Due October 22, 11PM.

You are to write a C (or C++) program to determine the distance from START to FINISH in a maze. The maze is on an \(m \times n\) grid (where \(m, n \leq 1024\)). Some grid points are walls, which are represented by a '1'. The other grid points are open space that can be moved onto, which are represented by a '0'. Distance is measured by moving one grid space north, south, east, or west. But you are not allowed to move into (or through) a wall. You can assume there is a path from START to FINISH.

**INPUT:**

- **SIZE:** Positive integers \(m, n\).
- **MAZE:** An \(m \times n\) table of bits, where a '1' represents wall and a '0' represents open space. Each row will start on a new line. The bits will be stored in base 10 unsigned numbers. The first number in a row will represent the first 32 bits of the row, the second number will represent the second 32 bits, etc. You can assume \(32n\) words. 
- **START:** An \(m \times n\) table of bits, where a '1' represents the start location and all other bits are '0'. It is represented the same way as MAZE.
- **FINISH:** An \(m \times n\) table of bits, where a '1' represents the finish location and all other bits are '0'. It is represented the same way as MAZE.

(MAZE, START, and FINISH should each use \(mn/32\) words of memory.)

**ALGORITHM:**

1. \{Produce the complement of MAZE; this is the OPEN space that can be moved onto.\}
   \text{OPEN} \leftarrow \text{not MAZE}.
2. \text{NOW} \leftarrow \text{START}; \quad \text{COUNTER} \leftarrow 0;
3. \{Check if arrived at FINISH.\}
   \text{If NOW} \& \text{FINISH} \neq 0 \text{ then print COUNTER and exit;}
4. Increment COUNTER;
5. \{Find new locations you can reach: For every '1' bit in NOW copy it north, south, east, and west into NEW\_NOW. Do this using bit operations on words. Be careful about crossing word boundaries east and west.\}
6. \{Make sure you do not walk into a wall.\}
   \text{NOW} \leftarrow \text{NEW\_NOW} \& \text{OPEN};
7. Go to step 3;

Sample input files will be provided in the posting account directory ss311001/Projects/P1.