

ECE108 Assignment2

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1 Formalizing an Argument

1.1 Big Bang Theory

If the Big Bang Theory is correct then either there was a time before anything existed or the world will come to an end. The world will not come to an end. Therefore, if there was no time before anything existed, the Big Bang Theory is incorrect.

P : If the Big Bang Theory is correct

Q : there was a time before anything existed

R : the world will come to an end

$$P \implies (Q \vee R) \quad (1)$$

$$\neg R \quad (2)$$

$$\neg Q \implies \neg P \quad (3)$$

To win a gold medal, an athlete must be very fit. If s/he does not win a gold medal, then either s/he arrived late for the competition or his/her training was interrupted. If s/he is not very fit, s/he will blame his/her coach. If s/he blames his/her coach, or his/her training is interrupted, then s/he will not get into the competition. Therefore, if s/he gets into the competition, s/he will not have arrived late.

P : win a gold medal

Q : an athlete must be very fit

R : s/he arrived late for the competition

S : s/he arrived late for the competition

$$P \implies (Q \vee R) \quad (4)$$

$$\neg R \quad (5)$$

$$\neg Q \implies \neg P \quad (6)$$

- 2 Tautologies and Friends
- 3 Semantic Tableaux
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- 7 Generalized DeMorgan's Laws