PDS Lab Section 3

January 24, 2018

PROGRAM HEADER

- Every program must start with a comment containing
  - Section No.
  - Machine no.
  - Roll No.
  - Name
  - Assignment No.
  - A one line description of the assignment

EXAMPLE HEADER

```
/*****************************
*     Section 3
*     M/c No  :   65
*     Roll No  :  17CS30001
*     Name    :  Rajat Subhra Chakraborty
*     Assignment No : 3a
*     Description : Program to find area of a circle
*****************************/
```

NAMING YOUR PROGRAM

- There will be one C file for each assignment

- Name your C file **5_m_n.c** where **m** is your machine no., and **n** is the assignment no. For example,

  - **5_12_3a.c** if you are sitting in machine no. 12 and this file is for assignment no. 3a

  - **5_6_4b.c** if you are sitting in machine no. 6 and this file is for assignment no. 4b

- Your filename **must end** with **.c** for it to work

ASSIGNMENTS

ASSIGNMENT 3A

- Read and integer n. Then read n integers and print the second largest among them.

ASSIGNMENT 3B

- Cosine function can be expressed as the following series:

$$cosine(x) = 1 - (1/2!)x^2 + (1/4!)x^4 - (1/6!)x^6$$

- Write a program which shall take a floating point variable x and evaluate the above cosine series to the 5th decimal point of accuracy and print the approximate value of cosine(x).

- Your program should compute each successive term based on the previously computed terms

- You cannot use any mathematical function from the math library

ASSIGNMENT 3C

- Read in a positive integer X less than 10000. If the user enters an integer that is out of range, he/she should be asked to enter it again. This should continue in a loop until the user enters an integer within the range

- Reverse the integer X and store it in an integer Y. Print out both X and Y

- Check if X and Y are palindromes or not and print a suitable message
  - A palindrome is a number that reads the same when read from left-to-right or right-to-left.
  - Examples:
    - If X = 1782, then Y = 2871, and they are not palindromes
    - If X = 1771, then Y = 1771, and they are palindromes
    - If X = 1780, then Y = 871, and they are not palindromes

PRACTICE PROBLEMS (NOT TO BE SUBMITTED)

- Two numbers are said to be co-primes or relatively prime if they do not have any common positive factor other than

- Read in an integer n. Then print out all pairs of co-primes in the integers 2 to n.

- For example, if you enter 6, the output should look like

    (2,3) (2,5) (3,4) (3,5) (4,5) (5,6)

PRACTICE PROBLEM (NOT TO BE SUBMITTED)

- Consider two integers x and y. We will call the numbers a "product cover" if the numbers satisfy the following properties
  - All digits in x and y are distinct
  - All digits in the product of x and y are distinct
  - x, y and the product xy together contains the all of the digits 1 to 9 exactly once
- Examples:
  - 18 and 297 (18 x 297 = 5346, and 18, 297, and 5346 together has the digits 1 to 9 exactly once)
  - 4 and 1738 (4 x 1738 = 6952)
- 32 and 74 is not a product cover as 32 x 74 = 2368, and 2 and 3 are repeated between 32 and 2368; also all 9 digits are not present

- Read in 2 integers x and y
- Print if they form a product cover or not
- You cannot use an array
- Steps to follow
  - Compute product of x and y and store it in z
  - Count the no. of digits in x, y, and z. The total no. of digits must be 9, or it is not a product cover; print and exit
  - For each digit in x
    - Check if the digit occurs in x more than once
    - Check if the digit occurs in y
    - Check if the digit occurs in z
    - If the answer to any of the above is yes, it is not a product cover; print and exit
  - Repeat for each digit in y and z
- If all tests above pass, it is a product cover; print and exit
- While counting/separating digits of x, make copy of x (in another variable), and use it, do not change a as you will need it later. Same for y and z