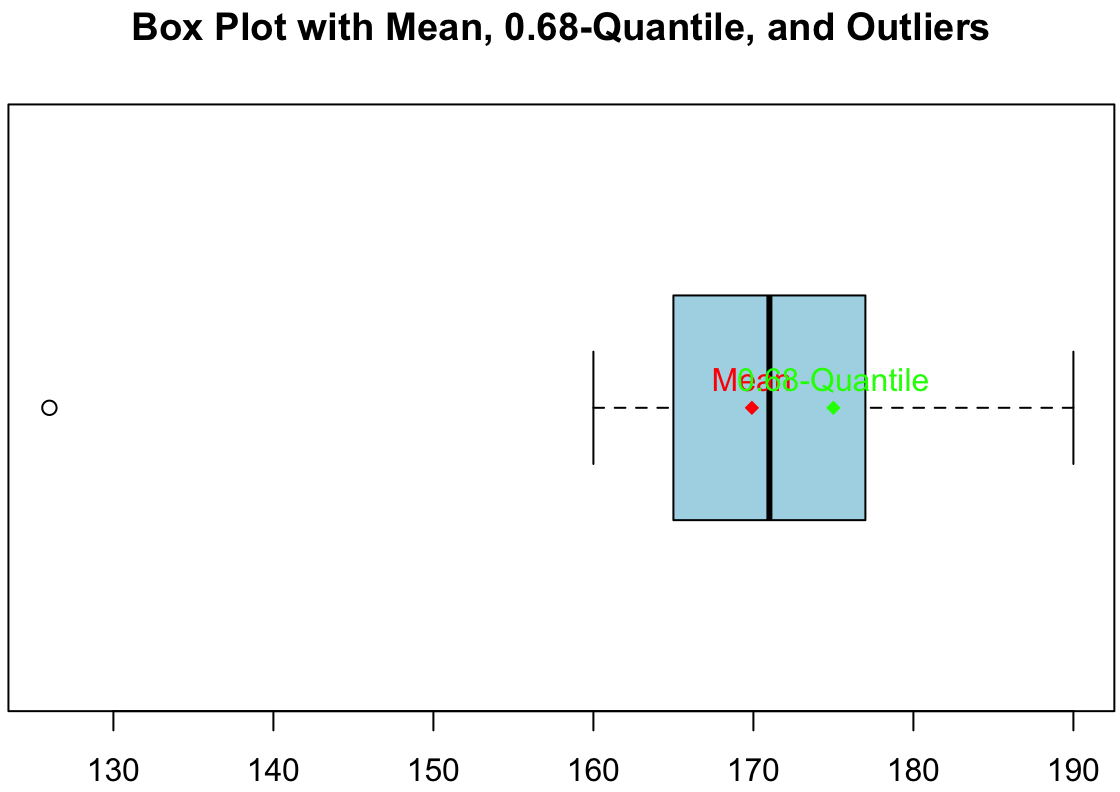
Quiz1

2024-02-15

Problem 1




```
## Mean: 169.9048
```

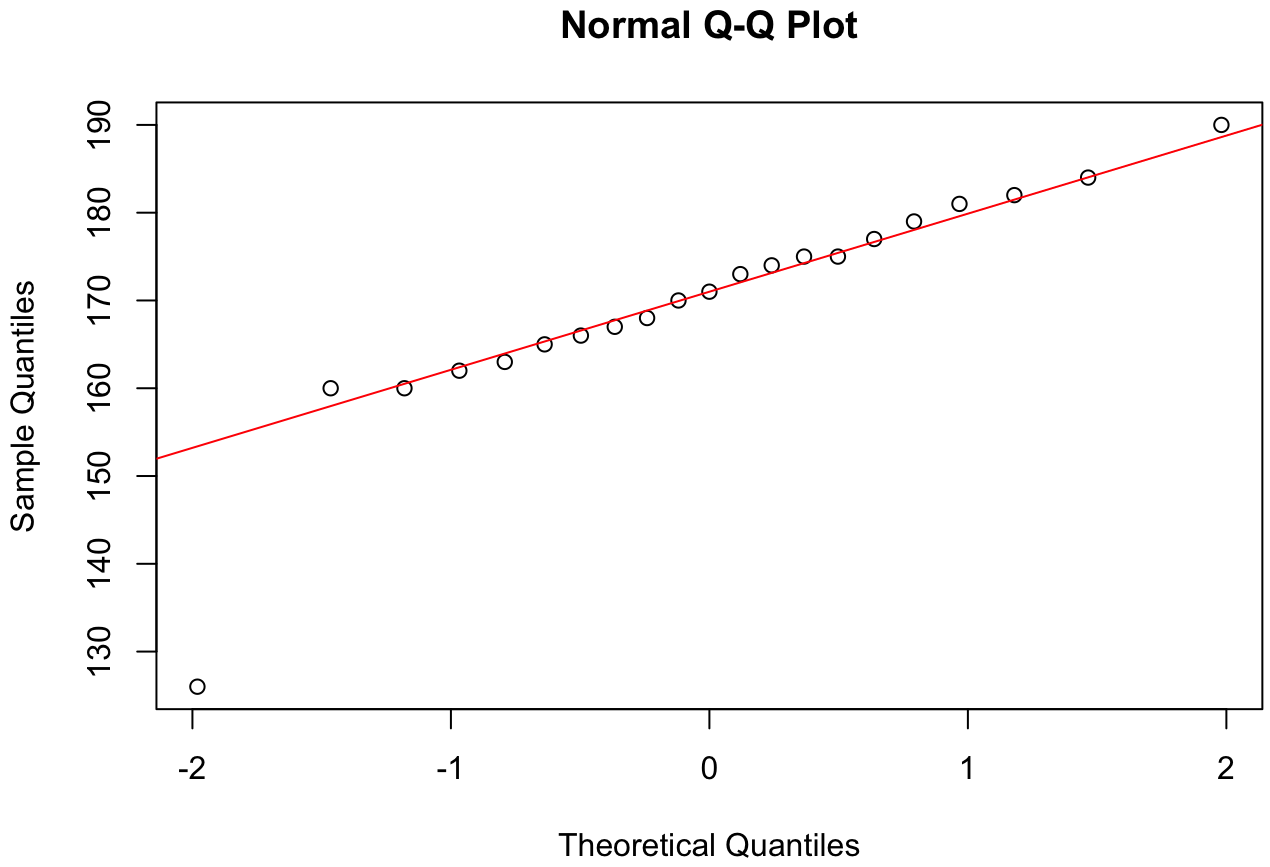
```
## 0.68-Quantile: 175
```

```
## Q1: 165
```

```
## Q2 (Median): 171
```

```
## Q3: 177
```

```
## Outliers: 126
```



Problem 2

```
## IQR: 12
```

```
## Variance: 168.4905
```

```
## Standard Deviation: 12.98039
```

```
## Mean: 169.9048
```

```
## Median: 171
```

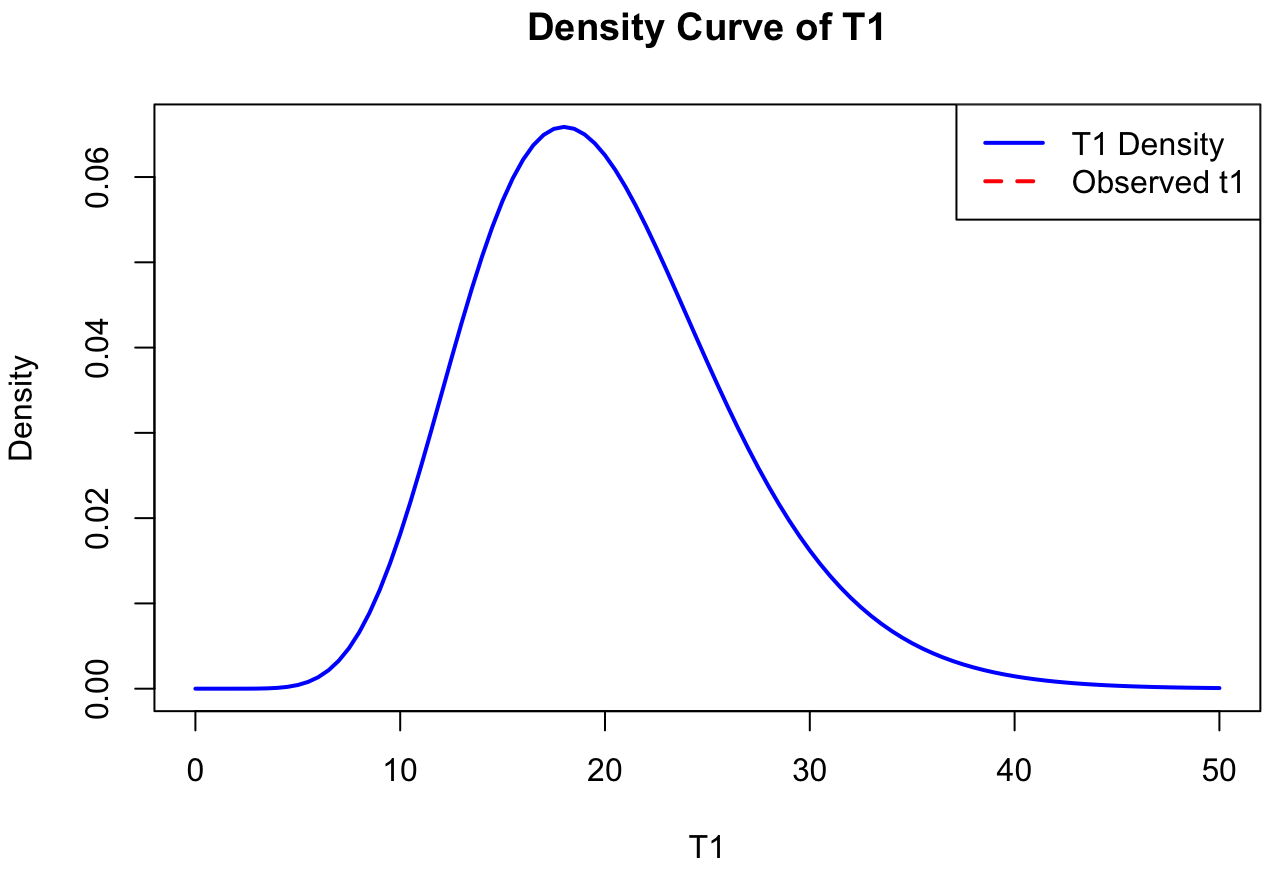
```
## The distribution is negatively skewed.
```

Problem 3

i

```
## Observed value t1: 130.5769
```

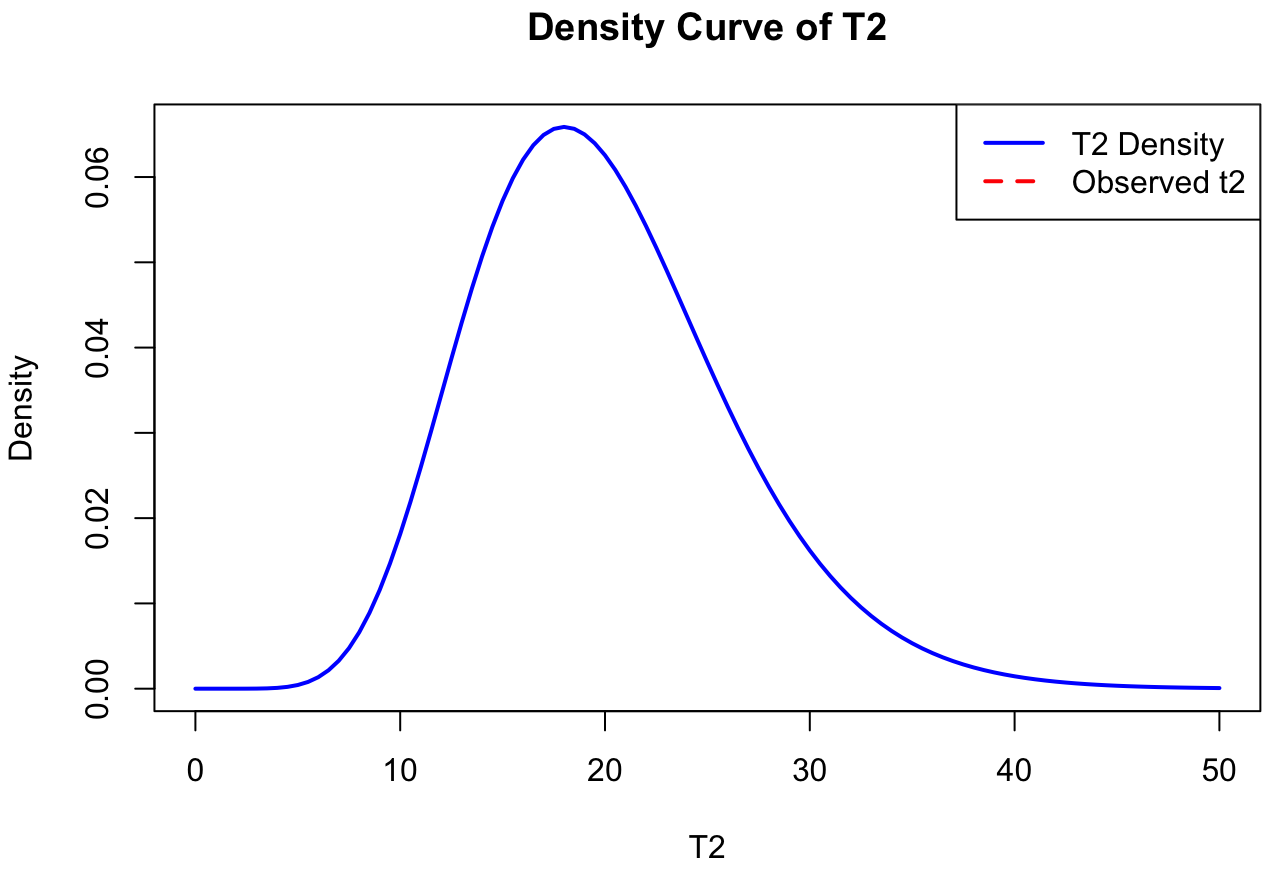
```
## P(|T1| <= |t1|): 1
```



ii

```
## Observed value t2: 129.6081
```

```
## P(|T2| <= |t2|): 1
```



iii

No they are not different because both are calculated based on chi-square distributions.

iv

t-distribution t3 = -0.984309 P(T3>t3) = 0.8316388

v

student t-distribution t4 = -0.38666112 P(T4>t4) = 0.648454

Problem 4

i. Linear Combination of Normal Random Variables
ii. Sum of Scaled Chi-Squared Random Variables

iii. Ratio of Normal to Square Root of a Weighted Sum of Chi-Squared Variables
iv. Ratio of Two Chi-Squared Variables

Problem 5

i.
ii. The first one is a normal distribution N(0,1) The second one is a chi-squared distribution.
iii.

The mathematical expectation of the first one is σ2 and for the second one the (n-1)/n σ2

iii. They are not independent and uncorellated because the covariance between mu squared and σ2 is zero.