1a)
P(Smart, Study, Pass) = P(Pass|Smart,Study) * P(Study) * P(Smart)

1b)

Smart	Study	Pass	Probability
-smart	-study	pass	.0839
-smart	-study	-pass	.3359
-smart	study	pass	.1679
-smart	study	-pass	.1120
smart	-study	pass	.126
smart	-study	-pass	.054
smart	study	pass	.1139
smart	study	-pass	.006

1c)
P(Smart|Pass AND -Study) = (P(Pass AND -Study AND Smart))/(P(Pass AND -Study))
= 0.6

1d)
P(-Study|Smart AND -Pass) = (P(-Pass AND -Study AND Smart))/(P(-Pass AND Smart))
=0.9

1e)
P(Pass|Smart) = Σ P(Pass|Smart, Study) * P(Study)
=0.8

1f)
P(Pass|Study) = Σ P(Pass|Smart, Study) * P(Smart)
=0.705

2a)
P(Cold, Sneeze, Allergic, Scratches, Cat) = P(Sneeze|Cold,Allergic) * P(Cold) * P(Allergic|Cat) * P(Scratches|Cat) * P(Cat)

2b)
=P(Sneeze|-Cold,Allergic) * P(-Cold) * P(Allergic|Cat) * P(Scratches|Cat) * P(Cat)
=0.0049

2c)
=(P(-Cold,Sneeze,Allergic,Scratches,Cat))/(P(-Cold,Sneeze,Allergic,Scratches))
=0.754

2d)
=(P(Scratches|Cat) * P(Cat))/(P(Scratches))
P(Scratches) = P(Scratches|Cat) * P(Cat) + P(Scratches|-Cat) * P(-Cat)
=0.059

2e)
With 5 binary variables, we would need to compute 2^5=32 joint probabilities.

3a)
```
(:action start-car
 :parameters (?car)
 :precondition (and (at ?car)
                    (have-key)
                    (charged-battery ?car)
                    (has-gas ?car))
 :effect (and (running ?car)
              (at ?car)
              (have-key)))
```

3b)
Poss(Start(car),s) <-> At(car,s) AND HaveKey(s) AND ChargedBatter(car,s) AND HasGas(car,s)
Effects:
Running(car, do(Start(car),s))
At(car,do(Start(car),s)) AND HaveKey(do(Start(car),s))

3c)
∀c=car, HasGas(c,do(Start(car),s))↔HasGas(c,s)