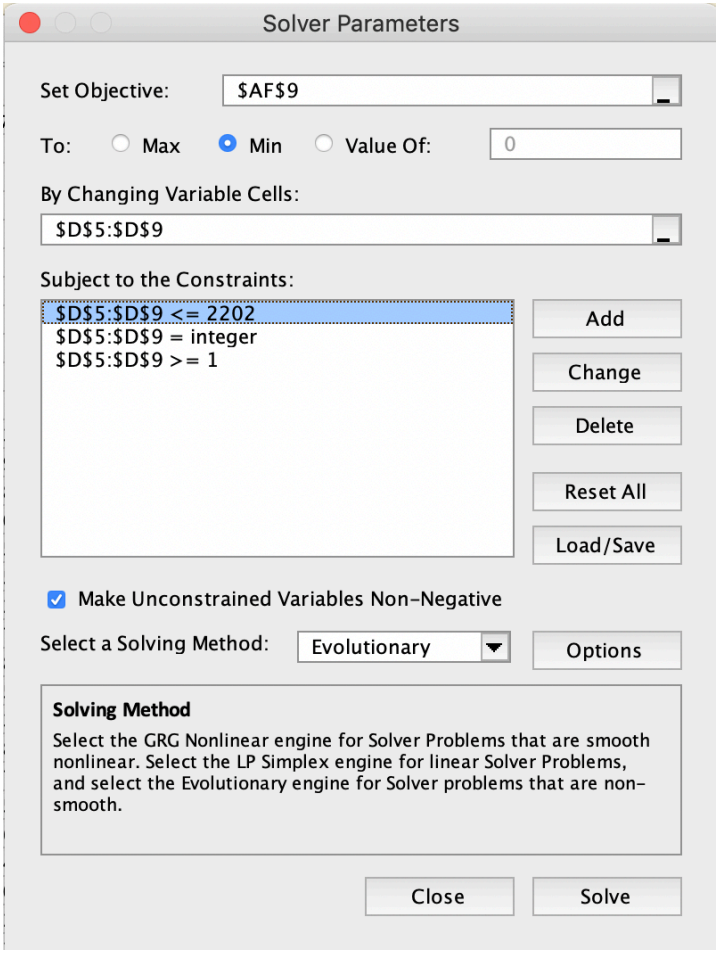
Step by Step Description

1. Organizing factors in columns B to O
2. Choosing clusters
    - Compute average value of column E in E1 with formula =AVERAGE(E12:E2213)
    - Compute the standard deviation of E in E2 with formula =STDEV(E12:E2213)
    - Copy these formulas to F1:O2 to compute the mean and standard deviation for the rest of the factors
    - In P12, compute the standardized median parent household income (the z-score) with the formula =STANDARDIZE(E12,E$1,E$2)
    - Copy this formula from Q12 to Z2213 to compute z-scores for all neighborhoods
3. Setting up the Solver model for cluster analysis
    - Enter trial values (integers between 1 to 2202) in D5:D9 for cluster anchors
    - Set C5:C9 as school names that the trial values represent. In C5, look up neighborhood name of the first cluster anchor with formula =VLOOKUP($D5,$A$11:$Z$2213,2)
    - Copy this formula to C6:C9 to identify the names of the four other schools
    - Identify the z-score for median parent household income in the first chosen school using the formula =VLOOKUP($D5,$A$11:$Z$2213,16)
    - Identify the z-scores for each of the five selected neighborhoods by copying this formula from E5 to E5:O9
4. Computing the squared distance
    - Compute the squared distance from each school to each of the five selected cluster candidates
        - Compute the distance from each school to the first cluster candidate using the formula =SUMXMY2($E$5:$O$5,P12:Z12) in AA12 and copy this formula to AA12:AA2213
        - Compute the distance from each school to the second cluster candidate using the formula =SUMXMY2($E$6:$O$6,P12:Z12) in AB12 and copy this formula to AB12:AB2213
        - Compute the distance from each school to the third cluster candidate using the formula =SUMXMY2($E$7:$O$7,P12:Z12) in AC12 and copy this formula to AC12:AC2213
        - Compute the distance from each school to the fourth cluster candidate using the formula =SUMXMY2($E$8:$O$8,P12:Z12) in AD12 and copy this formula to AD12:AD2213
        - Compute the distance from each school to the fifth cluster candidate using the formula =SUMXMY2($E$9:$O$9,P12:Z12) in AE12 and copy this formula to AE12:AE2213
    - Compute the smallest distance from each city to the four cluster anchor by using the formula =MIN(AA12:AE12) in cell AF12 and copying it to AF12:AF2213
    - Compute the sum of squared distances of all cities using formula = SUM(AF12:AF2213) in AF9
    - Name column AH “assigned to,” determine which cluster each school is assigned to by using formula =MATCH(AF12,AA12:AE12,0) in AH12, and copy this formula to AH12:AH2213

5. Using the Solver window to find the optimal cluster anchors for the four clusters as shown below



6. Rearranging data
    - Create a separate sheet named “Sorted” with the same data we have and sort the “Assigned to” column from small to large
    - Color code the different categories we sorted out