# Problem #1

**Max Root of the Tree:**

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**Min Level one of the Tree Root of the Tree:**

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# Problem #2

**Question: The pigeonhole principle says any function from pigeons into holes must result in two pigeons in the same hole. Let be a variable expressing that pigeon gets mapped to hole . Consider the case.**

**Express the following as propositional formulas:**

1. **Every gets mapped to some .**
2. **Some  is mapped to by  and  where .**

**The conjunction of these two statements is a propositional formula for . Convert  to clausal form and give a resolution refutation for this statement. Finally, trace the execution of DPLL on this formula.**

Part A:

Part B: