Random notions that pop out in computer science:

* When declaring variables PUT INITIAL VALUES!!!!!
* If I need many inputs on the same line, I can use
  + Cin>>input1>>input2>>input3;
  + Then, I can save those values into a vector.
* AAAAAA WHEN OPENING THE FILE answer\_file.cpp YOU HAVE TO OPEN THE WHOLE FOLDER AND NOT JUST THE FILE!
* Lexicographically smaller:
  + (meaning that, in the alphabetical order, the string comes before. Aabn is lexically smaller than aac)
    - Function to do it: [C++ algorithm lexicographical\_compare() function - javatpoint](https://www.javatpoint.com/cpp-algorithm-lexicographical_compare-function#:~:text=C%2B%2B%20Algorithm%20lexicographical_compare%20%28%29%20function%20is%20used%20to,binary%20comparison%20function%20comp%20for%20the%20second%20version.)
* Happy numbers:
  + a number which eventually reaches 1 when replaced by the sum of the square of each digit. To determine that a number is not a happy number, we just have to find a loop where the numbers will infinitely continue without reaching 1.
* Kadane’s algorithm:
  + https://www.baeldung.com/java-maximum-subarray#:~:text=Dynamic%20Programming%201%203.1.%20Kadane%27s%20Algorithm.%20Kadane%27s%20algorithm,3%203.3.%20Implementation.%20...%204%203.4.%20Complexity.%20
    - <https://www.youtube.com/watch?v=jnoVtCKECmQ>
    - \*Another cool thing I learned is that there is a function in c++ to return the max value and the min value our of two values
      * Max(value\_1, value\_2)
  + We first start by saving a variable for the biggest value until now
  + As well as a variable for the sum of all values from a predefined position.
  + Basically, we want to loop through all the elements in the array once.
    - Then, at every element, we ask ourselves:
      * If the current\_value is bigger than the sum of all the values in the defined subarray
        + We start a new subarray with this value itself
      * If the current\_value is smaller than the sum of all the value in the defined array.
        + We add this value to the sum of the current subarray
      * Then, we check if the value of the sum of this subarray is bigger than the max that we have found now.
        + If ye, then switch the value of the max
    - Return max
* Text

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* Do not forget how to convert from binary to decimal!
  + Graphical user interface, text, application, email

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  + –
  + In python, there is a function, bin(), that converts from decimal to binary
  + The more exotic manner is to use the log base 2 of a num, to floor that value, which returns the value of the biggest 2^n
    - Then, I can substract from my initial value, this newfound value, which gives me the remainder that I have to find the binary for. Then, I can perform this operation as many times as I need until I have found that num = 0
      * Ex: converting 30:
        + The biggest number that is smaller than 30 is 16 (2^4)
        + I thus substract 30-16 = 14, and continue the same thing with 14, but knowing that the fourth digit is a 1.

Etc.etc.etc.

* TO determine if the sum of two numbers is divisible by another one, I can just take the modulo of both, and check if it adds to 60 or 0 (0 meaning that both numbers could already be / by 60, and 60 meaning that their sum can).

Useful C++ functions to know!!!

Text

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Ints and floats--------------------------------------

Different ways of rounding:

#include <cmath>

Table

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Getting the type of a variable

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Converting from one type to the other

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Converting strings to list and vice-versa:

Simply loop

For(int I = 0; I<string\_or\_vector.size(); i++){

Push\_back

OR

+=

}

Strings and vectors ~~lists~~ -------------------------------------

Erasing stuff:

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Inserting stuff:

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Finding characters:

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(with lists, you should just loop – as it returns an error)

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--- If I wanted to replace stuff, I could just use a loop that finds, erases and inserts at the same index.

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Substrings:

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List (NOT THE SAME AS VECTORS) splicing (basically substring for vectors) ([list splice() function in C++ STL - GeeksforGeeks](https://www.geeksforgeeks.org/list-splice-function-in-c-stl/#:~:text=The%20list%3A%3Asplice%20%28%29%20is%20a%20built-in%20function%20in,list%20x%20into%20the%20list%20at%20some%20position.)) – very specific usecases

For vectors, I would use:

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A bunch of ways to delete and append elements in a vector and a string:

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Last two functions:

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Comparing strinsg;

[3 Ways to Compare Strings in C++ - JournalDev](https://www.journaldev.com/37330/compare-strings-in-c-plus-plus#:~:text=C%2B%2B%20has%20in-built%20compare%20%28%29%20function%20in%20order,smaller%20as%20compared%20to%20the%20second%20string%20input.)

Here is an example of using strcmp

Graphical user interface, text, application

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Upper to lowercase, etc

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Sorting vectors

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Magic Squares;

1. The sum of a non-repeating 3x3 magic square is 15 for every row, column and diagonal.
2. The values are non-repeating, meaning they sum to 45
3. The answer is always the same, just a 90 degree rotation

Sums;

If each number separately is NOT a multiple of a number

AND the sum of their REMAINDERS is not a multiple of a number

Then the two numbers added together ARE NOT a multiple of a number