Assignment 7

Consider the following DGP.

$$y_i^* = \beta x_i + u_i$$

where

$$u_i \quad \sim \quad iidN\,(0,1)\,, \text{ or} \tag{1}$$
$$u_i \quad \sim \quad iidU\,(-1,1) \tag{2}$$

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

$$t_{\hat{b}} = \frac{\hat{b}_{\text{logit}}}{\sqrt{V\left(\hat{b}_{\text{logit}}\right)}}$$

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.