Math Stat Assignment

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Question 10.b

```r
gpa_univ_a <- c(1.33, 1.52, 2.02, 2.05, 2.14, 2.29, 2.36, 2.42, 2.48, 2.62, 2.71,
                2.81, 2.81, 2.82, 2.96, 2.99, 3.11, 3.12, 3.12, 3.18, 3.21, 3.25,
                3.37, 3.58, 3.70)
gpa_univ_b <- c(1.57, 1.97, 2.00, 2.06, 2.07, 2.11, 2.48, 2.51, 2.64, 2.75, 2.77,
                2.82, 3.04,3.08, 3.11, 3.15, 3.25, 3.27, 3.27, 3.36, 3.45, 3.45,
                3.49, 3.74, 3.80)
```

```r
print("Summary GPA University A")
```

```
## [1] "Summary GPA University A"
```

```r
summary(gpa_univ_a)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.330   2.360   2.810   2.719   3.120   3.700
```

```r
print("Summary GPA University B")
```

```
## [1] "Summary GPA University B"
```

```r
summary(gpa_univ_b)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.570   2.480   3.040   2.848   3.270   3.800
```

```r
sd(gpa_univ_a)
```

```
## [1] 0.59873
```

```r
var(gpa_univ_a)
```

```
## [1] 0.3584777
```

```r
sd(gpa_univ_b)
```

```
## [1] 0.6148488
```

```r
var(gpa_univ_b)
```

```
## [1] 0.378039
```

From the summary above, we can derive some descriptive statistics. Firstly, we can see that the mean for GPA of students from University A is **2.719** while the mean for GPA of students from University B is **2.848**. This shows that on average students from University A has a slightly higher GPA than students from University B.

Next, the variance and standard deviation for mean GPA of University B are also higher than the variance and standard deviation for mean GPA of University A. This indicates that GPA variability in University B is slightly higher than University A.

```r
par(mfrow=c(1,2))
hist(gpa_univ_a, breaks = 10, main = 'Histogram of GPA of Uni A', xlab = 'GPA')
hist(gpa_univ_b, breaks = 10, main = 'Histogram of GPA of Uni B', xlab = 'GPA')
```
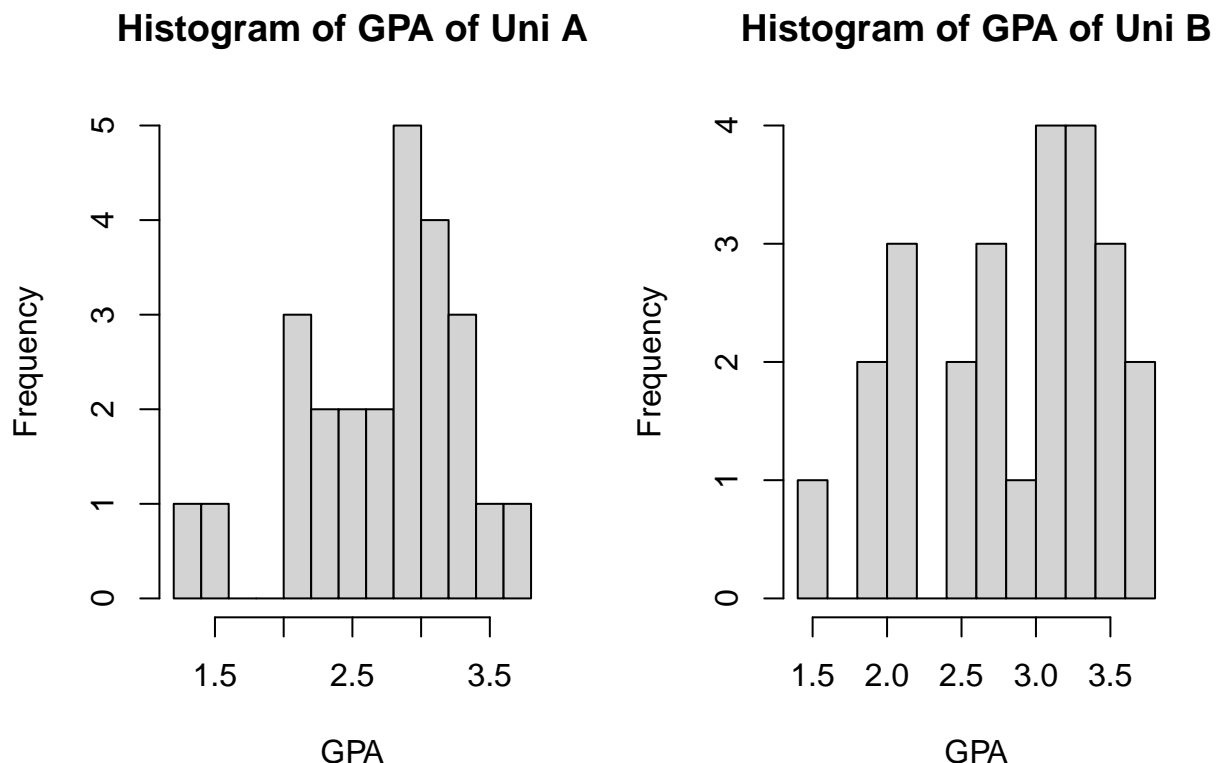

From the histogram above, we can say that both Universities has a roughly symmetrical distribution for their students' GPA but University B's GPA distribution is more slightly skew to the left compared to the distribution of students GPA in University A.

```
par(mfrow=c(1,2))
boxplot(gpa_univ_a, horizontal = T, main = "GPA University A")
boxplot(gpa_univ_b, horizontal = T, main = "GPA University B")
```

GPA University A
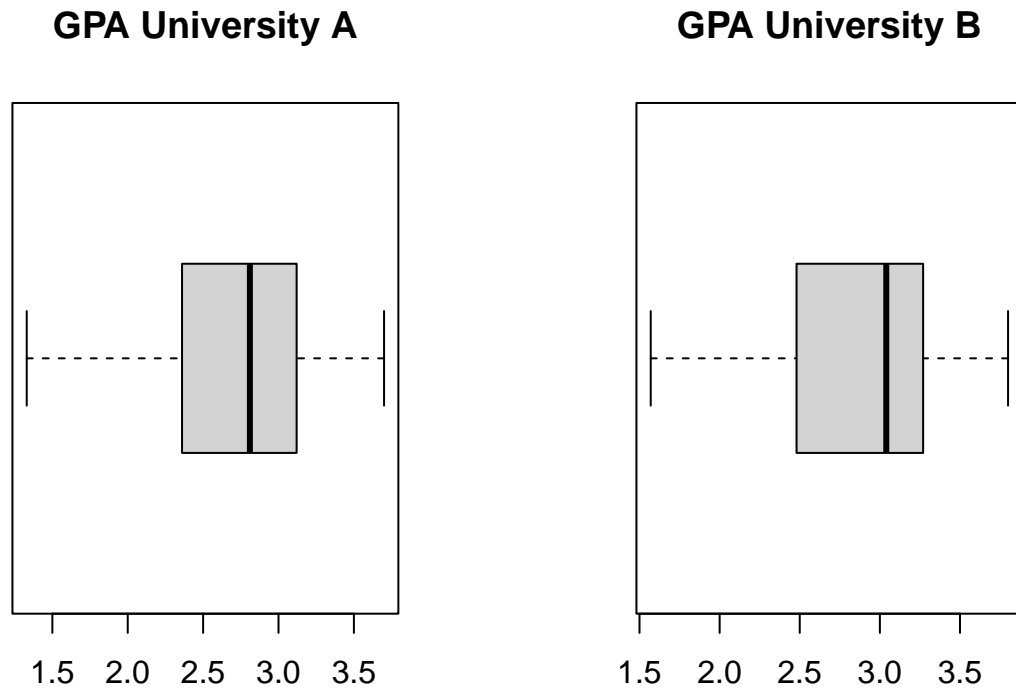
GPA University B

From the boxplot above, we can see that the median of GPA of students from University A is lower that the median of GPA of students from University B. Next, both plots show a slightly longer tail on the left meaning that the distribution is slightly skew to the left. It can be interpreted as GPA of students from University B are slightly shifted towards higher values compared to University A. There are also no outliers that can be observed form the boxplot.