# #4.1

- 1. Local beam search with k = 1 is steepest hill climbing search
- 2. Local beam search with one initial state and no limit on the number of states retained is breadth first search
- 3. Simulated annealing with T = 0 at all times means stochastic hill climbing since the next state is generated randomly and no bad move is accepted
- 4. Genetic algorithm with population size N = 1 is random walk, since we can only keep one state, selection and crossover will not change anything, only mutation will change the state, which is done so in a random way.

# #6.1 Crossword Puzzle

- As a general search problem:
  - States: empty puzzle
  - Actions: pick a word from the word list and fill out the puzzle
  - Transition model: puzzle being filled with the selected word
  - Goal: Puzzle solved with no conflict
  - Step cost: 1 for each action

# #6.1 Crossword Puzzle

- As a CSP (word):
  - Variable: a list of empty cells in the puzzle
  - Domain: a list of words provided
  - Constraints: selected words will fill out the cells with no conflicts

- As a CSP (letters):
  - Variable: a list of empty cells in the puzzle
  - Domain: alphabet
  - Constraints: selected letters form a word in the list

# #6.2 Class Scheduling

- Variables: Classes
- Domain: list of classes from the curriculum, list of faculty members, list of time modules, list of classrooms
- Constraints:
  - Each class is assigned to a professor with a valid time module and classroom.
  - A professor has no time conflict in his/her schedule.
  - A room cannot be scheduled with time conflicts.
  - Etc.

# #6.3 (wrong)

- One possible trace:
  - {WA→NT}, delete R from NT
  - {WA→SA}, delete R from SA
  - {V-->SA], delete B from SA
  - {SA-->NT}, delete G from NT
  - {SA→Q}, delete G from Q
  - {NT→Q}, delete B from Q
  - {SA→NSW}, delete G from NSW
  - {Q→NSW}, delete R from NSW
  - {V→NSW}, delete B from NSW, now NSW is left with no color.