Lab 11

Kristina Arevalo

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Problem 1

```
X <- c(1,4,3,2,5,4,3,6,7,8)
Y <- c(1,3,6,7,8,2,8,7,6,9)
```

An X and Y variable contain the above numbers.

- Compute Pearson's and report the associated p-value using the cor.test() function. (2 points)

```
xy.cor <- cor.test(X,Y)
```

Given these X & Y variables, we found $r = .51$, 95% CI $[-.18, .86]$, $t(8) = 1.67$, $p = .133$

- Use a permutation test to create a null-distribution, and report the p-value for getting the observed correlation or larger using your simulated null-distribution. (2 points)

```
sim_rs <- replicate(1000,cor(sample(X),sample(Y)))
length(sim_rs[sim_rs <= cor(X,Y)])/1000
```

```
## [1] 0.932
```

Problem 2

Using the variables X and Y above, and assuming that the values could be re-ordered in any way, report the following:

- the smallest possible sum of cross-products (1 point)

```
sim_sums <- replicate(1000,sum(sample(X)*sample(Y)))
min(sim_sums)
```

```
## [1] 196
```

- the largest possible sum of cross-products (1 point)

```
max(sim_sums)
```

```
## [1] 292
```