STATG006: Exercise Sheet #6

The exercises in this sheet focus on model selection and sparse regression. As in the previous sheet, some of the questions are from James et al., "An Introduction to Statistical Learning" (ISLR).

1. Exercise 1 of Chapter 6, ISLR.
2. Exercise 2 of Chapter 6, ISLR.
3. Exercise 3 of Chapter 6, ISLR.
4. Exercise 4 of Chapter 6, ISLR.
5. Exercise 5 of Chapter 6, ISLR.
6. Exercise 6 of Chapter 6, ISLR.
7. *(Adapted from SLS, Chapter 4)* Consider the solution to the group lasso problem when there is a single covariate which is a factor with 2 levels. Show that when there is an intercept β_0 in the model, the optimal coefficients for this factor sum to zero, that is, $\hat{\beta}_1 + \hat{\beta}_2 = 0$.
8. (Computer Implementation) Exercise 8 of Chapter 6, ISLR.
9. (Computer Implementation) Exercise 9 (except items (e) and (f)) of Chapter 6, ISLR.
10. (Computer Implementation) Exercise 10 of Chapter 6, ISLR.
11. (Computer Implementation) Exercise 11 (except subitems involving PCR) of Chapter 6, ISLR.