Untitled

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Input : $\vec{Y}$,**X**
Output: Posterior Samples of Regression Coeffiecents, $\vec{\beta}$ and $\vec{\gamma}$

```
Set Number of Samples (Total (N_s) and Burn-in)
n = Number of Observations
Initailize β⃗^(0) and γ⃗^(0) as the MLE
for k = 1 to N_s do
    Sample γ⃗_j from Uniform(max(max(Z_i : Y_i = j), γ_{j-1}^{(k-1)}, min(min(Z_i : Y_i = j + 1), γ_{j+1}^{(k-1)}))
    for i = 1 to n do
        Sample z_i^{(k)}|β⃗, γ⃗, y_i = j from truncN(x_i^T β^{(k-1)},1,γ_{j-1}, γ_j)
    end
    Set Σ = (X^T X)^{-1}
    Set β⃗_Z = ΣX^T Z
    Sample β^{(k)}|Z⃗, γ⃗, Y⃗ from N(β̂⃗_Z^{(k)}, Σ)
end
```

Algorithm 1: Ordered Multinomial Probit Regression Using Gibbs Sampler with Data Augmentation