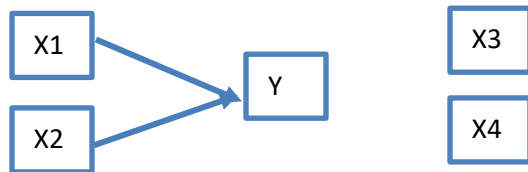


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### Question 4

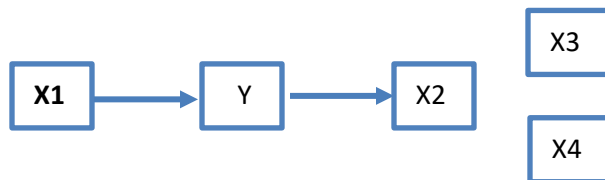
4.1 If  $X_1$  and  $X_2$  are significant predictors of  $Y$ ,  $X_3$  and  $X_4$  are not, and no interactions are significant; then what is the Markov Blanket for  $Y$ ? How is the concept of Markov Blanket related to multicollinearity?

$$X \in Mb(Y) \leftrightarrow Y \in Mb(X)$$



$X_1, X_2$  are parents in the Markov blanket of  $Y$

4.2 Suppose  $X_2$  occurs after  $Y$  and  $X_1$  occurs prior to  $Y$ , what is a Markov Blanket that separates variables that are irrelevant and could possibly be causes of  $Y$ ?



$X_1$  is the parent of  $Y$  and  $X_2$  is the child of  $Y$  and both are in the Markov blanket of  $Y$