1. The notation for panel data is \((X_{it}, Y_{it}), i=1, \ldots, n\) and \(t=1, \ldots, T\) because
   - A) we take into account that the entities included in the panel change over time and are replaced by others.
   - B) the X's represent the observed effects and the Y the omitted fixed effects.
   - C) there are \(n\) entities and \(T\) time periods.
   - D) \(n\) has to be larger than \(T\) for the OLS estimator to exist.

   **Correct answer(s): C**

2. The difference between an unbalanced and a balanced panel is that
   - A) you cannot have both fixed time effects and fixed entity effects regressions.
   - B) an unbalanced panel contains missing observations for at least one time period or one entity.
   - C) the impact of different regressors are roughly the same for balanced but not for unbalanced panels.
   - D) in the former you may not include drivers who have been drinking in the fatality rate/beer tax study.

   **Correct answer(s): B**

3. The Fixed Effects regression model
   - A) has \(n\) different intercepts.
   - B) the slope coefficients are allowed to differ across entities, but the intercept is “fixed” (remains unchanged).
   - C) has “fixed” (repaired) the effect of heteroskedasticity.
   - D) in a log-log model may include logs of the binary variables, which control for the fixed effects.

   **Correct answer(s): A**

4. In the Fixed Effects regression model, you should exclude one of the binary variables for the entities when an intercept is present in the equation
   - A) because one of the entities is always excluded.
   - B) because there are already too many coefficients to estimate.
   - C) to allow for some changes between entities to take place.
   - D) to avoid perfect multicollinearity.

   **Correct answer(s): D**

5. In the Fixed Effects regression model, using \((n - 1)\) binary variables for the entities, the coefficient of the binary variable indicates
   - A) the level of the fixed effect of the \(i\)th entity.
B) will be either 0 or 1.
C) the difference in fixed effects between the ith and the first entity.
D) the response in the dependent variable to a percentage change in the binary variable.

Correct answer(s): C

6. $\text{cov}(uit,uis |Xit,Xis)=0$ for $t \neq s$ means that
A) there is no perfect multicollinearity in the errors.
B) division of errors by regressors in different time periods is always zero.
C) there is no correlation over time in the residuals.
D) conditional on the regressors, the errors are uncorrelated over time.

Correct answer(s): D

7. With Panel Data, regression software typically uses an “entity-demeaned” algorithm because
A) the OLS formula for the slope in the linear regression model contains deviations from means already.
B) there are typically too many time periods for the regression package too handle.
C) the number of estimates to calculate can become extremely large when there are a large number of entities.
D) deviations from means sum up to zero.

Correct answer(s): C

8. If you included both time and entity fixed effects in the regression model which includes a constant, then
A) one of the explanatory variables needs to be excluded to avoid perfect multicollinearity.
B) you can use the “before and after” specification even for $T > 2$.
C) you must exclude one of the entity binary variables and one of the time binary variables for the OLS estimator to exist.
D) the OLS estimator no longer exists.

Correct answer(s): C

9. Consider estimating the effect of the beer tax on the fatality rate, using time and state fixed effect for the Northeast Region of the United States (Maine, Vermont, New Hampshire, Massachusetts, Connecticut and Rhode Island) for the period 1991-2001. If Beer Tax was the only explanatory variable, how many coefficients would you need to estimate, excluding the constant?
A) 18
B) 16
C) 7
D) 11

Correct answer(s): B

10. The main advantage of using panel data over cross sectional data is that it
A) gives you more observations.
B) allows you to analyze behavior across time but not across entities.
C) allows you to control for some types of omitted variables without actually observing them.
D) allows you to look up critical values in the standard normal distribution.

Correct answer(s): C