

**Bayesian Models CSE458**  
**Exercise 1**

**Legal Problem**

*Pete is being sued by John. John is willing to accept an outer court settlement of \$35,000. It will cost Pete \$10,000 in legal fees to go court, and if she loses she will be required to pay \$100,000. On the otherhand if she wins, then she will only need to pay legal fees.*

1. Suppose the the lawyers believe Pete has only a 50/50 chance of winning. Using a Decision Flow Diagram, determine what Pete should do.
2. Determine the minimum probability of winning the case for which it will be worth going to court.
3. Suppose the lawyers tell Pete that if she got a QC to represent her, then she would have a 90% chance of winning the case. What would be the maximum amount that Pete should spend on legal fees to make it worth while to go to court with a 90% chance of winning?

**Oil Drilling Problem**

The following problem is based on a similar problem from “*Operation Research:applications and algorithms*”, by W. Winston.

*Oilco must determine whether or not to drill for oil in the South China Sea. It costs \$1,000,000 and if oil is found the value is estimated to be \$6,000,000. At present, Oilco believes there is a 45% chance that the field contains oil. Before drilling, Oilco can hire (for \$100,000) a geologist to obtain more information. There is a 50% chance that the geologist will issue a favorable report, and given a favourable report there is a 80% chance that the field contains oil. Given an unfavourable report there is only a 10% chance that the field will contain oil.*

1. Determine Oilco’s optimal course of action.
2. Determine EVSI and EVPI.