

Engineering Models I Homework Assignment #1

Instructions:

1. **Show your work!**
2. It is fine to work with other students, but what you turn in must be your own work - not something copied from someone else.

Problem 1: Convert each of the decimal numbers to binary (unsigned integer). Do this by hand but you can use MATLAB (*dec2bin*) to check your answers. **Show your work!**

An Example of how to show work for this problem:

$$\begin{array}{cccccc} \underline{1} & \underline{0} & \underline{0} & \underline{1} & \underline{1} & \\ 16 & 8 & 4 & 2 & 1 & \end{array} \quad 19 = 16 + 2 + 1$$

- (a) 21
- (b) 123
- (c) 356

Problem 2: Convert each of the binary numbers (unsigned integers) to decimal. Do this by hand but you can use MATLAB (*bin2dec*) to check your answers. **Show your work!**

An Example of how to show work for this problem:

$$\begin{array}{cccccccc} 1 & 1 & 0 & 1 & 0 & 1 & 0 & 1 \\ 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \end{array} = 128 + 64 + 16 + 4 + 1 = 213$$

- (a) 1010 1101
- (b) 0110 1101 0010
- (c) 1011 0101 1101

Problem 3: Convert each of the binary numbers to hexadecimal.

- (a) 1011 0111
- (b) 0101 1111 1010
- (c) 0110 0001 1110
- (d) Why is Hex a useful system?

Problem 4:

- (a) What is the ASCII string for the word Computer in decimal?

- (b) What is the ASCII string for the word Computer in Hex?
- (c) Why is ASCII useful?

Problem 5:

- (a) Run the following two commands in MATLAB and record the output of each statement.

```
>> cos(pi/2)
>> cosd(90)
```

- (b) Why do you get two slightly different answers?

Problem 6: In MATLAB type the following two commands in order to learn about the two functions dec2hex and hex2dec:

```
>> help dec2hex
>> help hex2dec
```

- (a) Use MATLAB to convert the decimal number 13,465 to hex. Copy and paste your MATLAB command and the resulting output below.
- (b) Use MATLAB to convert the hex number 30FF to decimal. Copy and paste your MATLAB command and the resulting output below.