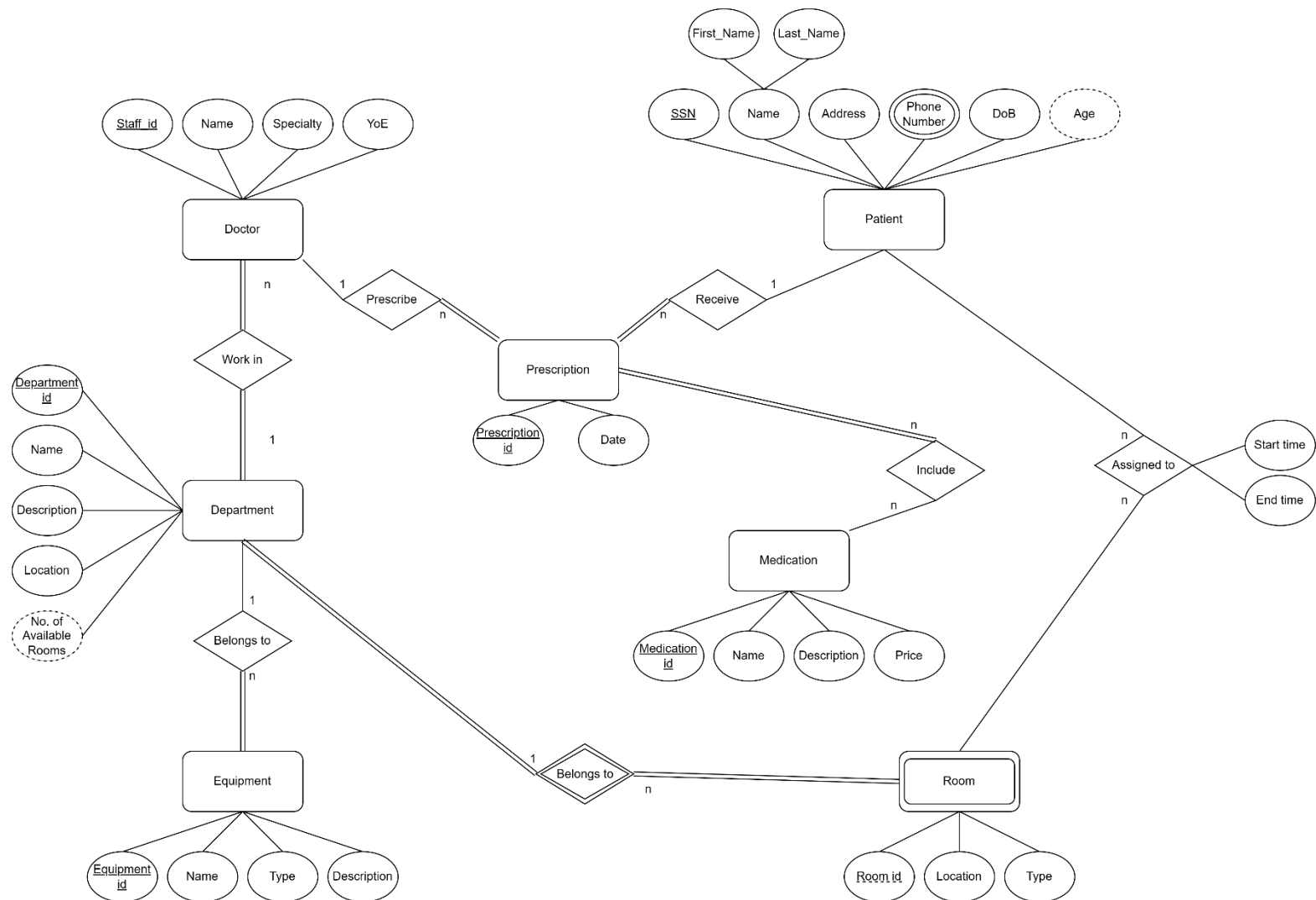


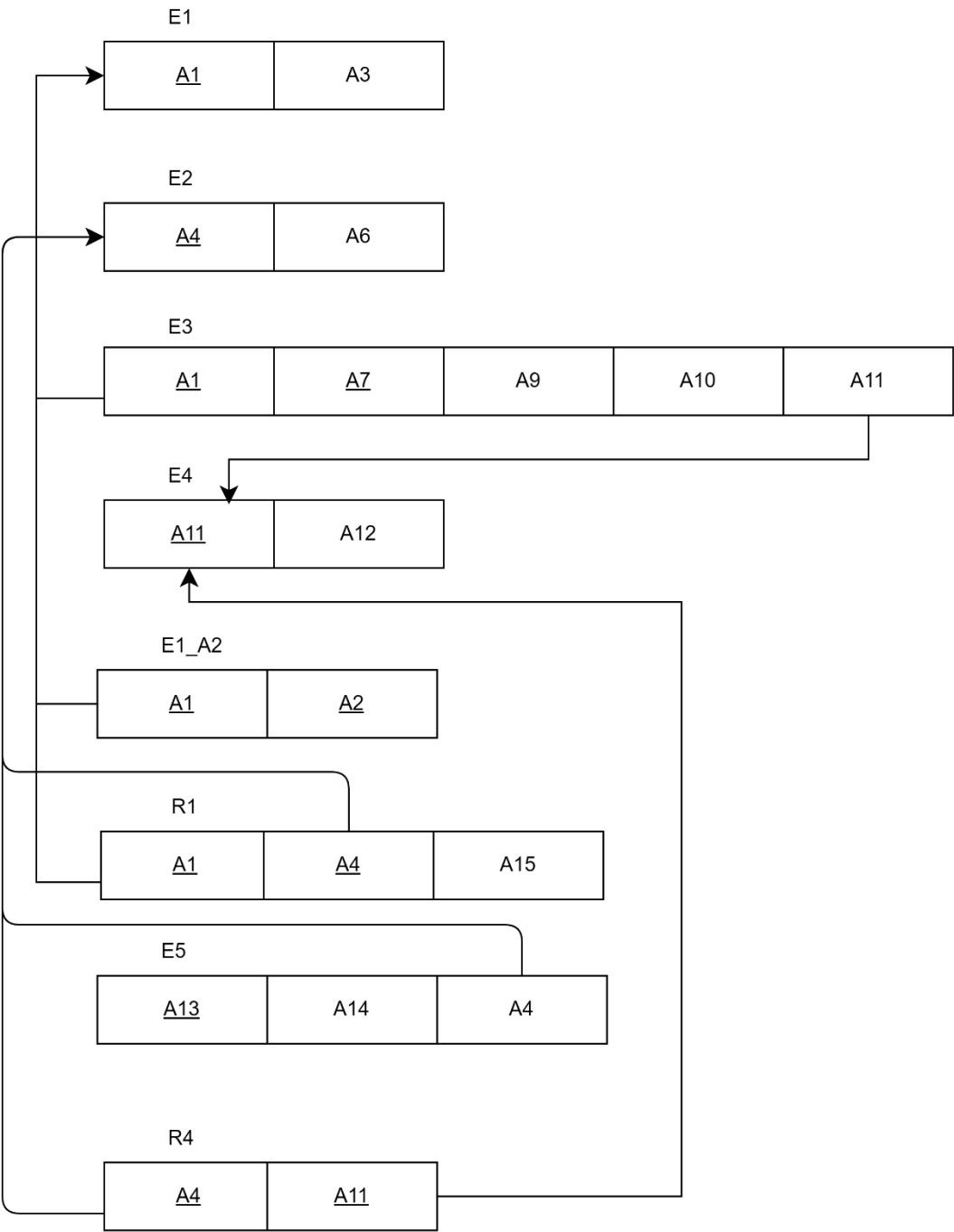
COMP9311 24T3 Assignment 1: Sample Answer

Note: the sample answer is not the only correct solution, other solutions may also be correct

Question 1



Question 2



Question 3

1.

$$R1 = \text{Sale} \bowtie \text{Customer} \bowtie \text{Car}$$

$$R2 = \gamma_{\text{cusID}, \text{SUM}(\text{salePrice})}(R1)$$

$$R3 = \pi_{\text{cusName}}(\sigma_{\text{SUM}(\text{salePrice}) > \text{AVG}(\text{SUM}(\text{salePrice}))} (R2 \times \gamma_{\text{AVG}(\text{SUM}(\text{salePrice}))}(R2)))$$

$$R4 = \gamma_{\text{cusID}, \text{COUNT}(\text{manuID})}(R1)$$

$$R5 = \pi_{\text{cusName}}(\sigma_{\text{COUNT}(\text{manuID}) > 2}(R4))$$

$$R3 \cap R5$$

2.

$$R1 = \pi_{\text{carID}}(\sigma_{\text{COUNT}(\text{serID}) > 1}(\gamma_{\text{carID}, \text{Year}, \text{COUNT}(\text{serID})}(\text{Service})))$$

$$R2 = \pi_{\text{carID}}(\sigma_{\text{rating} \leq 4.5}(\text{Salesperson} \bowtie \text{Sale}))$$

$$\pi_{\text{makName}}(\text{Manufacturer}) - \pi_{\text{makName}}((R1 \cup R2) \bowtie \text{Car} \bowtie \text{Manufacturer})$$

3.

$$R1 = \sigma_{\text{COUNT}(\text{saleYear}) = 2024 - \text{MIN}(\text{saleYear}) + 1}(\gamma_{\text{salpID}, \text{MIN}(\text{saleYear})}(\text{Sale}) \bowtie \gamma_{\text{salpID}, \text{COUNT}(\text{saleYear})}(\text{Sale}))$$

$$R2 = \pi_{\text{salpID}}(\sigma_{\text{salePrice} < \text{AVG}(\text{salePrice})}(\text{Sale} \bowtie \gamma_{\text{saleYear}, \text{AVG}(\text{salePrice})}(\text{Sale})))$$

$$\pi_{\text{salpName}}(\text{Salesperson} \bowtie (R1 - R2))$$

4.

$$R1 = \sigma_{\text{COUNT}(\text{serID}) = 1}(\gamma_{\text{carID}, \text{COUNT}(\text{serID})}(\text{Service}))$$

$$R2 = R1 \bowtie \text{Service} \bowtie \text{Sale}$$

$$\pi_{\text{carID}}(\sigma_{\text{Year} - \text{saleYear} \geq 3}(R2))$$