1: var i   premiss

2: $\forall x.(P(x,x) \rightarrow P(x,j))$ premiss

3: $\neg P(i,j)$ premiss

4: | $\forall x.P(x,x)$ assumption

5: | $P(i,i)$ $\forall$ elim 4

6: | $P(i,i) \rightarrow P(i,j)$ $\forall$ elim 2

7: | $P(i,j)$ $\rightarrow$ elim 6,5

8: | $\bot$ $\neg$ elim 3,7

9: $\neg \forall x.P(x,x)$ $\neg$ intro 4-8