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Statistics for laboratory scientists II

Solutions for the homework problems for lecture 1

1. We have $n_A=78$ and $n_B=22$. We test that $p_A=0.75$.

Typing either

```
round(binom.test(78, 100, 0.75)$p.value, 2)
```

or

```
1 - pbinom(77, 100, 0.75) + pbinom(75-3, 100, 0.75)
```

returns 0.56 as a p-value.

- We have the data $n_{AA}=35$, $n_{AB}=43$, $n_{BB}=22$. We test that $(p_{AA}, p_{AB}, p_{BB})=(0.25, 0.5, 0.25)$.

a. Typing

```
f <- c(25, 50, 25)
fhat <- c(35, 43, 22)
lnL <- sum(fhat*log(fhat/f))
G <- 2*lnL
round(1-pchisq(G, 2), 3)
```

yields a p-value of 0.084.

b. Typing

```
round(1-pchisq(sum((f-fhat)^2/f), 2), 3)
```

or

```
chisq.test(c(35, 43, 22), p=c(0.25, 0.5, 0.25))
```

yields a p-value of 0.069.