HW6

1. Given the five pairs of (x, y) values,

x :	0	1	6	3	5
y :	4	3	0	2	1

(a) Find the least squares estimates of slope and intercept, determine the best fitting straight line (use R program).

(b) Test H0: $\beta 1 = 0$ versus H1: $\beta 1 \neq 0$ with $\alpha = 0.05$.

(c) Obtain a 95% confidence interval for the fitted value given x=1.

(d) Calculate R-squared.

2. This is the R output of a linear regression model:

```
Call:
lm(formula = y ~ x)
Residuals:
    Min      1Q  Median      3Q     Max
-2.7252 -1.2076 -0.3564  1.2183  2.8928
Coefficients:
             Estimate  Std. Error  t value  Pr(>|t|)
(Intercept) 23.6409    16.4171     1.440     0.1754
     x       0.6527    0.2416      2.702     0.0192 *
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Signif. codes: 0 "***" 0.001 "**" 0.01 "*" 0.05 "." 0.1 " " 1
Residual standard error: 1.779 on 12 degrees of freedom
Multiple R-squared: 0.3782, Adjusted R-squared: 0.3264
F-statistic: 7.3 on 1 and 12 DF, p-value: 0.01924
```

(a) What are the estimates of β_0 and β_1?

(b) Using $\alpha = 0.05$ to test on $H_0: \beta_1 = 0$ vs $H_1: \beta_1 \neq 0$. What is the conclusion?

(c) Compute the sum of squares error and sum of squares total for this model.

(d) For $x = 70$, use the model to predict y and construct prediction interval with 95% confidence level.