all candidates appear** in your case with that in the correct answer

Language:

C++.

Platform:

You may develop your software on UNIX/Linux.

Compile: $ g++ main.cpp -o hw3

Execution: $ ./hw3 <input file>

Submission

Please compress the following files into a zip file and name it by your ***name and student ID***. For example, **"HW3_0850281_陳柏諺.zip"**. Then upload the compressed file to the new E3 website by the deadline (Nov 18th,2020).

(1) solve.h

(2) solve.cpp

Grading policy:

(1) Example case correctness (60%)

(2) Hidden case correctness (10%)

(3) Hidden case ranking (30%, ranked by run time)