

2.

a. The Wald test statistic is 5.9595 with a p-value of 0.01464 using approximation of standard normal distribution, or a p-value of 0.02206 with an F-test for significance of LI. Either way, the p-value is extremely small and evidences the rejection of the hypothesis that the parameter for LI is zero (0). The 95% Wald CI for LI is (0.02855487, 0.26117152). Taking the perspective of the odds by exponentiating the CI gives (1.028966, 1.298450). This suggests that an increase in labeling index (percentile) of cells by 1 unit increases the odds of cancer remission at a plausible value from ~2.90% to as much as ~29.85%.

b. LRT test yielded a test statistic approximating χ^2 value as 8.2988 with a p-value of 0.003967. This tiny p-value once again corroborates part a. that we reject the null hypothesis of the LI parameter being statistically no different than zero (0). The 95% CI for the parameter is (0.0425232, 0.2846668), but exponentiating gives a corresponding CI of odds of (1.043440, 1.329319). The interpretation is essentially the same as part a. with new values for the bounds. However, the CI interval for odds using LR is more trustworthy than Wald since LRT does not use an approximation of a distribution and is scale-invariant.

6.

a. Each 1000 euro increment increase in income drives up the odds of owning at least 1 travel credit card by 0.1054, according to the model.

b. The parameter for x has a Wald statistic of 16.18373 with a p-value of 5.748572e-05. This evidences against the hypothesis that no relationship between income and owning at least 1 travel credit card exists. In other words, the parameter for x can be seen as significant to the model.

c. The 95% Wald CI for the parameter for x is (0.054048, 0.156752). Exponentiating each bound gives the same CI adjusted for odds, being (1.055535, 1.169705).

12. Each of the binary scales of the Myers–Briggs personality test is set as a factor in the formula for the GLM model. The estimated coefficients for E/I (E = 0, I = 1) and S/N (S = 1, N = 0) are negative, indicating that having E rather than I increases the probability of frequent drinker, and similarly having N rather than S does the same, with all other indicators fixed for either case. However, the last two (2) indicators, namely T/F (T = 1, F = 0) and J/P (J = 0, P = 1), have positive estimated coefficients. Again keeping all other indicators fixed, having T rather than F would add to the systematic (linear) component of the GLM and increase the probability of frequent drinker, and the same can be said for someone with P rather than J. To maximize the probability of frequent drinking, the indicator variables must have values of 0, 0, 1, 1, or nominally speaking, ENTP.