Social Network Analysis - MicroFinance

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Regression on the Centrality measures of village leaders

This report outlines the impact of centrality metrics on the adoption of a **micro-finance** scheme in 75 villages in India.

From the summary output below, it can be observed that the model has $MultipleR-squared = 0.3314$. This suggests that the model does not explain most of the variance in the response variable `mf` , and it explains only ***33%*** of the variance in the micro finance scheme adoption variable.

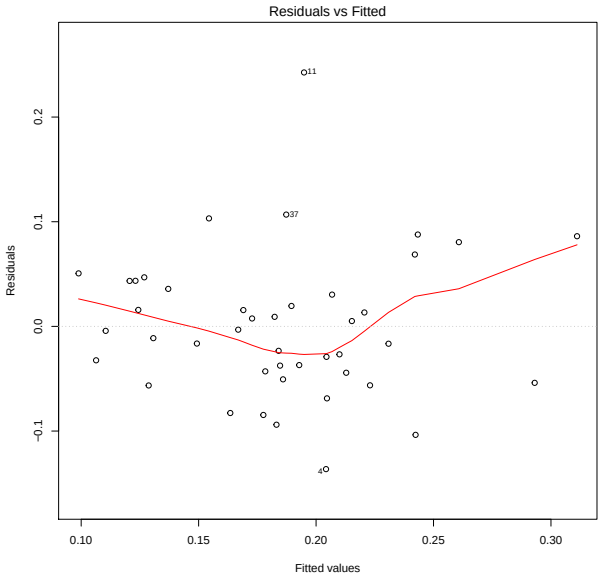
We can observe from the p-values and the QQ-Plot that `numHH` (number of households) has the only significant impact which is very minute and negative in nature. The variables `fractionLeaders` (fraction of population that are villagers), `degree_leader` (degree measure of the leaders) and `closeness_centrality_leader` (closeness measure of the leaders) all have a negative impact as well, but they are statistically insignificant. The variable `between_centrality_leader` (betweeness measure of the leaders) has a huge but statistically insignificant positive impact (even though the QQ-plot suggests a correlation) while `eigenvector_centrality_leader` (eigen vector centrality measure of leaders) has a small positive impact on `mf` but it is also statistically insignificant.

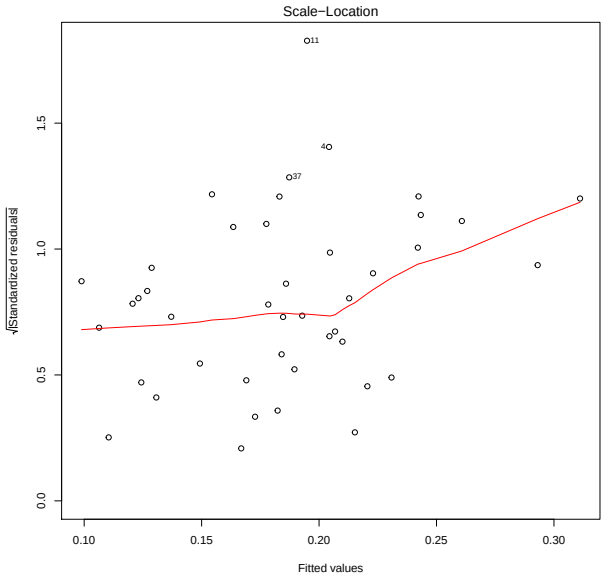
In summary, based on the qq-plots and p-values from the summary statistics, we conclude that only ***number of households*** has a statistically significant affect but it is very miniscule. In this model, the role of the leader is not statistically significant.

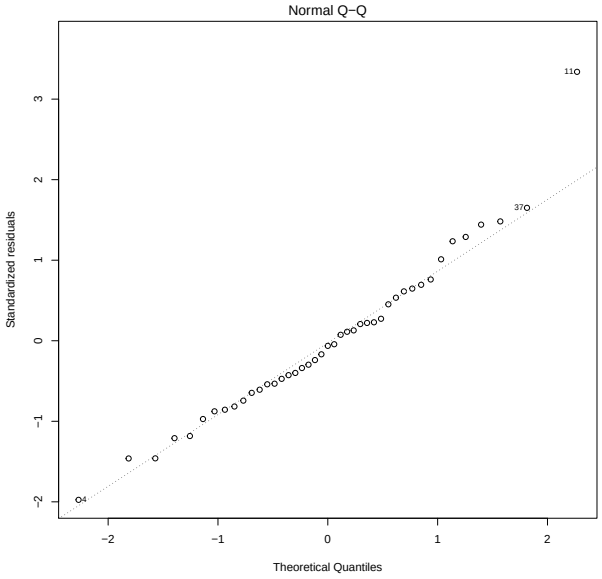
```
summary(results)
```

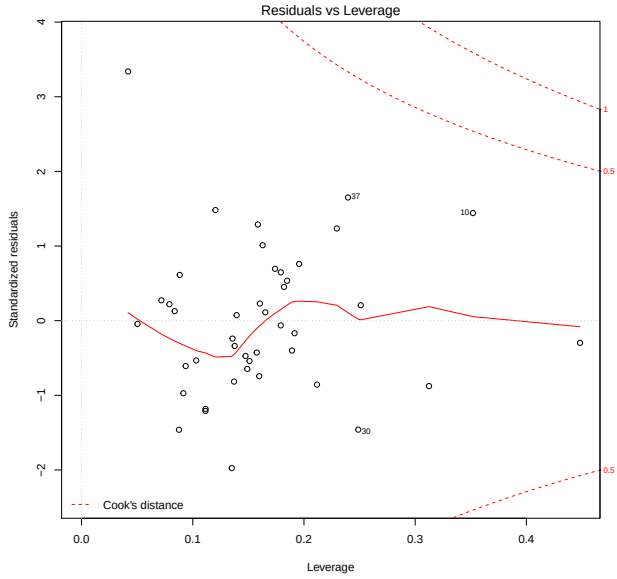
```
##
## Call:
## lm(formula = mf ~ . - village, data = microFinance)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.13637 -0.04363 -0.00427  0.03964  0.24262
##
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                   0.296975   0.158217   1.877   0.0686 .
## numHH                        -0.000716   0.000350  -2.046   0.0481 *
## fractionLeaders              -0.012408   0.395898  -0.031   0.9752
## degree_leader                -0.979266   1.294128  -0.757   0.4542
## between_centrality_leader     6.210669   3.937754   1.577   0.1235
## closeness_centrality_leader  -0.200685   0.283705  -0.707   0.4839
## eigenvector_centrality_leader  0.146715   0.208247   0.705   0.4856
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.07423 on 36 degrees of freedom
## Multiple R-squared:  0.3314, Adjusted R-squared:  0.2199
## F-statistic: 2.974 on 6 and 36 DF,  p-value: 0.01836
```

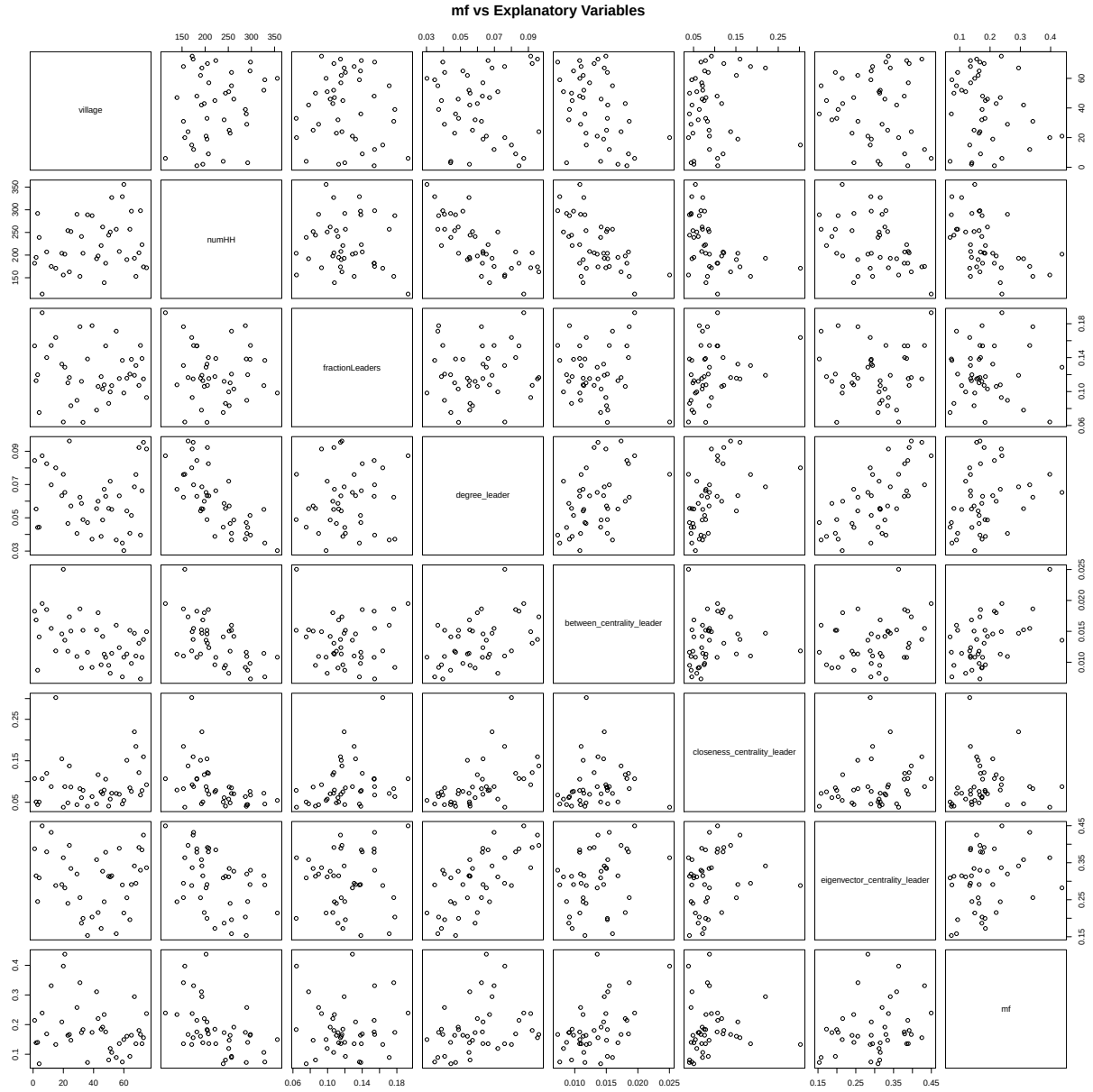
$$results = lm(mf\ . - village, data = microFinance)$$











Clearly there is no **strong** *correlation between* `mf` *and the explanatory variables.*