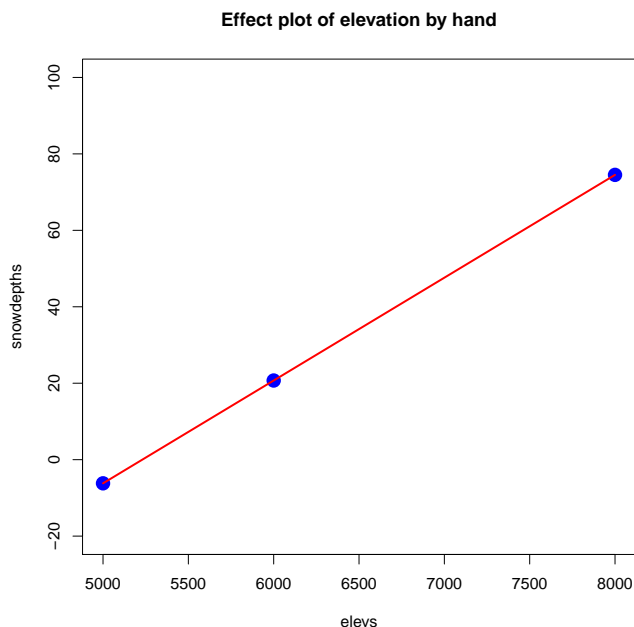


## STAT 217: MLR Model (in class 4/13)

```
lm.snow <- lm(Snow.Depth~Max.Temp+Min.Temp+Elevation, data=snow)
summary(lm.snow)

##
## Call:
## lm(formula = Snow.Depth ~ Max.Temp + Min.Temp + Elevation, data = snow)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -29.51  -7.68  -3.14   9.63  26.39
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -10.50653   99.61629  -0.11   0.917
## Max.Temp     -0.56189    0.67322  -0.83   0.413
## Min.Temp     -0.50497    2.04261  -0.25   0.807
## Elevation      0.01233    0.00654   1.89   0.073 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 13.6 on 21 degrees of freedom
## Multiple R-squared:  0.648, Adjusted R-squared:  0.598
## F-statistic: 12.9 on 3 and 21 DF, p-value: 5.33e-05
```



1. The following dataset contains the SAT verbal and SAT math scores of 1000 college graduates, as well as their college GPA. The results of the linear model output are shown below.

```
lm.sat <- lm(FYGPA~SATV+SATM, data=satGPA)
summary(lm.sat)

##
## Call:
## lm(formula = FYGPA ~ SATV + SATM, data = satGPA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.1965 -0.4478  0.0289  0.4572  1.6094
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.00737    0.15229   0.05    0.96
## SATV         0.02539    0.00286   8.88 < 2e-16 ***
## SATM         0.02239    0.00279   8.04 2.6e-15 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.658 on 997 degrees of freedom
## Multiple R-squared:  0.212, Adjusted R-squared:  0.211
## F-statistic: 134 on 2 and 997 DF, p-value: <2e-16
```

- (a) What is the response variable, and what is (are) the explanatory variable(s)?
  
- (b) Write out the true AND estimated models.
  
- (c) Write out the hypotheses being tested next to each p-value in the summary table above.
- (d) Write out your conclusion for the slope coefficient on SAT Math.
  
- (e) Interpret the slope coefficient estimate for SAT Math in context of the problem.
  
- (f) What does 'after controlling for' the SAT verbal score mean in this context?