COMPUTER PROGRAMMING

BATCH – A
[THURSDAY OCTOBER 05, 2017] DEADLINE: 6:30 PM

ASSIGNMENTS – 7 CODE: assign07

NOTES: You must use gcc compiler under Ubuntu OS

i) Please carefully read all assignment problems and answer in the same c file.
ii) Create a .c file by strictly following the file name convention: If your roll number is 41 & code is assign07, file name should be 041-assign07.c
iii) If you do not follow the above instruction, your file will not be evaluated

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PROBLEMS **[Total Marks: 20]**

1) **[Marks: 4]**
Write a C program to generate at least 10 matrices of size 3 (elements can be generated in [1, 99]) whose anti-diagonal elements are divisible by 3 but not 2. Also compute the trace (sum of elements on the main diagonal) of these matrices.

2) **[Marks: 6]**
Assume a matrix of size n where n is a random number in [7, 10].
Randomly generate integers (of 1- or 2-digits) as the elements of the matrix.
Now the task is to do the following: Find all sub-matrices of size 3 whose diagonal elements sum up to an odd number.

Print the original matrix, all sub-matrices of size 3 and their diagonal sum.

3) **[Marks: 6]**
Assume 5 names as given below:

X	i	a	n	g		W	u	\0							
R	a	y	m	o	n	d		C	h	o	w	\0			
A	d	r	i	a	n		G	r	o	z	a	r	i	a	\0
P	i	n	a	r		O	z	t	u	r	k	\0			
R	a	k	e	s	h		O	h	j	a	\0				

Each name has two parts: First name and the Second name.
Without using any string functions, perform lexicographic ordering of these names based on the second name. You can assume additional memory, if needed, but not an additional 2-Dimensional array.

4) **[Marks: 4]**
Create a list of 20 students records, each consists of the following columns:
Roll number (int), m1 (float), m2 (float), m3 (float), m4 (float), m5 (float), and avg (float). Assume that roll numbers are of 3 digits and m1, m2, m3, m4, and m5 are in the range [0.0, 100.0]. avg is the average of m1, m2, m3, m4, and m5.

a) Now populate the roll numbers, marks and compute the average of each student. Print the details as a formatted output (use %x.yd or %x.yf)

b) [BONUS] Re-order the record of each student based on his / her average marks in decreasing order (highest to lowest).