

Ansari Ahmad M

Enroll no:- 171283116002

College:- A.I.E

Subject:- AI

Assignment:- 1

* Convert following facts into predicate logic

- (1) Marcus was a man
- (2) Marcus was a pomeranian
- (3) All Pomeranians were Roman
- (4) Caesar was a ruler
- (5) All Romans were either loyal to Caesar or hated him.
- (6) Everyone is loyal to Someone.

(A) Marcus was a man

Ans:- Man (marcus)

This ^{relⁿ} captures the critical fact of marcus being a man in fact to capture some of the information in english sentence specially the 'past tense' But, this omission is acceptable.

(B) Marcus was a Pompeian

Ans:- Pompeian (marcus)

(C) All Pompeians were Romans

$$\forall x : \text{Pompeian}(x) \rightarrow \text{Roman}(x)$$

(D) Caesar was a ruler

$$\text{ruler}(\text{Caesar})$$

(E) All Romans were either loyal to Caesar or hated him.

$$\forall x : \text{Roman}(x) \rightarrow \text{loyal to}(x, \text{Caesar}) \vee \text{hate}(x, \text{Caesar})$$

(Above is inclusive OR)

* Exclusive OR:-

$$\forall x : \text{Roman}(x) \rightarrow \text{loyal to}(x, \text{Caesar}) \wedge \neg \text{hate}(x, \text{Caesar}) \vee (\neg \text{loyal to}(x, \text{Caesar}) \wedge \text{hate}(x, \text{Caesar}))$$

(f) Everyone is loyal to Someone

$\forall x : \exists y : \text{loyal to } (x, y)$