CSCI 2824-Spring 2014: Work sheet on induction.

 $\mathbf{P1}$ Let T_n be a recurrence defined as follows:

$$T_0 = 1, \ T_{n+1} = (n+1) + \frac{1}{2}T_n, \ n \in \mathbb{N}.$$

We wish to prove that $T_n \ge 2n+1$ for all $n \in \mathbb{N}$. **Proof:** Proof is by weak induction on n.

Base Case:

(Write down and verify base case)

Answer	
Ind. Hyp.	(Write down the statement of the ind. hyp.)
Answer -	,
Proof of Ind. Hyp.	(prove the ind. hyp.)
Answer	
P2 Let F_n , $n \ge 0$ be the Fibonacci series. The Proof: Proof is by weak induction on n . Base Case:	orem: For all $n \in \mathbb{N}, \sum_{j=0}^{n} F_j = F_{n+2} - 1.$ (Write down and verify base case)

Answer	
Ind. Hyp.	(Write down the statement of the ind. hyp.)

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Proof of Ind. Hyp.

(prove the ind. hyp.)

Answer	
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P3 Let F_n , $n \ge 0$ be the Fibonacci series.	
Theorem: For all $n \in \mathbb{N}$, If $n \ge 2$ then $F_n \ge 1.2^n$.	
Proof: Proof is by strong induction on n .	
Base Case:	(Write down and verify base case)
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Ind. Hyp.	(Write down the statement of the ind. hyp.)
Ind. Hyp.	(Write down the statement of the ind. hyp.)
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