1. Define the relation `mergesort(L1,L2,L3)` where `L1` and `L2` are two unsorted lists and `L3` is the sorted list. You may define some relations as necessary to support `mergesort` relation. For example, a question may be as follow: 
   `- mergesort([3,1,8,7,5],[4,6,9,2],L).
   Answer as
   L = [1,2,3,4,5,6,7,8,9];
   no.

2. Define a Prolog predicate `print_splits`, which when given a string, will print out all possible ways of dividing the string in two, like this: 
   `- print_splits('university').
   university
   un iversity
   uni versity
   univ ersity
   unive rsity
   univers ity
   universi ty
   universit y
   university

3. Three missionaries and three cannibals must cross a river, but the only available boat will hold only two people at a time. There is no bridge, the river cannot be swum, and the boat cannot cross the river without someone in it. The cannibals will eat any missionaries they outnumber on either side of the bank. Write a Prolog program to get everyone across the river with all of the missionaries uneaten. (You need to explain your algorithm with comments for all defined predicates, example question, and its expected solution).

Note In your programs, write comments in appropriate places especially question to ask for performing the goal. Grading will be measured on facts, rules, output, comments, etc...