ST2132 HW5
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Problem 1.

Answer: We find Expected(E) $= \frac{1361}{4} = 340.25$

Observed	Expected	$(O-E)^2/E$
340	340.25	0.000184
395	340.25	8.81
358	340.25	0.926
268	340.25	15.3

The test statistic is then given as

$$q_{4-1} = 0.000184 + 8.81 + 0.926 + 15.3 = 25.07788$$
$$\chi^2_{0.01}(3) = 11.34$$

Since $q_3 = 25.07788 > \chi^2_{0.01}(3) = 11.34$ we reject H_0 at 1% significance level. □

Problem 2.

Answer: i) We have $h = 3$ rows and $k = 4$ columns in the table and thus $(h-1)(k-1) = 6$ degrees of freedom. ii)

Concussions	0	1	2	≥ 3	Total
Soccer	45 (59.91)	25 (17.06)	11 (8.34)	10 (5.69)	91
N-S Athletes	68 (63.2)	15 (18.00)	8 (8.80)	5 (6.00)	96
Non-Athletes	45 (34.89)	5 (9.94)	3 (4.86)	0 (3.31)	53
Total	158	45	22	15	240

iii) The test-statistic is found as: $q = 22.029$ and we have $\chi^2_{0.05}(6) = 12.59$
Since $q = 22.029 > \chi^2_{0.05}(6) = 12.59$ we reject H_0 at 5% significance level.

□

Problem 3. *Refer to code*