1. [12 points] Convert the following decimal numbers to binary
   47.75 _______________________________
   5.875 _______________________________
   2.0625 _______________________________

2. [16 points] Convert the following decimal numbers to 8 bit twos complement binary

<table>
<thead>
<tr>
<th>Decimal</th>
<th>Binary</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>0100111</td>
</tr>
<tr>
<td>91</td>
<td>1011011</td>
</tr>
<tr>
<td>-15</td>
<td>1011111</td>
</tr>
<tr>
<td>-125</td>
<td>1100001</td>
</tr>
</tbody>
</table>

3. [12 points] Convert the following binary numbers to decimal
   11010.011 _______________________________
   100.001 _______________________________
   11011.01101 _______________________________

4. [12 points] Convert the following 8 bit twos complement binary numbers to decimal
   11011011 _______________________________
   01010101 _______________________________
   10101010 _______________________________

5. [12 points] The following 32 bit binary numbers represent a single precision floating point number. Give the decimal value for each number.
   01000010111101100000000000000000 _______________________________
   10111111100000000000000000000000 _______________________________

6. [16 points] Complete the following binary arithmetic of 8 bit twos complement numbers. Indicate if there is an overflow.
   01011101 + 0101111 _______________________________
   1011001 + 01101100 _______________________________
   10011101 + 11000011 _______________________________
   1111011 + 11111101 _______________________________
7. [5 points] Write the binary Gray Code numbers to count from 0 to 15.

8. [15 points] Write a program to:
   a) sum the single precision floating point numbers from 1.0 to 1000000.0
   b) sum the single precision floating point numbers from 1000000.0 down to 1.0
   Attach a copy of the source code.
   Why are the two answers not the same?