1) The following are two 12-bit two's complement numbers:

\[ A = 111111011010 \]
\[ B = 000010110101 \]

Compute \( A+B \) and \( A-B \) in two's complement.

2. Show the single precision floating point representation for \(-1.125\)

3. Translate the following assembly code fragment to (binary) machine code.

\[
\begin{align*}
\text{lui } & \quad $4 \quad 5 \\
\text{lw } & \quad $3, 125($13) \\
\text{add } & \quad $6, $4, $3 \\
\text{sw } & \quad $6, 125($13)
\end{align*}
\]

4. Draw a circuit that implements the following Boolean function: use one or two input gates only.

<table>
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<tr>
<th>A</th>
<th>B</th>
<th>C</th>
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5. Explain the difference between the two instructions:
   a. \( \text{j <address> } \)
   and
   \( \text{jal <address> } \)
6. Translate the following C code fragment to MIPS assembly.

```c
int i, sum;
int a[100], b[100];
...
sum = 0;
for (i:= 0, i < 100, i++)
    sum = sum + a[i]*a[i] - b[i] ;
```

Assume that the array `a` starts at location 0x110000000 and array `b` starts at 0x1100a0000