Consider the **movies\_data** dataset provided.

Question 1

Focusing on the variable 'oldness', which represents the age of the movies. Test whether the proportion of movies older than 10 years is greater than 0.5.

Repeat the test for movies older than 20 years.

The alternative hypothesis is that the population proportion is greater than the specified threshold. For movies older than 10 years, the **test statistic** is (X Blank 1) and the **p-value is** (X Blank 2), so we (reject/fail to reject) the null hypothesis.

For movies older than 20 years, the test statistic is (X Blank 4) and the **p-value is** (X Blank 5), so we (reject/fail to reject) the null hypothesis.

Question 2

Test whether there exists enough evidence to claim that the average age of movies in the year 2002 is equal to 52 years. Repeat the test for the year 1962. Clearly state the hypotheses and explain your results. Use an alpha level of 0.1 and report results rounded to four decimal places.

For the year 2002, the test statistic is (X Blank 7) and the p-value is (X Blank 8), so we (reject/fail to reject) the null hypothesis. For the year 1962, the test statistic is (X Blank 10) and the p-value is (X Blank 11), so we (reject/fail to reject) the null hypothesis.

Question 3

Consider the dataset provided, focusing on the variable 'gross\_adjusted', which represents the adjusted gross of movies. Test whether the average adjusted gross of movies released in 1977 is different between those from Oceania and European countries. Clearly state the hypotheses and explain your results. Use an alpha level of 0.15 and report results rounded to four decimal places.

For the year 1977, the test statistic is (X Blank 13) and the p-value is (X Blank 14), so we (reject/fail to reject) the null hypothesis and we conclude that the means are (the same/different).

**Questions 4**

Two groups participate in a Mathematics Olympiad competition, one from IE University's Segovia campus, and the other from the Madrid campus. Is the average score in the Segovia campus are less that in Madrid? Assume both populations are approximately Normally distributed and have equal variances. Use an alpha level of 0.01 and report results rounded to four decimal places. The provided data is as follows:

Sample mean in Segovia (x\_SG): 6.72

Sample mean in Madrid (x\_MM): 5.53

Sample standard deviation in Segovia (s\_SG): 1.47

Sample standard deviation in Madrid (s\_MM): 1.56

Sample size in Segovia (n\_SG): 30

Sample size in Madrid (n\_MM): 35

The standard error is (Blank 16). The test statistic is (Blank 17), and the critical value is (Blank 18). The test statistic (does not belong/belongs) to the critical region, so we (reject/fail to reject) the null hypothesis and we conclude that (there is / there is no) (Blank 19) evidence to reject that grades in Segovia are less than or equal to those in Madrid.