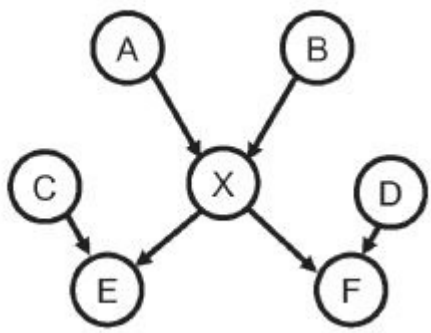
Assignment 8

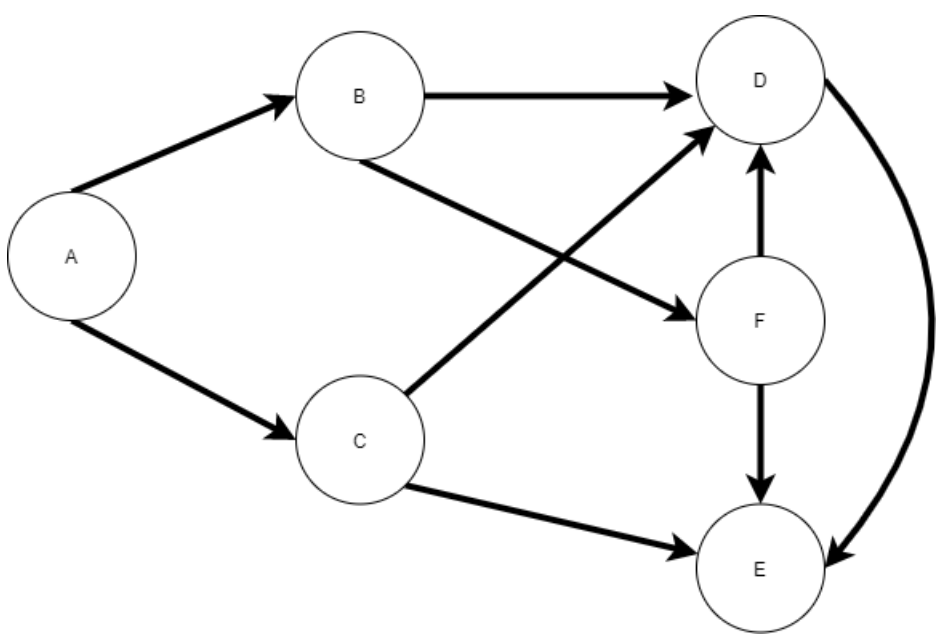
1 D-separation

Consider the DAG G in the following figure. Assume it is a minimal I-map for $p(A, B, C, D, E, F, X)$. Now consider marginalizing out X. That is, X is unobserved and we construct $p(A, B, C, D, E, F) = \sum_X p(A, B, C, D, E, F, X)$. Construct a new DAG G' which is a minimal I-map for $p(A, B, C, D, E, F)$. Specify (and justify) which extra edges need to be added.

Hint: Ensure that the new graph does not assert any conditional independence not asserted in the original graph. Does the original graph assert $E \perp F | A, B$ or $E \perp D | A, B, F$?



2 Converting BN to MRF



1. Convert the BN above to MRF.

Assignment 8

2. Fill in the blanks to make a true statement: _____ and _____ are d-separated given _____ in the BN, but not d-separated in the MRF.