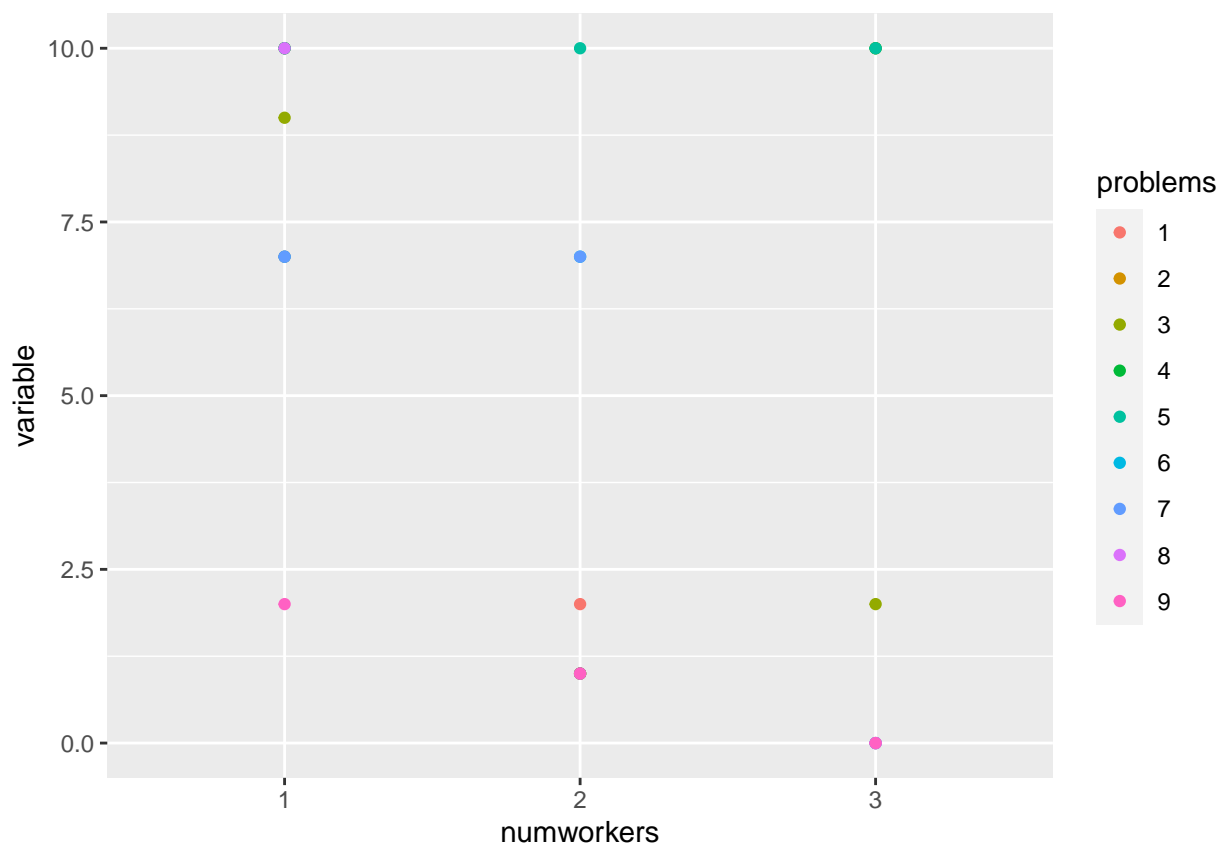


```
mydata = read.table("temp_1.txt", header = TRUE)
y = c(t(as.matrix(mydata)))
f = c("1", "2", "3")
a = 3
b = 9
workers = gl(a,1,a*b, factor(f))
questions = gl(b,a,a*b)
```

```
cleandata = data.frame(variable=y, numworkers=workers, problems=questions)
```

```
library(ggplot2)
ggplot(cleandata, aes(x=numworkers, y=variable, color=problems))+geom_point()
```



```
analysis = aov(variable~numworkers+problems, data = cleandata)
summary(analysis)
```

```
##           Df Sum Sq Mean Sq F value Pr(>F)
## numworkers  2  121.6   60.78    5.450 0.0157 *
## problems    8  168.0    21.00    1.883 0.1339
## Residuals   16  178.4    11.15
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
TukeyHSD(analysis)
```

```
## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = variable ~ numworkers + problems, data = cleandata)
##
## $numworkers
##      diff      lwr      upr    p adj
## 2-1 -4.5555556 -8.617750 -0.4933615 0.0270382
## 3-1 -4.4444444 -8.506638 -0.3822504 0.0311108
## 3-2  0.1111111 -3.951083  4.1733051 0.9972579
##
## $problems
##      diff      lwr      upr    p adj
## 2-1  4.000000e+00 -5.700315 13.7003155 0.8548928
## 3-1  1.000000e+00 -8.700315 10.7003155 0.9999834
## 4-1  4.000000e+00 -5.700315 13.7003155 0.8548928
## 5-1  7.000000e+00 -2.700315 16.7003155 0.2720177
## 6-1  1.666667e+00 -8.033649 11.3669822 0.9992527
## 7-1  1.666667e+00 -8.033649 11.3669822 0.9992527
## 8-1  6.666667e-01 -9.033649 10.3669822 0.9999993
## 9-1 -2.000000e+00 -11.700315  7.7003155 0.9973257
## 3-2 -3.000000e+00 -12.700315  6.7003155 0.9658551
## 4-2  1.776357e-15 -9.700315  9.7003155 1.0000000
## 5-2  3.000000e+00 -6.700315 12.7003155 0.9658551
## 6-2 -2.333333e+00 -12.033649  7.3669822 0.9925589
## 7-2 -2.333333e+00 -12.033649  7.3669822 0.9925589
## 8-2 -3.333333e+00 -13.033649  6.3669822 0.9395172
## 9-2 -6.000000e+00 -15.700315  3.7003155 0.4486250
## 4-3  3.000000e+00 -6.700315 12.7003155 0.9658551
## 5-3  6.000000e+00 -3.700315 15.7003155 0.4486250
## 6-3  6.666667e-01 -9.033649 10.3669822 0.9999993
## 7-3  6.666667e-01 -9.033649 10.3669822 0.9999993
## 8-3 -3.333333e-01 -10.033649  9.3669822 1.0000000
## 9-3 -3.000000e+00 -12.700315  6.7003155 0.9658551
## 5-4  3.000000e+00 -6.700315 12.7003155 0.9658551
## 6-4 -2.333333e+00 -12.033649  7.3669822 0.9925589
## 7-4 -2.333333e+00 -12.033649  7.3669822 0.9925589
## 8-4 -3.333333e+00 -13.033649  6.3669822 0.9395172
## 9-4 -6.000000e+00 -15.700315  3.7003155 0.4486250
## 6-5 -5.333333e+00 -15.033649  4.3669822 0.5898286
## 7-5 -5.333333e+00 -15.033649  4.3669822 0.5898286
## 8-5 -6.333333e+00 -16.033649  3.3669822 0.3838767
## 9-5 -9.000000e+00 -18.700315  0.7003155 0.0800867
## 7-6  0.000000e+00 -9.700315  9.7003155 1.0000000
## 8-6 -1.000000e+00 -10.700315  8.7003155 0.9999834
## 9-6 -3.666667e+00 -13.366982  6.0336488 0.9025759
## 8-7 -1.000000e+00 -10.700315  8.7003155 0.9999834
## 9-7 -3.666667e+00 -13.366982  6.0336488 0.9025759
## 9-8 -2.666667e+00 -12.366982  7.0336488 0.9828497
```