

STAT5002 Weekly Independent Exercises

Sheet 5 - Week 8

STAT5002

1 Tests for proportions

A market research company conducts regular opinion polls to get some idea of support for different political parties over time. On 13 May, 2024 it released the results of a poll based on “a representative cross-section of 1,654 Australian electors from May 6-12, 2024”; see [original article](#). It found that on a “two-party preferred” basis, 52% of those surveyed indicated support for Labor, while the remaining 48% supported the Liberal/Nationals coalition.

1.1

Describe a box model we could use for making an inference about the “true” proportion p of electors in Australia who would support Labor on a two-party preferred basis (that is, if asked to choose between Labor and the Liberal/National coalition) based on this data. Comment on the suitability of your model for this example.

1.2

Estimate the standard error of the sample proportion. If necessary, round to 3 decimal places.

1.3

Is the value $p = 0.50$ included in a 95% Wilson confidence interval for p based on this data? The R output below may be helpful:

```
round(qnorm(0.95), 2)
```

```
[1] 1.64
```

```
round(qnorm(0.975), 2)
```

```
[1] 1.96
```

1.4

Would the test of $H_0: p = 0.5$ versus the alternative $H_1: p \neq 0.5$ be rejected at the 5% level of significance? What about at the 10% level of significance?