CPRE 185 – Introduction to Computer Engineering and Problem Solving I
Spring 2018, Iowa State University
100 Points

HOMEWORK 3 – Basic input/output, Variables

Submission Instructions

1. **Submission** – Submit through Blackboard by **Feb 6, 2018 3.00 PM**
   ONLY 3 SUBMISSION ATTEMPTS ALLOWED IN BLACKBOARD
   ONLY LAST SUBMISSION WILL BE GRADED

2. **Homework submission – Theory questions must be neatly typed and submitted through Blackboard as WORD or PDF document only.**

3. **Source code submission – Source code must be uploaded as C file with .c extension for coding exercises. Append the homework number and problem number to the source code file name. For example, *cpre185_hwk1_problem2.c* .**

4. **DO NOT paste source code in WORD/PDF file. Zero credit will be given for source code uploaded as WORD/PDF file.**

5. **Concise and meaningful comments must be provided for the instructor/grader to understand your source code. Failure to include adequate comments in your code will result in deduction of 50% of the maximum credit for the coding exercise.**

6. **Include the following at the TOP of your source code file (using C style comment syntax). Failure to include the below in your code will result in deduction of 50% of the maximum credit for the coding exercise.**

```
/*********************************************/
/*** CPRE 185 – Homework 'Put homework number HERE' ***/
/*** *****************************************/
/*** Author – 'Your Full Name'  ****/
/*** Lab section – 'Your Lab section'  ****/
/*** Date started – 'Date started coding' ****/
/*** Comments – 'general comments about this code' *****/
/*********************************************/
```

7. **Zybook exercises – Complete Zybook activities in the E-book itself. Do not upload Zybook exercises on Blackboard. Zybook exercise are for your practice only. These exercises will NOT be graded.**

8. **NOTE: Use meaningful variable names. Use parenthesis to group terms in expressions for better readability.**

9. **Provide meaningful information to user when expecting scanf inputs. For example, '*Enter your height:*' before expecting an input through scanf.**

10. **Code MUST compile and work completely for receiving FULL points. Partial points may be awarded at the discretion of the grader.**

Do not use loops, arrays for the following programming exercises. Zero credit for use of loops, arrays.

Upload source code (one per problem) for all the below exercises.

1. Write C code to compute the following math function. Variable **x** is a real number. You may NOT use math library functions. Prompt (using scanf) the user to enter **x**. [30]

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!}$$

   5! = 5 x 4 x 3 x 2 x 1
   4! = 4 x 3 x 2 x 1

2. Write C code to compute the math function in problem 2 using the ***pow*** math library function to compute the powers of **x**. [30]

3. Write C code for the following. You may use math library functions. [20]
   a. Prompt the user to enter a point in two dimensional Cartesian co-ordinate system.
   b. Convert the Cartesian point to a Polar co-ordinate system point.

   https://www.mathsisfun.com/polar-cartesian-coordinates.html

4. Write C code to display the initial and final configuration of Tower of Hanoi puzzle. The below is a sample text based display of Tower of Hanoi. You may use other creative text based displays. [20]

   Play Tower of Hanoi - https://www.mathsisfun.com/games/towerofhanoi.html

5. Zybooks exercises - Section 2.4, 2.5, 2.6, 2.8, 2.9, 2.14 .