Assignment 7

Consider the following DGP.

\[ y^*_i = \beta x_i + u_i \]

where

\[ u_i \sim iidN(0,1) \text{, or} \]
\[ u_i \sim iidU(-1,1) \]  

and

\[ y = 1 \{ y^*_i \geq 0 \} \]

Q1. (Monte Carlo Studies) Set \( n = 30, \beta = 0 \). You want to test the null hypothesis \( H_0 : \beta = 0 \), but don’t know about the distribution of \( u_i \). Show the size distortion of the conventional test statistic given by

\[ t_b = \frac{\hat{b}_{\logit}}{\sqrt{V(\hat{b}_{\logit})}} \]

Note: Set simulation size=100.

Q2. You want to run the probit regression and to estimate the marginal effects and their standard errors as well. Provide matlab code.