1. $P(Cloudy) = \langle 0.5, 0.5 \rangle$ *Given

2. $P(Sprinkler \mid cloudy) = \langle 0.1, 0.9 \rangle$ *Given

3. $P(Cloudy \mid sprinkler \wedge \neg raining) = \sum_{\alpha}(P(C) \cdot P(s \mid C) \cdot P(\neg r \mid C))$

$= [0.5 \cdot 0.1 \cdot 0.2, 0.5 \cdot 0.5 \cdot 0.8]$

$= [0.01, 0.2]$

$= \langle 0.048, 0.952 \rangle$

4. $P(WetGrass \mid cloudy \wedge sprinkler \wedge rain) = \sum_{WG}(P(WG \mid S \wedge r) \cdot P(S \mid C) \cdot P(r \mid c) \cdot P(C)$

$= \alpha P(S \mid C) \cdot P(r \mid C) \cdot P(c)[P(WG \mid S \wedge r), P(\neg WG \mid S \wedge r)]$

$= \alpha'[0.99, 0.01]$

$= \langle 0.99, 0.01 \rangle$

5. $P(Cloudy \mid \neg WetGrass) = \sum_{s,r} P(\neg WG \mid s, r) \cdot P(s \mid C) \cdot P(r \mid C) \cdot P(C)$

$= \alpha P(C)[P(\neg WG \mid s, r) \cdot P(s \mid C) \cdot P(r \mid C) + P(\neg WG \mid s, \neg r) \cdot P(s \mid C) \cdot P(\neg r \mid C) +$

$P(\neg WG \mid \neg s, r) \cdot P(\neg s \mid C) \cdot P(r \mid C) + P(\neg WG \mid \neg s, \neg r) \cdot P(\neg s \mid C) \cdot P(\neg r \mid C),$

$P(\neg WG \mid s, r) \cdot P(s \mid C) \cdot P(r \mid C) + P(\neg WG \mid s, \neg r) \cdot P(s \mid C) \cdot P(\neg r \mid C) +$

$P(\neg WG \mid \neg s, r) \cdot P(\neg s \mid \neg C) \cdot P(r \mid \neg C) + P(\neg WG \mid \neg s, \neg r) \cdot P(\neg s \mid \neg C) \cdot P(\neg r \mid \neg C),$

⇓ Plug & Chug

$\alpha[0.127, 0.226] = \langle 0.361, 0.639 \rangle$