Lab02

1. **Homework Problem I**

   (a) Write a program that prompts for and reads a floating-point value. The program prints the whole part and the decimal (fraction) part with the following output format. One variable only.

   Input: 123.456

   Output: 123.456 = 123 + 0.456

   (b) Write a program that accepts an integer between 7 and 9 digits long and prints the integer with commas between every third digit starting from the right. One variable only.

   Input: 12000078

   Output: 12,000,078

2. **Homework Problem II**

   (a) The effective resistance of a parallel circuit with five parallel resistances is given by:

$$R = \frac{\mathbf{1}}{\mathbf{1}/\boldsymbol{R1} + \mathbf{1}/\boldsymbol{R2} + \mathbf{1}/\boldsymbol{R3} + \mathbf{1}/\boldsymbol{R4} + \mathbf{1}/\boldsymbol{R5}}$$

   Read these five resistances from the keyboard and calculate the effective resistance *R*. Two variables (one double and one int) only.

   Input: 2 2 2 2 2

   Output: 0.4

   (b) Solve a set of simultaneous equations:

$$ax + by = c$$

$$dx + ey = f$$

   Input data: 1 2 3 4 5 6

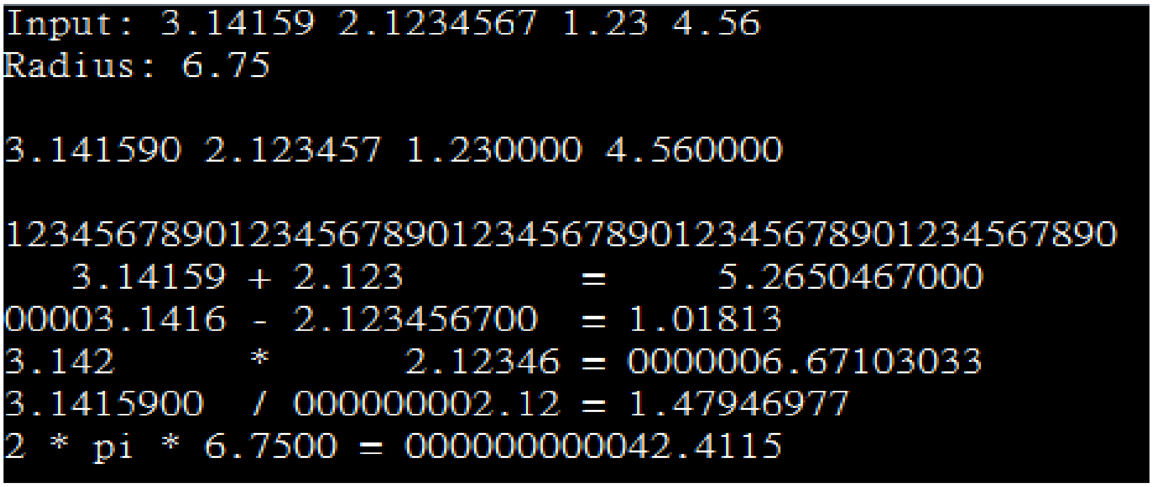
   Output: x = -1, y = 2

3. Output Format Practice

Find out and correct the compile errors of the following codes and run the program to make the output is the same as following output figure. Notice that You should not modify the space in printf(). Please complete each formula with only one printf().

```
#include”sdtio.h”


int main(void)
{
   double 1n n2 n3 n4
   float radius
   const float Math PI

   printf("Input: ");
   scanf("%f%f%f%f\n," 1n 2n 3n 4n);
   printf("Radius: ");
   scanf("%f\n," radius);

   Math PI = 3.14159;

   printf(\n%f %f %f %f\n, n1 n2 n3 n4);
   printf(“\n1234567890123456789012345678901234567890123456789\n”);
   printf(“%lf + %lf = %lf\n, n1 n2 n1+n2”);
   printf(“%lf - %lf = %lf\n, n1 n2 n1-n2”);
   printf(“%lf * %lf = %lf\n, n1 n2 n1*n2”);
   printf(“%lf / %lf = %lf\n, n1 n2 n1/n2”);
   printf(“2 * pi * %f = %f\n, radius (2*Math PI*radius)”)

   return 0;
}
```

Sample Input/Output:

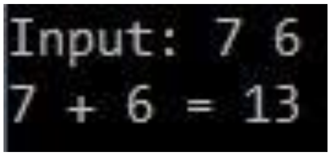


```
Input: 3.14159 2.1234567 1.23 4.56
Radius: 6.75

3.141590 2.123457 1.230000 4.560000

12345678901234567890123456789012345678901234567890
   3.14159 + 2.123        =     5.2650467000
00003.1416 - 2.123456700  = 1.01813
3.142      *      2.12346 = 0000006.67103033
3.1415900  / 000000002.12 = 1.47946977
2 * pi * 6.7500 = 000000000042.4115
```

4. Simple Adder

Please write a program to calculate summation of two positive integer numbers without using operator +,-,*, and /. You only can use bit operator such as &, |, ^, ~, <<, >>, &=, |=, ^=, <<=, and >>=. Please prompt user to input two positive integer numbers smaller than 8 and output the answer as following example.

Sample Input/Output:



```
Input: 7 6
7 + 6 = 13
```

Hint: Consider 1-bit case

Sum:	Carry:
0 + 0 => 0	0 + 0 => 0
0 + 1 => 1	0 + 1 => 0
1 + 0 => 1	1 + 0 => 0
1 + 1 => 0	1 + 1 => 1
=> using XOR	=> using AND

Please complete following program.

```
#include<stdio.h>

int main()
{
   int x, y, carry, sum=0;

   printf("Input: ");
   scanf("%d%d", &x, &y);
   printf("%d + %d = ", x, y);

   sum |= (x&1)^(y&1);
   carry = (x&1)&(y&1);

   x>>=1; y>>=1;
   // Please complete the rest part
   ……

   return 0;
}
```