Homework 4 (due 5/8)

1. (100 pts.) Write a C++ program to solve **word search puzzles** using a **hash table**. A word search puzzle is an $N \times M$ arrays of upper-case letters, and the objective is to locate and output all dictionary words that appear in this grid horizontally, vertically, or diagonally and either forwards or backwards (but no wrap-arounds).

   For example, given the following input,

   ```
   R D Z I T P M F
   T E K A N S T D
   T I B B A R O O
   K E L A H W A A
   C J I E P N D K
   S D E O E M Z I
   H Z I Y L A T X
   I S H H E E L S
   ```

   the output should include the following, among others,:

   ```
   BIT at (3, 3) to (3, 1)
   EEL at (8, 5) to (8, 8)
   TILE at (2, 1) to (5, 4)
   AID at (4, 4) to (6, 2)
   TOAD at (2, 7) to (5, 7)
   ...
   ```

Your code must

1. be able to handle puzzles of arbitrary dimensions;
2. use the dictionary `word.txt` provided on this web site;
3. use a hash table to search the dictionary;
4. sort the output list of words along with their starting and ending positions alphabetically.

You must turn in by noon of the due date:

- a hard copy of your code with sample output, your name, and your section; and
- send **one** email message with the subject line: `HW4 Your_last_name Your_section` to `cs61@math.scu.edu` with your code attached. Please do **not** zip your file.