1. ***What are some major data mining methods and algorithms***

   Generally speaking, data mining tasks can be classified into three main categories: prediction, association, and clustering. Based on the way in which the patterns are extracted from the historical data, the learning algorithms of data mining methods can be classified as either supervised or unsupervised. With supervised learning algorithms, the training data includes both the descriptive attributes (i.e., independent variables or decision variables) as well as the class attribute (i.e., output variable or result variable). In contrast, with unsupervised learning the training data includes only the descriptive attributes.

2. **Give examples of situations in which classification would be an appropriate data mining technique. Give examples of situations in which regression would be an appropriate data mining technique.**

   Students' answers will differ, but should be based on the following issues. Classification is for prediction that can be based on historical data and relationships, such as predicting the weather, product demand, or a student's success in a university. If what is being predicted is a class label (e.g., "sunny," "rainy," or "cloudy") the prediction problem is called a classification, whereas if it is a numeric value (e.g., temperature such as 68°F), the prediction problem is called a regression.

3. ***What is the major difference between cluster analysis and classification***

   Classification methods learn from previous examples containing inputs and the resulting class labels, and once properly trained they are able to classify future cases. Clustering partitions pattern records into natural segments or clusters.