Lab1

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Lab 1

Question 1

```
#x = tree heights in meter
#y = tree diameters in centimeters

x <- c(0,1,2,3,4,5,6,7,8,9,10)
y <- c(2.96, 4.20, 2.84, 3.84, 6.57, 6.95, 9.32, 10.57, 9.72, 11.57, 11.53)
xy <- data.frame(x = x, y = y)
#create data frame, column 'x' has values from list 'x', column 'y' has values from list 'y'


print(paste("The mean tree height is", round(mean(xy$x), 2) , "meters."))
```

```
## [1] "The mean tree height is 5 meters."
```

```
#calculate mean of height, round two places
print(paste("The mean tree diameter is", round(mean(xy$y), 2), "centimeters."))
```

```
## [1] "The mean tree diameter is 7.28 centimeters."
```

```
#calculate mean of diameter, round to two places

print(paste("The median tree height is", quantile(xy$x, probs = .50) , "meters."))
```

```
## [1] "The median tree height is 5 meters."
```

```
#calculate median of height using 50th quantile
print(paste("The median tree diameter is", quantile(xy$y, probs = .50), "centimeters."))
```

```
## [1] "The median tree diameter is 6.95 centimeters."
```

```
#calculate median of diameter using 50th quantile
```

Question 2

```r
print(paste("The range of tree height is", (range(xy$x)) , "meters."))
```

```
## [1] "The range of tree height is 0 meters."
## [2] "The range of tree height is 10 meters."
```

```r
#calculate range of tree height
print(paste("The range of tree diameter is", (range(xy$y)) , "centimeters."))
```

```
## [1] "The range of tree diameter is 2.84 centimeters."
## [2] "The range of tree diameter is 11.57 centimeters."
```

```r
#calculate diameter of tree height

print(paste("The variance of tree height is", round((var(xy$x)),2) , "meters."))
```

```
## [1] "The variance of tree height is 11 meters."
```

```r
#calculate variance of tree height
print(paste("The variance of tree diameter is", round((var(xy$y)),2) , "centimeters."))
```

```
## [1] "The variance of tree diameter is 11.77 centimeters."
```

```r
#calculate variance of tree diameter

print(paste("The standard deviation of tree height is", round((sd(xy$x)),2) , "meters."))
```

```
## [1] "The standard deviation of tree height is 3.32 meters."
```

```r
#calculate standard deviation of tree height
print(paste("The standard deviation of tree diameter is", round((sd(xy$y)),2) , "centimeters."))
```

```
## [1] "The standard deviation of tree diameter is 3.43 centimeters."
```

```r
#calculate standard deviation of tree diameter
```

Question 3

```r
height_diameter_scatter <- ggplot(xy, aes(x = x, y = y)) +
  geom_point() +
  xlab("Tree height in meters") +
  ylab("Tree diameter in centimeters") +
  ggtitle("Relationship between tree height and diameter")
  geom_abline(slope = 2, intercept = 1) #+
```

```
## mapping: intercept = ~intercept, slope = ~slope
## geom_abline: na.rm = FALSE
## stat_identity: na.rm = FALSE
## position_identity
```

```
  #Intercept:Tree height is zero, tree diameter will be 1,
  #slope: for every 2 cm increase in diameter tree height will increase by 1
  #geom_smooth(method = "lm") + #Uncomment these lines to add actual regression line
  #stat_poly_eq(use_label(c("eq", "R2")), color = "blue")

#H0: The relationship between tree height and diameter is positive

print(height_diameter_scatter)
```