E: Value of information (VOI) analysis

Uncertainty analysis application:

- Determining the value of information
- Measured by willingness to pay (WTP)

Approach:

- Similar to previous analysis but use **X as the price** of information
- **Solve for maximum X** where it's worth buying information

Example:

Upgrading an emergency communications system

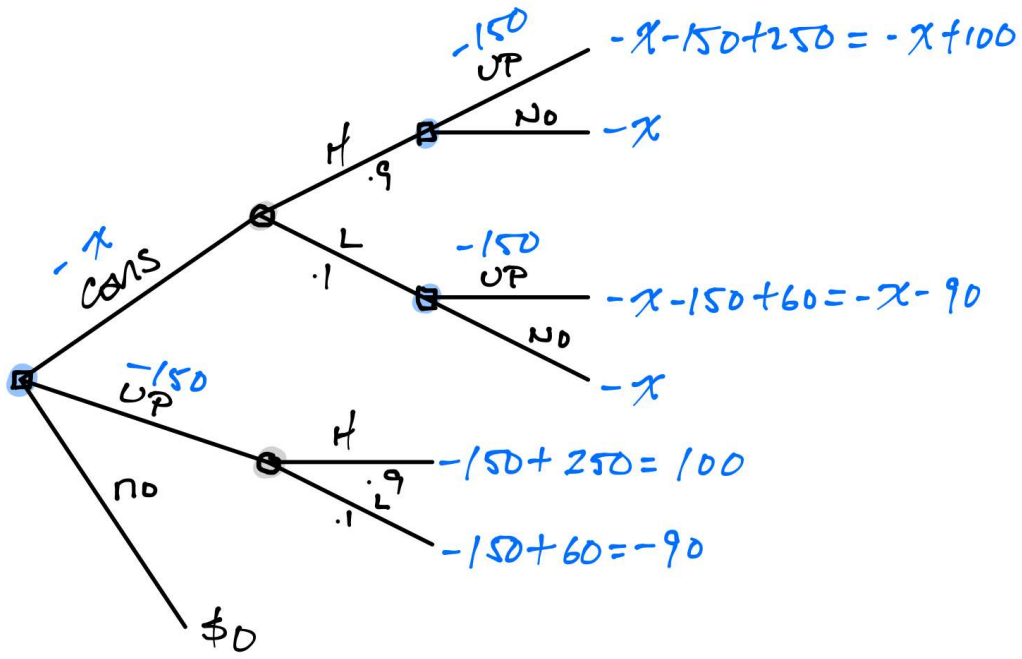
- Cost: $150 M
- Benefits:

State	Probability	Benefit
Works well, high payoff (H)	90%	$250M
Works poorly, low payoff (L)	10%	$60M

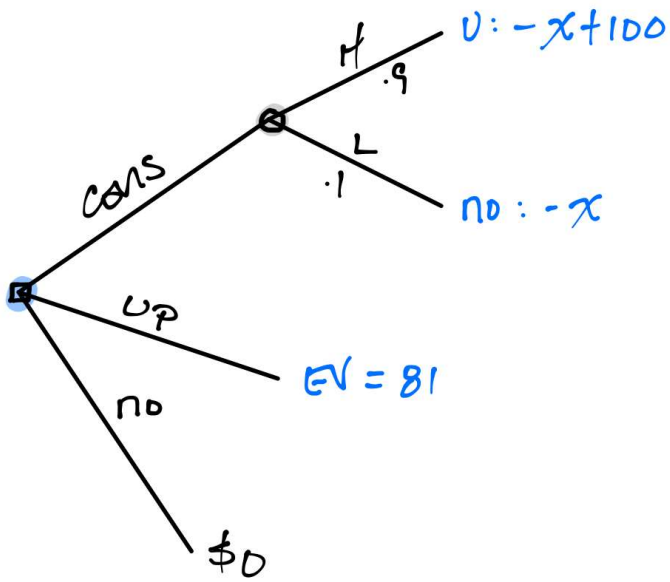
- Could hire consultant to determine state

Decision Tree:

Initial node: consultant, upgrade, or nothing

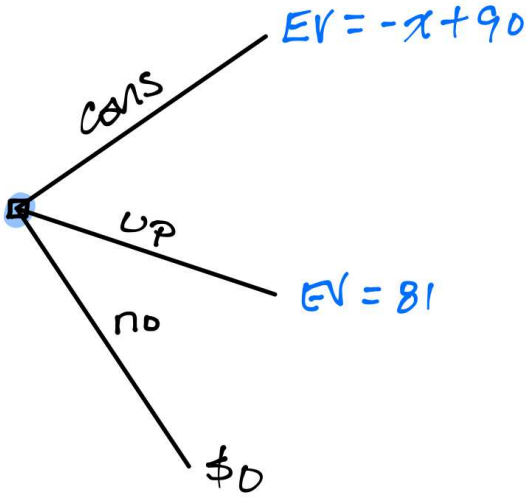


Simplifying the right nodes:



EV = 0.9*100 + 0.1*(-90) = 81

Simplifying again:



EV = 0.9*(-X+100) + 0.1*(-X)
EV = -X + 90

Buy information when:

$$-X + 90M \geq 81M$$

$$X \leq 9M$$

Conclusion:

- Maximum WTP for information is $9M

Exercise on GC