Computer Science	COMPSCI 210 S1 T 2007
	Assignment One – Version 1

The work done on this assignment must be your own work. Think carefully about any problems you come across, and try to solve them yourself before you ask anyone else for help. Under no circumstances should you work together with another student to solve problems posed in assignments. Note: You must show all your working steps; otherwise no mark will be given even if your answer is completely correct.

Assessment

Due: **4:00 pm 16 March 2007** (No Bonus/Penalty)
Worth: **3.33**% of your final mark

Questions

(1) Convert the following decimal numbers to 8-bit unsigned binary, octal and hexadecimal, showing your working:
a) 134_{10}
b) 99_{10}
[8 marks]
Answer: * MUST SHOW WORKING

Decimal	Binary	Octal	Hex
134	10 000 110	206	86
99	1 100 011	143	63

(2) Convert the following octal numbers to hexadecimal, showing all working:
a) 136_8
b) 531_8
[4 marks] *** MUST SHOW WORKING**

Octal	Binary	Hex
136	001 011 110	5E
531	101 011 001	159

(3) Perform the following binary addition
00110100 + 01000111
[2 marks]
Answer = 0111 1011 (* MUST SHOW WORKING)

(4) Perform the following binary subtraction
01101100 - 01011101
[2 marks]
Answer = 0000 1111 (* MUST SHOW WORKING)

(5) Perform the following binary multiplication
101 * 10
[3 marks]
Answer = 1010 (* MUST SHOW WORKING)

(6) Perform the following octal multiplication

231 * 312

[5 marks]

Answer = 74272 (* MUST SHOW WORKING)

(7) Perform the following hexadecimal division

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[5 marks]

Quotient = 27, Remainder = 2C (* MUST SHOW WORKING)

(8A) Convert 11110011 to decimal if the number is represented as:

i)   Unsigned 8-bit number,
ii)   Signed 8-bit Excess (biased),
iii)   Signed 8-bit two's complement.

[4 marks]

Unsigned = 243
Excess = 115
Two's complement = -13

(8B) Convert 00111101 to decimal if the number is represented as:

i)   Unsigned 8-bit number,
ii)   Signed 8-bit Excess (biased),
iii)   Signed 8-bit two's complement.

[4 marks]

Unsigned = 61
Excess = -67
Two's complement = 61

(9) Perform the following binary subtractions by adding the 2's complement of the subtrahend. Indicate the carry bits and indicate which binary subtraction result in an overflow:

a) 1010 1001 - 0010 0101
b) 1000 1100 - 0111 0110

 [8 marks]

a) Valid, Answer =10000100
b) Invalid answer = 00010110

(10) The following binary numbers are 8-bit binary signed values. What is the result of each calculation? Leave your answer in binary form.

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i)    01010110  & 11111011
ii)   01010110  | 11110101
iii)  01011011 << 2
iv)   10101011 >>> 2
v)    10101011 >> 3
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[5 marks]

i)   0101 0010
ii)   11110111
iii)   0110 1100
iv)   00101010
v)   11110101