*Updated Friday, April 28, 2017*

**High School Coding Contest Saint Anselm College**

**Saturday, April 29, 2017 @9:00-11:00 AM**

**Contest Problems** *I code therefore I am!*

**General:** we do not test for invalid input.

**Problem 1. Time worked**

Write a program that computes the total time needed to finish all n problems at a coding contest. The program will ask for the number of problems n, and the corresponding time needed to solve each problem. Times should be input in the format HH:MM where H, M are digits (0-9). The program will display the resulting time in 2 formats: in minutes (ex: 127 min) and hour and minutes (ex: 2 h 7 min). The answer 2 h 67 min is not acceptable, it should be 3 h 7 min. Also the answer 3 h 0 min is not acceptable, it should be just 3 h.

Example1. Input: Enter n? 3

Enter hours worked? 01:23 00:34 00:07

**Output: 124 min = 2 h 4 min**

Example2. Input: Enter n? 4

Enter hours worked? 01:03 00:34 00:07 02:00

**Output: 224 min = 3 h 44 min**

Example3. Input: Enter n? 3

Enter hours worked? 00:00 01:11 02:22

**Output: 213 min = 3 h 33 min**

**Problem 2. Duck Duck Goose problem**

There are N of children sitting in a circle. You go around the circle and eliminate the Kth child until all children have been removed. Write a program that simulates the elimination process. The user should be prompted to enter values for N and K. The output should list the children in the order in which they are removed. You assume the initial order of children is 1 2 .. N

Example1. INPUT: Enter number of children, N? 5

Enter K? 3

OUTPUT: 3 1 5 2 4

Example2. INPUT: Enter number of children, N? 7

Enter K? 3

OUTPUT: **3 6 2 7 5 1 4**

**Problem 3. The Word Vortex**

Write a program that accepts a word of length **N** (1 <= N <= 30) and draws concentric squares as borders in the following manner: for each character a border is made, from outside to inside and filled with the corresponding letter.

Example1. INPUT: Enter string? JOE

OUTPUT: JJJJJ

JOOOJ

JOEOJ

JOOOJ

JJJJJ

Example2. INPUT: Enter word? MARK

OUTPUT: MMMMMMM

MAAAAAM

MARRRAM

MARKRAM

MARRRAM

MAAAAAM

MMMMMMM

**Problem 4. People in a Boat**

There are N people on the shore (from 1,.. N) and you have a boat with a capacity to transport K people. List all possible ways you can load the boat. The order in which you list the people taking the boat does not matter.

Example1:

Enter N and K? 4 2

Output: 1 2 1 3 1 4 2 3 2 4 3 4

Example2:

Enter N and K? 5 3

Output: 1 2 3 1 2 4 1 2 5 1 3 4 1 3 5 1 4 5 2 3 4 2 3 5 2 4 5 3 4 5

**Problem 5. Prime all over**

Print the **greatest** prime numbers with 1 digit, 2 digits, up to 7 digits that have this property: as you read the number from left to right, wherever you stop, the number should be prime. (Program should run in less than 40 secs)

Example: ABCD should have this property:

A is prime

AB is prime

ABC is prime

ABCD is prime

ABCD should be the greatest number on 4 digits with this property

OUTPUT: seven integers on one line