2-AIN-108 Computational Logic

Example 1 *Conceptualize in $\mathcal{ALC}$ and find out if the following knowledge base is consistent:*

Meet Jack. He's not a looser. He has a decent job, he works as office manager. Only that his boss is an idiot. But that does not bother Jack, because he earns well. He has a girlfriend, Jill. A good looking girl and smart too. They are not married yet though. Jack also has a car, a two seater Porsche with 6 cylinder engine. Damn that car is fast. What Ilike most about Jack is his dog, Killer. That dog is a purebred Yorkshire Terrier. It costed Jack $2000 to own this dog. Crazy thing these purebred dogs, they must have papers, and both parrents must be purebred as well.

$$
\begin{aligned}
\text{jack:} \quad & \neg\mathsf{Looser} \\
\langle\mathsf{jack}, \mathsf{job1}\rangle: \quad & \mathsf{hasJob} \\
\text{job1:} \quad & \mathsf{DecentJob} \sqcap \mathsf{OfficeManager} \\
\langle\mathsf{jack}, \mathsf{person1}\rangle: \quad & \mathsf{hasBoss} \\
\text{person1:} \quad & \mathsf{Idiot} \\
\text{jack:} \quad & \mathsf{EarnsWell} \\
\langle\mathsf{jack}, \mathsf{jill}\rangle: \quad & \mathsf{hasGirlfriend} \\
\text{jill:} \quad & \mathsf{GoodLooking} \\
\text{jill:} \quad & \mathsf{Smart} \\
\langle\mathsf{jack}, \mathsf{car1}\rangle: \quad & \mathsf{hasCar} \\
\text{car1:} \quad & \mathsf{Porsche} \sqcap \mathsf{2SeatCar} \sqcap \mathsf{6CylinderEngineCar} \sqcap \mathsf{FastCar} \\
\langle\mathsf{jack}, \mathsf{killer}\rangle: \quad & \mathsf{hasPat} \\
\text{killer:} \quad & \mathsf{PurebredDog} \sqcap \mathsf{YokshireTerrier} \sqcap \mathsf{Expensive}
\end{aligned}
$$

$$
\begin{aligned}
\mathsf{PurebreedDog} \quad \sqsubseteq \quad & \exists\mathsf{isRegisteredIn}.\mathsf{BreedRegistry} \sqcap \\
& \exists\mathsf{hasFather}.\mathsf{PurebredDog} \sqcap \\
& \exists\mathsf{hasMother}.\mathsf{PurebredDog}
\end{aligned}
$$