Econ 871
Homework #3

1) Discuss how to transform the errors in a multinomial probit model in order to reduce the number of integrals to evaluate by one. Show how the covariance matrix for the errors is unidentified.

2) Let wage be a function of exogenous characteristics X:

$$\begin{aligned} w &= X\beta + u \\ u &\sim N\left(0, \sigma^2 I\right). \end{aligned}$$

Wage is unobserved. Instead, we observe the variable

$$D_i = \begin{cases} 0 & \text{if } w_i \leq 3.5 \\ 1 & \text{if } 3.5 < w_i \leq 5 \\ 2 & \text{if } 5 < w_i \leq 8 \\ 3 & \text{if } 8 < w_i \leq 15 \\ 4 & \text{if } 15 < w_i \end{cases}.$$

Show how to estimate β.

3) Consider the model,

$$y_{ij}^* = X_{ij}\beta + u_{ij}$$

where

$$u_{ij} \sim iidEV.$$

Find

$$E \max_j y_{ij}^*.$$