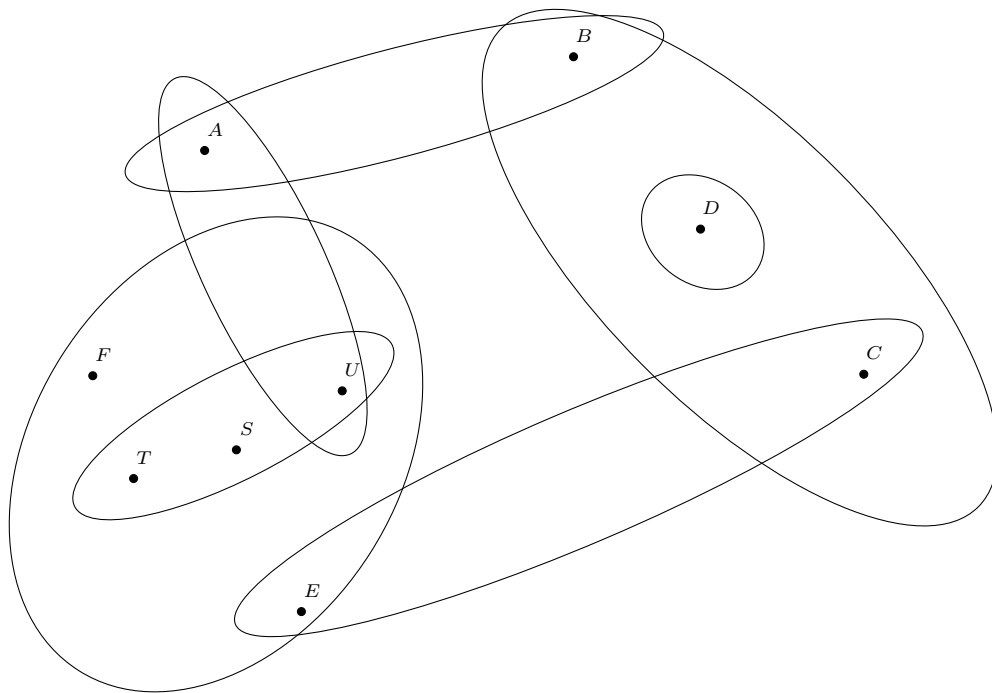


**Instructions:** Answer all the questions, working as any other homework problem

1.) Create a 3-regular, 3-uniform hypergraph. Is it possible to create an  $r$ -regular,  $k$ -uniform (simple) hypergraph when  $k \geq r$ ? Prove or disprove.

2.) Let  $H$  be the pictured hypergraph.



- (a) Create the associated bipartite graph to  $H$ .
- (b) What is the adjacency matrix of  $H$ ?
- (c) What is  $H^*$ ?