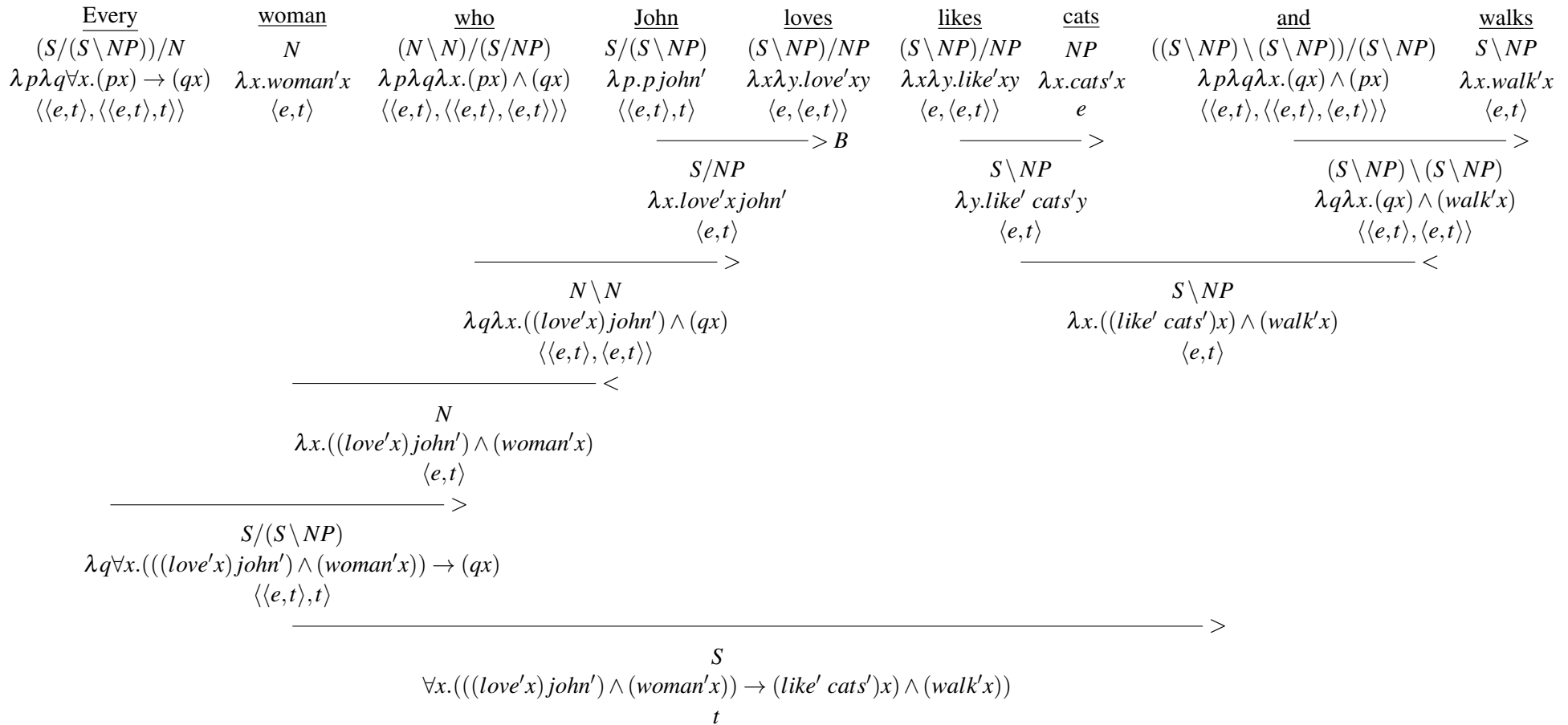


# COGS543 Assignment 3

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## Question 1:



## Question 2:

<u>Some</u> $(S/(S \setminus NP))/N$ $\lambda p \lambda q \exists x. (px) \wedge (qx)$ $\langle \langle e, t \rangle, \langle \langle e, t \rangle, t \rangle \rangle$	<u>woman</u> $N$ $\lambda x. \text{woman}'x$ $\langle e, t \rangle$	<u>who</u> $(N \setminus N)/(S/NP)$ $\lambda p \lambda q \lambda x. (px) \wedge (qx)$ $\langle \langle e, t \rangle, \langle \langle e, t \rangle, \langle e, t \rangle \rangle$	<u>John</u> $S/(S \setminus NP)$ $\lambda p. p \text{john}'$ $\langle \langle e, t \rangle, t \rangle$	<u>loves</u> $(S \setminus NP)/NP$ $\lambda x \lambda y. \text{love}'xy$ $\langle e, \langle e, t \rangle \rangle$	<u>and</u> $(X \setminus X)/X$ $\lambda p \lambda q \lambda r. (qr) \wedge (pr)$ $\langle \langle \langle e, t \rangle, t \rangle, \langle \langle \langle e, t \rangle, t \rangle, \langle \langle e, t \rangle, t \rangle \rangle \rangle$	<u>Mary</u> $S/(S \setminus NP)$ $\lambda q. q \text{mary}'$ $\langle \langle e, t \rangle, t \rangle$	<u>like</u> $(S \setminus NP)/NP$ $\lambda x \lambda y. \text{like}'xy$ $\langle e, \langle e, t \rangle \rangle$	<u>cats</u> $NP$ $\lambda x. \text{cats}'x$ $e$
			$\xrightarrow{\quad} B$		$\xrightarrow{\quad}$		$\xrightarrow{\quad}$	
			$S/NP$ $\lambda x. \text{love}'x \text{john}'$ $\langle e, t \rangle$		$(S/(S \setminus NP)) \setminus (S/(S \setminus NP))$ $\lambda q \lambda r. (qr) \wedge (\text{mary}'r)$ $\langle \langle e, t \rangle, t \rangle, \langle \langle e, t \rangle, t \rangle$		$S \setminus NP$ $\lambda y. \text{like}' \text{cats}'y$ $\langle e, t \rangle$	
			$\xrightarrow{\quad} >$					
		$N \setminus N$ $\lambda q \lambda x. ((\text{love}'x) \text{john}') \wedge (qx)$ $\langle \langle e, t \rangle, \langle e, t \rangle \rangle$						
		$\xrightarrow{\quad} <$						
	$N$ $\lambda x. ((\text{love}'x) \text{john}') \wedge (\text{woman}'x)$ $\langle e, t \rangle$							
	$\xrightarrow{\quad} >$							
	$S/(S \setminus NP)$ $\lambda q \exists x. (((\text{love}'x) \text{john}') \wedge (\text{woman}'x)) \wedge (qx)$ $\langle \langle e, t \rangle, t \rangle$							
								$\xrightarrow{\quad} <$
			$S/(S \setminus NP)$ $\lambda r. (\forall x. (((\text{love}'x) \text{john}') \wedge (\text{woman}'x)) \wedge (qx))r) \wedge (\text{mary}'r)$ $\langle \langle e, t \rangle, t \rangle$					
								$\xrightarrow{\quad} >$
						$S$ $(\forall x. (((\text{love}'x) \text{john}') \wedge (\text{woman}'x)) \wedge ((\text{like}' \text{cats}')x)) \wedge ((\text{like}' \text{cats}') \text{mary}')$ $t$		

$$\text{and} = ((S/(S \setminus NP)) \setminus (S/(S \setminus NP)))/(S/(S \setminus NP))$$