Difference-In-Difference-Tool-Life

SP

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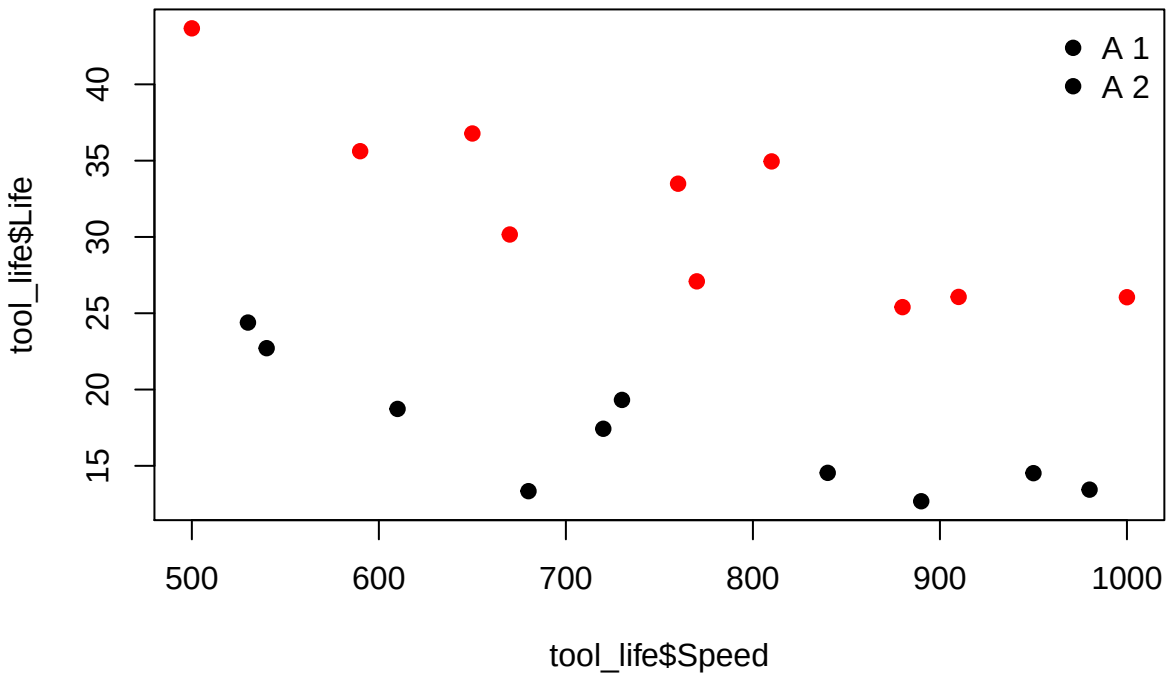
Dataset : tool life (in hours) lathe speed (rpm) pre intervention (Status A) post intervention (Status B)

```
tool_life<-read.csv("Tool.csv")
tool_life
```

```
##     Life Speed Status
## 1  18.73   610      A
## 2  14.52   950      A
## 3  17.43   720      A
## 4  14.54   840      A
## 5  13.44   980      A
## 6  24.39   530      A
## 7  13.34   680      A
## 8  22.71   540      A
## 9  12.68   890      A
## 10 19.32   730      A
## 11 30.16   670      B
## 12 27.09   770      B
## 13 25.40   880      B
## 14 26.05  1000      B
## 15 33.49   760      B
## 16 35.62   590      B
## 17 26.07   910      B
## 18 36.78   650      B
## 19 34.95   810      B
## 20 43.67   500      B
```

```
plot(tool_life$Speed, tool_life$Life, col = rep(1:2, each = 10), pch = 19)
legend("topright", legend = paste("A", 1:2), pch = 19, col = 1, bty = "n")
```




```
lm_model=lm(Life ~ ., data = tool_life)
summary(lm_model)
```

```
##
## Call:
## lm(formula = Life ~ ., data = tool_life)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -5.5527 -1.7868 -0.0016  1.8395  4.9838
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 36.98560    3.51038  10.536 7.16e-09 ***
## Speed       -0.02661    0.00452  -5.887 1.79e-05 ***
## StatusB     15.00425    1.35967  11.035 3.59e-09 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 3.039 on 17 degrees of freedom
## Multiple R-squared:  0.9003, Adjusted R-squared:  0.8886
## F-statistic: 76.75 on 2 and 17 DF,  p-value: 3.086e-09
```

```
anova(lm_model)
```

```
## Analysis of Variance Table
##
## Response: Life
##           Df  Sum Sq Mean Sq F value    Pr(>F)
## Speed      1  293.01  293.01  31.716 2.990e-05 ***
## Status     1 1125.03 1125.03 121.776 3.587e-09 ***
## Residuals 17  157.05    9.24
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
par(mfrow=c(2,2))
plot(lm_model)
```