This homework assignment has 4 problems, for a total of 32 points.

1. (6 points) Identify all of the following statements that are true with reference to vector clocks and messaging
   A. We study vector clocks because commitments don’t make sense if we assume synchronous messaging
   B. Vector clocks are essential for synchronous messaging
   C. Vector clocks can be used for synchronous messaging provided that when a message is sent, you set the sender and receiver of a message to have the same vector clocks

2. (10 points) Which of the following statements are true about interaction and communication?
   A. Agents must be aware of their interactions: thus if an agent silently consumes a resource that another one could have used, then there is no interaction between them
   B. Two agents can be said to be communicating only if when one agent sends the other agent a message, the other replies
   C. Perlocution refers to the effects a communication has on its receiver
   D. In computational settings, the type of illocution a communication is can be captured as its message type
   E. Statements such as Shut the door! become true when the door in question is shut

3. (10 points) Identify all of the following statements that are true about commitments and commitment protocols
   A. The release of a commitment means it is dissolved
   B. If a commitment is delegated to a new debtor, the new debtor cannot delegate it further
   C. An agent may do what its commitment requires even after the commitment has been released
   D. Escrow is an example of a protocol that could be recast as a commitment protocol
   E. Creating a commitment protocol representation forces us to think of the meanings of the messages involved

4. (6 points) Which of the following statements are true about service selection?
   A. Unlike service discovery, service selection is equally difficult in open and in closed environments
   B. In general, the better you are at discovery the bigger the problem you face for selection
   C. In ontology terms, a service can fulfill a need if its input and output classes respectively subsume the input and classes of the needed service