Computer Science

COMPSCI 210 S1 T 2007

Assignment One – Version 4

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) 216_{10}
b) 83_{10}
[8 marks]

(2) Convert the following octal numbers to hexadecimal, showing all working:
a) 162_8
b) 377_8
[4 marks]

(3) Perform the following binary addition
01000011 + 01010101
[2 marks]

(4) Perform the following binary subtraction
00110110 - 00011001
[2 marks]

(5) Perform the following binary multiplication
101 * 101
[3 marks]

(6) Perform the following octal multiplication
126 * 512
[5 marks]

(7) Perform the following hexadecimal division
9B3 / 38
[5 marks]

(8A) Convert 10111011 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]

(8B) Convert 01101100 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]

(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]

(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)   10101001  & 11101010
ii)  10101001  | 11100101
iii) 01011111 << 3
iv)  10101111 >>> 1
v)   10101111 >> 2
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[5 marks]

Submission

Please use PEN to write your answer on A4 paper. You must make sure your marker can read your handwriting. Submit your assignment (with a cover sheet) to **Tamaki Student Resource Centre** before **4pm** on the due date.