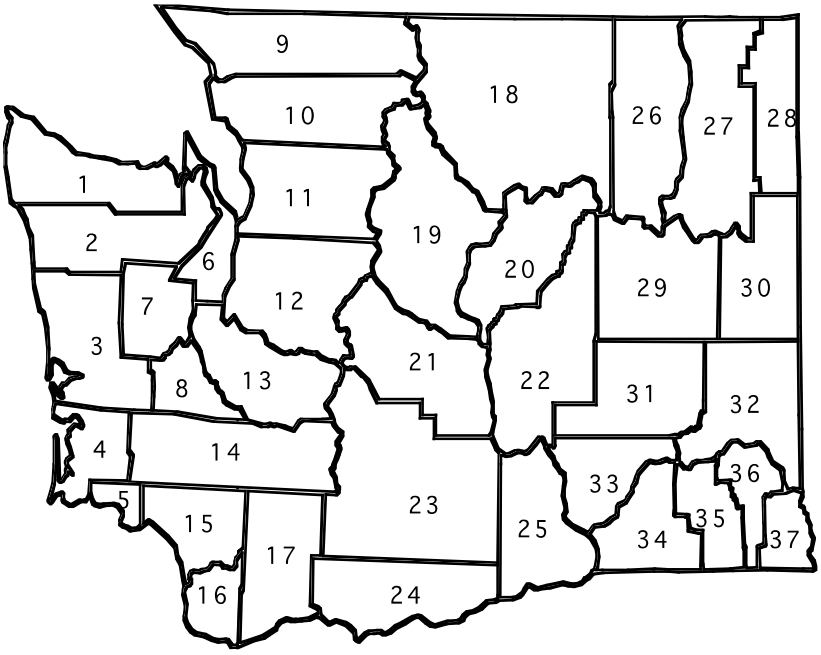
Homework 6

The following two problems are from Hillier, Introduction to Management Science:

1. The Washington State legislature is trying to decide on locations at which to base search-and-rescue teams. The teams are expensive, so the legislature would like as few as possible while still providing the desired level of service. Since response time is critical, the legislature would like every county to either have a team located in that county or in an adjacent county.

Locating Search and Rescue Teams



Counties

1. Clallum
2. Jefferson
3. Grays Harbor
4. Pacific
5. Wahkiakum
6. Kitsap
7. Mason
8. Thurston
9. Whatcom
10. Skagit
11. Snohomish
12. King
13. Pierce
14. Lewis
15. Cowlitz
16. Clark
17. Skamania
18. Okanogan
19. Chelan
20. Douglas
21. Kittitas
22. Grant
23. Yakima
24. Klickitat
25. Benton
26. Ferry
27. Stevens
28. Pend Oreille
29. Lincoln
30. Spokane
31. Adams
32. Whitman
33. Franklin
34. Walla Walla
35. Columbia
36. Garfield
37. Asotin

It would take you over an hour to "graph" and spreadsheet the 37 counties of Washington. So open "Homework 6" Excel sheet on Canvas and see the massive 37x37 county touching spreadsheet.

Determine where the teams should be located. There are multiple optimal solutions to this problem, though only one optimal value. I want to know the minimal number of search and rescue teams needed, and then just show me your spreadsheet model and I'll see which counties they are in. Note if you are having issues, guessing at an initial solution can be helpful: obviously county 2 (Jefferson) will need a team as that team will be able to serve counties 1, 2, 3, 6, and 7.

2. B&N sells books. Management is trying to determine the best sites for the company's warehouses. The five potential sites under consideration are listed in the first column in the spreadsheet. Also shown are the average weekly demand from each region of the country, the average shipping cost from each warehouse site to each region of the county, the fixed cost per week of each warehouse *if* it is operated, and the maximum capacity of each warehouse (if it is operated). Determine which warehouse sites B&N should operate and how books should be distributed from each warehouse to each region of the country to minimize cost.