Assignment 2

1.1 Use induction to prove $F_i = \frac{\phi^i - \hat{\phi}^i}{\sqrt{5}}$; where $F_i = F_{i-2} + F_{i-1}$, and ϕ is the golden ratio $\frac{1+\sqrt{5}}{2}$.

To prove by induction, write out the expressions f_n and f_{n+1}; f_{n+1} is the same as f_n, but with $(n+1)$ substituted everywhere in place of n. Next, if applicable, re-write the expression f_{n+1} to be in terms of f_n. To complete the algebra, perform manipulations on the expression until you reach some variation of $f_{n+1} = f_{n+1}$. Lastly, to complete the proof, show that the expression f_c also holds for some constant c.