

Lab4__RMD__Layer2

Kim Vignola

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Add libraries

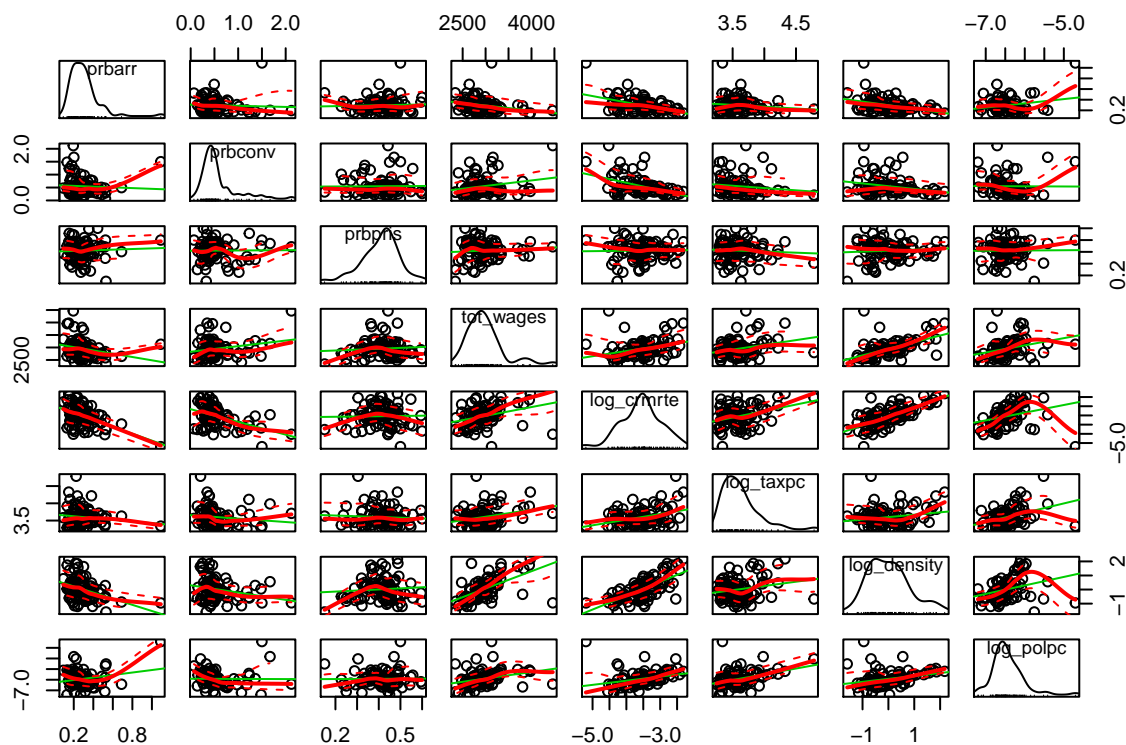
```
library(car)
library(corrplot)
```

variables created.

```
crime$tot_wages <- (crime$wcon + crime$wtuc + crime$wtrd + crime$wfir + crime$wser + crime$wmfg + crime$wloc)
crime$gov_wages <- (crime$wfed + crime$wsta + crime$wloc)
crime$bus_wages <- (crime$wcon + crime$wtuc + crime$wtrd + crime$wfir + crime$wser + crime$wmfg)
crime$low_wages <- as.numeric(crime$tot_wages < mean(crime$tot_wages))
crime$high_wages <- as.numeric(crime$tot_wages > mean(crime$tot_wages))
crime$wcon_p <- crime$wcon/crime$tot_wages
crime$wtuc_p <- crime$wtuc/crime$tot_wages
crime$wtrd_p <- crime$wtrd/crime$tot_wages
crime$wfir_p <- crime$wfir/crime$tot_wages
crime$wser_p <- crime$wser/crime$tot_wages
crime$wmfg_p <- crime$wmfg/crime$tot_wages
crime$wfed_p <- crime$wfed/crime$tot_wages
crime$wsta_p <- crime$wsta/crime$tot_wages
crime$wloc_p <- crime$wloc/crime$tot_wages
crime$bus_wage_p <- crime$wcon_p + crime$wtuc_p + crime$wtrd_p + crime$wfir_p + crime$wser_p + crime$wmfg_p
crime$govt_wage_p <- crime$wfed_p + crime$wsta_p + crime$wloc_p
crime$sta_loc_p <- crime$wsta_p + crime$wloc_p
crime$log_crmrte <- log(crime$crmrte)
crime$log_taxpc <- log(crime$taxpc)
crime$log_density <- log(crime$density)
crime$log_polpc <- log(crime$polpc)
```

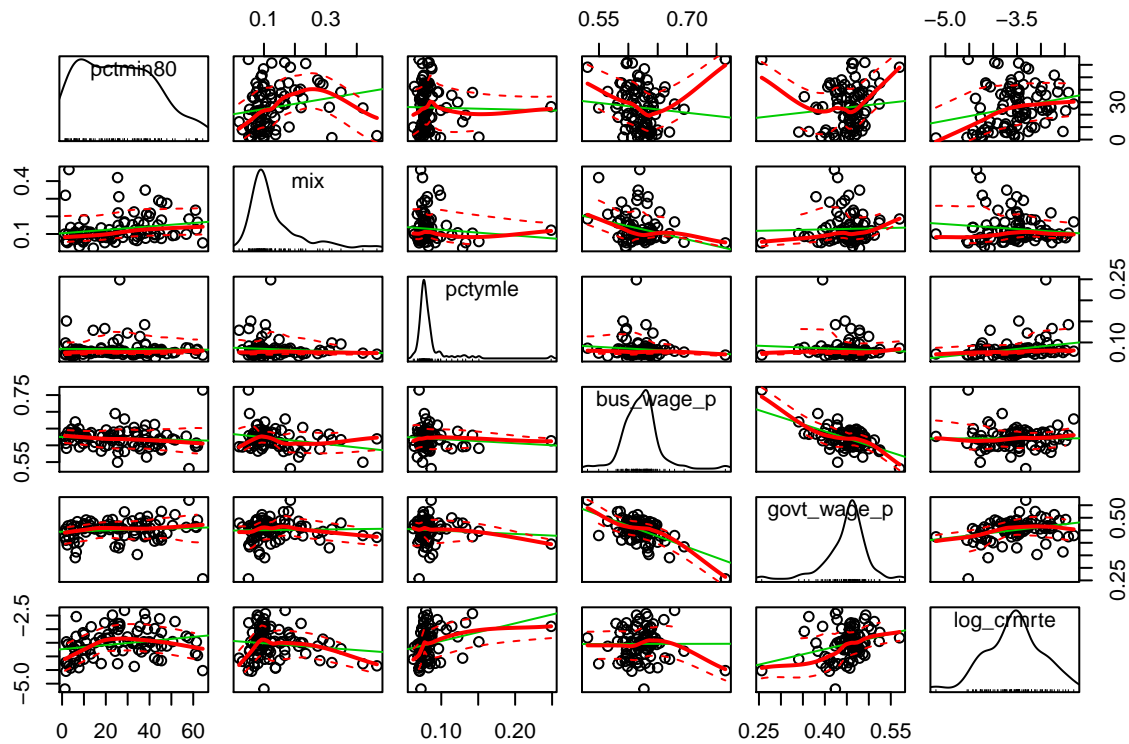
Scatterplot matrix using logs for crime rate, taxpc, density and polpc shows a clear correlation between crime rate and taxpc and density. polpc in this case exactly follows crmrte suggesting that police are put in areas where there is more crime. As the police is not likely a cause of crime we should likely omit it. Again we see that probability of arrest has a stronger inverse correlation with crimerate than does probability of conviction.

```
scatterplotMatrix(crime[, (names(crime) %in% c("log_crmrte", "log_density", "prbarr", "prbconv", "prbp"))
```



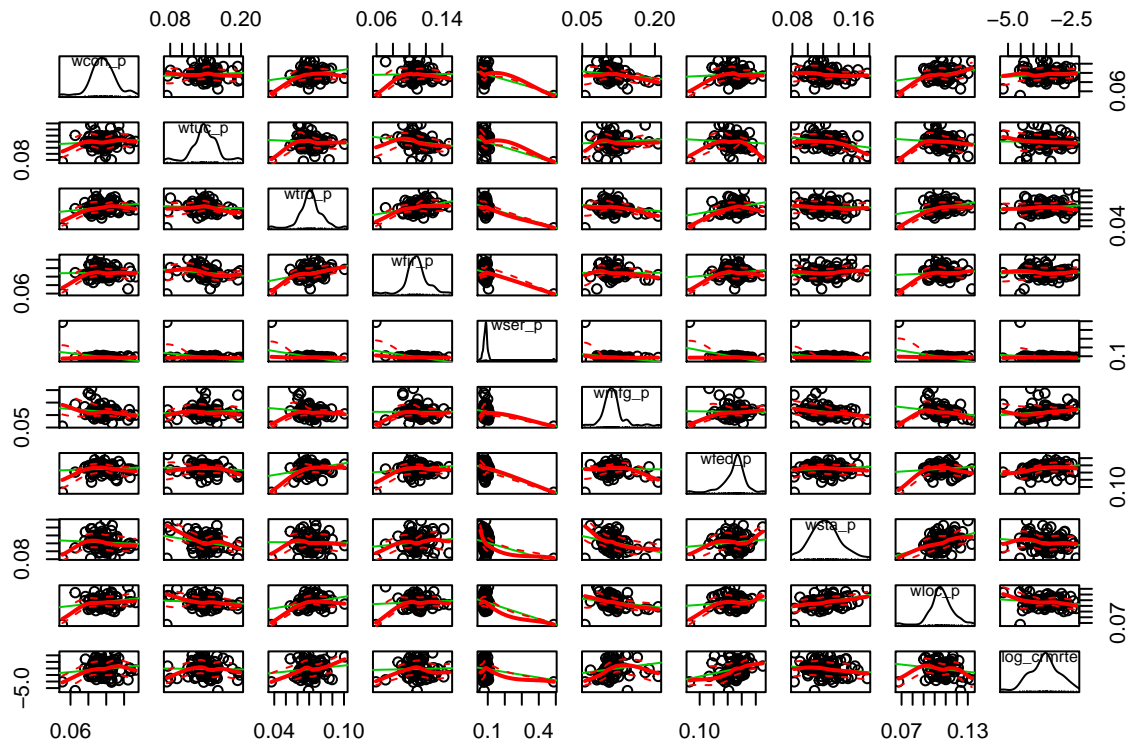
Scatterplot #2 shows that crime rate is negatively correlated with a higher proportion of government wages versus business wages (and the two are inversely related).

```
scatterplotMatrix(crime[, (names(crime) %in% c("log_crmrte", "pctmin80", "mix", "pctymle", "bus_wage_p
```

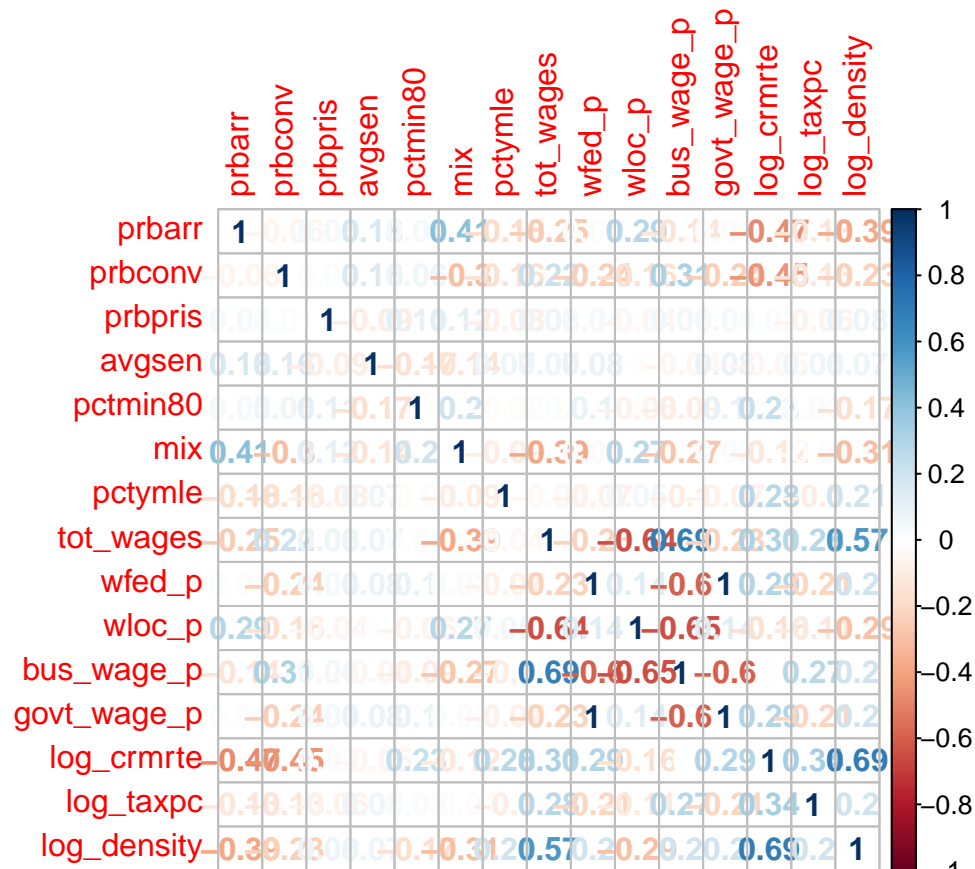


Scatterplot 3: Specific industries. While federal government wages are associated with higher crime rates, local govt wages are directionally linked with lower crime rates.

```
scatterplotMatrix(crime[ , (names(crime) %in% c("log_crmrte", "wcon_p", "wtuc_p", "wtrd_p", "wfir_p", "w
```



```
corrplot(cor(crime[, (names(crime) %in% c("log_crmrte", "log_density", "log_taxpc", "prbarr", "prbconv
```



Pulling out key metrics we can also see that percentage male has a relationship with policepc (positive) and probability of arrest (negative).

```
scatterplotMatrix(crime[, (names(crime) %in% c("log_crmrte", "log_density", "log_taxpc", "prbarr", "wf
```

