Solution

Problem 1: Encrypt and decrypt text file using C++ (122090007_A2_Encrypt.cpp)

The program defines a class "encdec". It has two functions, encrypt() and decrypt(). First the program uses getline() to get the input. We derive the key from the first line, and use key_convert() to convert the key to 0-25. The second line we derive the method encrypt or decrypt. When dealing with decrypt, we multiply key with -1 to convert it. We then use the function of the method to derive the output.

Problem 2: CSV data file management using C++ (122090007_A2_CSV.cpp)

If you would like to see the output csv file, please uncomment the line `create(text, "output.csv")` to generate the csv file.

The program stores the text using a `vector< vector<string> >`. The first vector stores the single data of each row, the second vector stores all the row vector. After we get the text, we recognize the command "update" or "remove". And then we use the update() or remove() to construct the text. Finally we use the create() to generate the output csv file and print the result.

Problem 3: Credit card validation by Luhn algorithm using C++ (122090007_A2_Credit_card.cpp)

The program first sum all double even place number using sum_Double_EvenPlace(). We also use a getDigit() to add up the two digits to get a single-digit number. Then we use sum_OddPlace() to get the result. We then use isValid() to judge whether the sum of two result can be divisible by 10 and print the result.

Problem 4: C++ Program for the Tower of Hanoi puzzle (122090007_A2_Hanoi.cpp)

The core functions of the program are hanoi(). It use recursion to solve the Hanoi tower problem. The base condition is 1 disk, we directly move disk form rod A to rod C. When there are more disk, we first move all disk except the largest one from A with auxiliary of C to B, then we move the largest one from A to C. then we move disks at B with auxiliary A to C. We also have a process_print() function to print out the process. If you would like to see the whole process, please uncomment the two lines of `process_print(rods)`.