- Homework is due at the beginning of class.
- Turn in your programs and results (both nicely formatted).
- Staple multiple pages together.

1. In order to make better use of variable types and save memory, a scheme was devised to store logical states as bits of an *unsigned char*. Each bit corresponds to a reading from an automobile's sensors as defined below.

Bit	Sensor	0	1
7 (MSB)	driver's seat	no driver	driver seated
6	driver's seat belt	not fastened	fastened
5	passenger's seat	no passenger	passenger seated
4	passenger's seat belt	not fastened	fastened
3	doors	closed	open
2	air bag	not operational	operational
1	parking brake	not engaged	engaged
0 (LSB)	back up	no objects	objects present

   Write a C program that displays/prints the following:

   - "Seat Belt(s) Not Fastened" when a driver is seated without her/his seat belt fastened or a passenger is seated without her/his seat belt fastened;
   - "Not Safe to Drive" when doors are open, air bag isn't operational, parking brake is engaged, or objects are present behind the car; and
   - "All Systems OK" when OK to drive car, i.e., when above two conditions are not true.

   Test your program for the following four values assigned to a variable of type *unsigned char*: 0, 226, 244, 255.

2. Write a C program with a function declared/prototyped as *void printbin(unsigned char)* that prints the binary equivalent of the *unsigned char* passed to it. Test your program and function with the four hexadecimal values 0x00, 0x23, 0x9B, and 0xCF assigned in the *main ()* function and passed to the function.

3. Problem 7.2. Call your factorial function from within a loop in the *main ()* function. The loop should increment the input from 0 until the maximum integer for which we can compute/store its factorial. Print the numbers and their factorials, i.e., your columns will be n and $n!$.