For lab 4 you implemented functions to retrieve word embeddings based on search trees. For this lab you will add two more implementations to solve the same problem, one using hash tables with chaining and another using hash tables with linear probing. Your program should offer the same functionality as lab 4; you must also do the following:

1. Implement and compare the following hash functions, where \( n \) is the length of the table:
   - The length of the string \( \% n \)
   - The ascii value (ord(c)) of the first character in the string \( \% n \)
   - The product of the ascii values of the first and last characters in the string \( \% n \)
   - The sum of the ascii values of the characters in the string \( \% n \)
   - The recursive formulation \( h(\”,n) = 1; h(S,n) = (ord(s[0]) + 255*h(s[1:],n))\% n \)
   - Another function of your choice

2. Compare the best results obtained with hash tables with the best results obtained with trees. Which implementation is faster?

As usual, write a report describing your work. Discuss the efficiency of the methods and the effects of the choice of hash function.