

**High School Programming Competition**  
**Saint Anselm College, Saturday, April 5, 2014 @9:00-11:00 AM**  
**Contest Problems**

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**Problem 1.**

**Word in a triangle.** Program will ask you for an integer  $n$ ,  $n > 0$ , that is the number of lines and program writes the word TURING each time on a different row with increasing numbers of letters, starting with 1 letter. When word finishes it takes again the letters from the beginning. If input is not correct prints "error" and asks again.

Input: Enter n? 8

OUTPUT:

```
T
TU
TUR
TURI
TURIN
TURING
TURINGT
TURINGTU
```

**Problem 2**

**Scramble word.** The program asks for a word and scrambles it. Then it prints the number of letters that are in the same position as the original word.  
 Each time you run the program a different scrambled solution should be provided (well, it is random some might be the same..)

Example 1:

Enter word? TURING

OUTPUT:

```
TUGINR
#same positions = 4
```

Example 2:

Enter word? TURING

OUTPUT:

```
UGINRT
#same positions = 0
```

**Problem 3.**

**Ann's friends.** Ann has 4 friends Ben, Corry, Dan, Emily. They play in a circle and count till  $n$  starting with Ann, then Ben, then Corry, then Dan, then Emily. The  $n$ th child will get out of the circle and the counting begins from the next person in the circle ( $n+1$ ). They do this till just one of them is remaining. The program asks you  $n$ , and will display the order in which the children get out of the circle. If  $n$  not valid it will ask again.

Example 1:

Enter

Enter number? 3

OUTPUT:

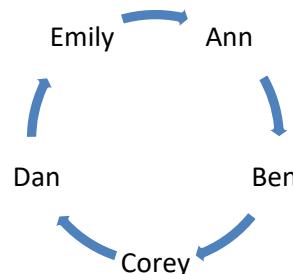
Corry, Ann, Emily, Ben, Dan

Example 2:

Enter number? 6

OUTPUT:

Ann, Corry, Ben, Emily, Dan



**Problem 4.**

**Fill canvas with circles:** Enter the size of your squared canvas (int size x size) and the number of circles you want per row and column (int n). The circles all have the same radius, and fill the canvas with largest radius possible for each circle such that the circles do not overlap. The program should print the radius of the circles and their centers, represented as integers. The output needs to follow the format of the examples.

*Example:*

Input:

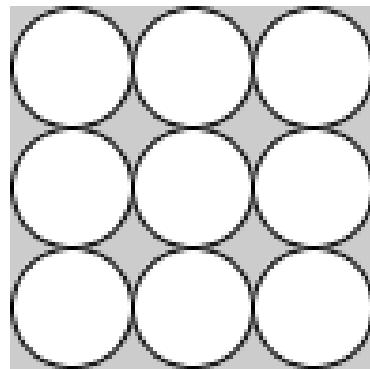
```
Canvas size? 100
Number of circles, n? 3
```

Output:

radius= 16

```
(16 16) (16 48) (16 80)
(48 16) (48 48) (48 80)
(80 16) (80 48) (80 80)
```

In this canvas n = 3

**Problem 5**

**English to Integer:** Write a program that takes an English number as input and returns the corresponding integer. It should work with all integers from 999,999,999 to 0. You should have a space between each word and do not need to compensate for any additional words or symbols such as "five hundred and seven" or "twenty-three". Input is not case sensitive.

*Example 1:*

INPUT: Enter words? Fifty five

OUTPUT: 55

*Example 2:*

INPUT: Enter words? three hundred thousand twelve

OUTPUT: 300012

*Example 3:*

INPUT: Enter words? nine hundred fifty four million six hundred eighty three thousand seven hundred twenty one

OUTPUT: 954683721

*Example 4:*

INPUT: Enter words? Twenty hundred

OUTPUT: I do not understand