Introduction to Computers and Programming LAB-5 2014/10/15

- ✧ You cannot use **Selection Statements** (if, else …) or **Iteration Statements** (for, while) even if you have learned them.
- ✧ Your output must be in our sample output format.

1. Write a program that reads an integer entered by the user and displays it in octal (base 8):
   The output should be displayed using five digits, even if fewer digits are sufficient. Hint: To convert the number to octal, first divide it by 8; the remainder is the last digit of the octal number. Then divide the original number by 8 and repeat the process to arrive at the next-to-last digit.

```
Enter a number between 0 and 32767: 1953
In octal, your number is: 03641
請按任意鍵繼續 . . .
```

2. Write a program that allows a user to enter a temperature (**degrees Fahrenheit,**°F), and transforms the temperature to **degrees Celsius (**℃**)** and **Kelvin (K)**.
   Formulas:

   $[^\circ C] = ([^\circ F] - 32) \times 5/9$

   $[K] = [^\circ C] + 273.15$

   Precision in output: display 3 digits after the decimal point.

```
Please enter °F:  55.66
°C= 13.144
K= 286.294
```

3. Write a program that calculates the remaining balance on a loan after the first, second, and third monthly payments:
   Display each balance with two digits after the decimal point. Hint: Each month, the balance is decreased by the amount of the payment, but increased by the balance times the monthly interest rate. To find the monthly interest rate, convert the interest rate entered by the user to a percentage and divided it by 12.

```
Enter amount of loan: 20000.00
Enter interest rate: 6.0
Enter monthly payment: 386.66
Balance remaining after first payment: $19713.34
Balance remaining after second payment: $19425.25
Balance remaining after third payment: $19135.71
請按任意鍵繼續 . . .
```

4. *Old McDonald had a farm,*

   Ei-I-Ei-I-O

   And on this farm he had a chick

   Ei-I-Ei-I-O

   With a chick chick here

   And a chick chick there,

   Here a chick, there a chick,

   Everywhere a chick chick,

   Old McDonald had a farm

   Ei-I-Ei-I-OOOO

   Old McDonald is a farmer who raises chicken. He always fills a farm with a lot of chicken, and the space is so small that chicken must feel suffocated and melancholy. Today, he wants to construct a new farm. Here are totally L meter long of wood farm fence (L will be even number), and we need to use them to enclose rectangular plot of the farm.
   How to maximize the area of the farm, if the length and the width should all be integer.
   For example, If L is 14, the maximum area of the farm should be 3*4 = 12.
   Let's help Old McDonald to make more money ☺

```
Enter the length of L: 14
The maximum area of the farm is 12
請按任意鍵繼續 . . .
```

5. (Bonus) Write a program to solve two equations with two unknowns.
   ax+by = c
   dx+ey = f
   Note: the answer x, y should be rounded to 2 place after decimal point.

```
Enter the variable a,b,c,d,e,f: 1 2 3 4 5 6
solve the equation:
1x+2y=3
4x+5y=6
The answer x=-1.00, y=2.00
請按任意鍵繼續 . . .
```