

# Chi-squared Hypothesis Testing

## Chi-squared Tests

### Goodness of Fit

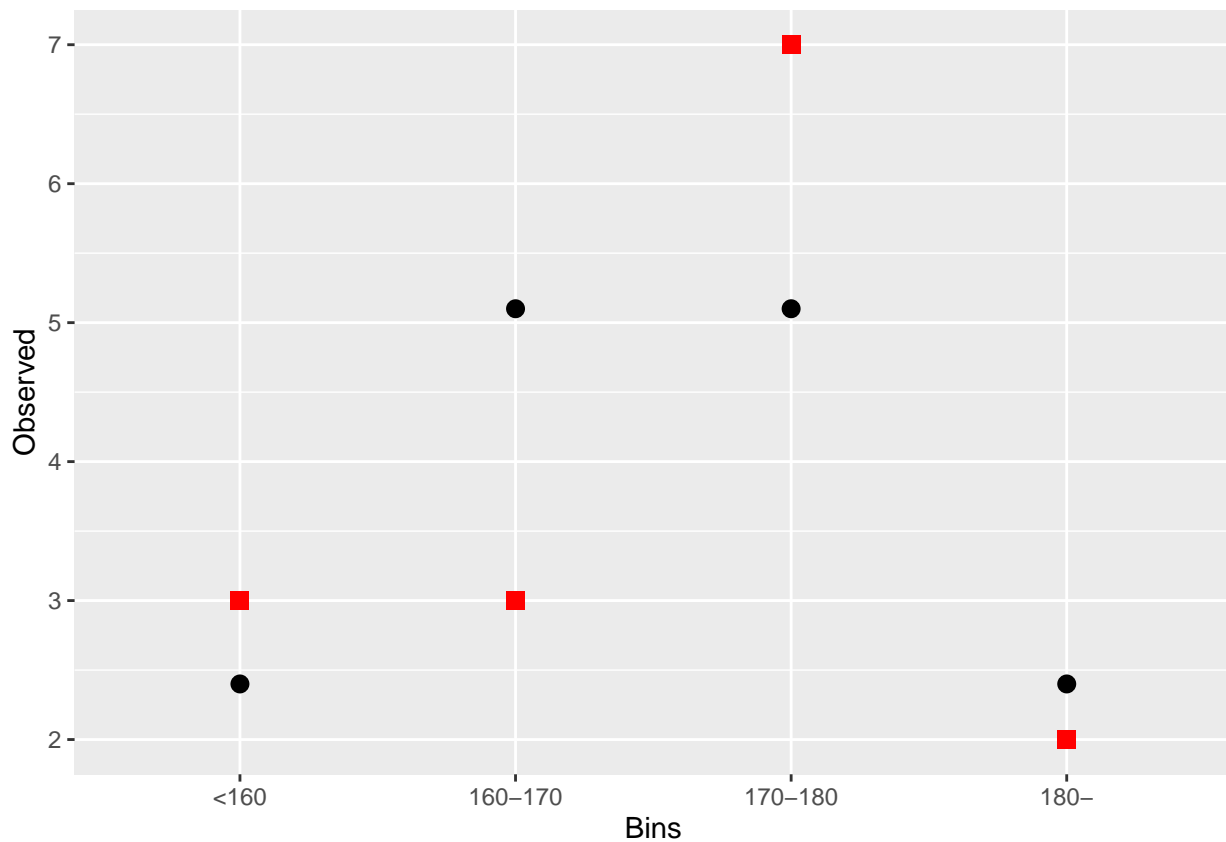
#### Example 1

Use the Chi-squared test to investigate if the observed data is different from the predicted data

- i For a normal distribution with mean 170cm and mean 10cm

Bins	Observed	Expected
<160	3	2.4
160-170	3	5.1
170-180	7	5.1
180-	2	2.4

```
## geom_path: Each group consists of only one observation. Do you need to adjust
## the group aesthetic?
```



```
##
```

```
## Chi-squared test for given probabilities
##
## data: Observed
## X-squared = 1.7892, df = 3, p-value = 0.6173
```

- ii For a flat distribution

Bins	Observed	Expected
<160	3	3.75
160-170	3	3.75
170-180	7	3.75
180-	2	3.75

```
##
## Chi-squared test for given probabilities
##
## data: Observed
## X-squared = 3.9333, df = 3, p-value = 0.2688
```

## Test of Independence

An ice-cream company had 500 people sample one of three different ice-cream flavours and asked them to say whether they liked or disliked the ice-cream. The resulting observed data is presented in the table below

```
##           Vanilla Chocolate Strawberry
## Liked      130          170          100
## Disliked    20           30           50
```

Conduct a hypothesis test to determine if these data supply evidence ( $\alpha = 0.05$ ) that the enjoyment of the ice-cream depends on the flavour

```
##
## Pearson's Chi-squared test
##
## data: Icecream
## X-squared = 23.958, df = 2, p-value = 6.274e-06
```

