Decoder Work

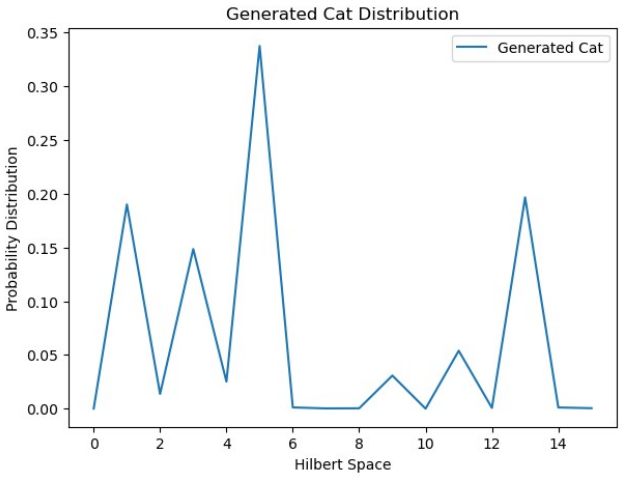
Target Distribution: Gaussian Distribution (4 qubits)
Leftover Distribution: Single Leftover Distribution (3 qcbm folds)
Expected Output Distribution: ‘10101010’

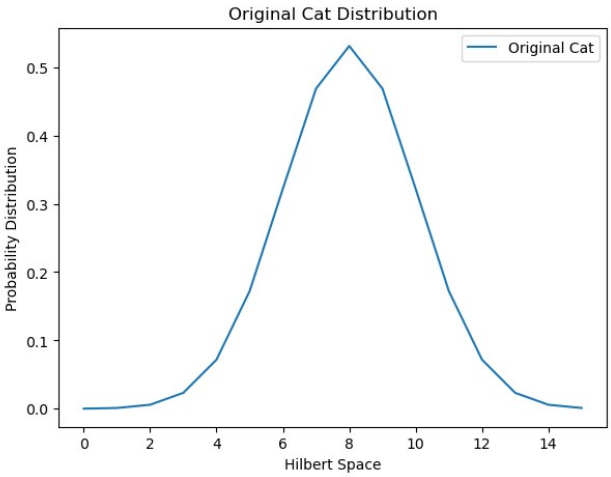
Case 1: VQC+QCBM = Ising Entangled Circuits

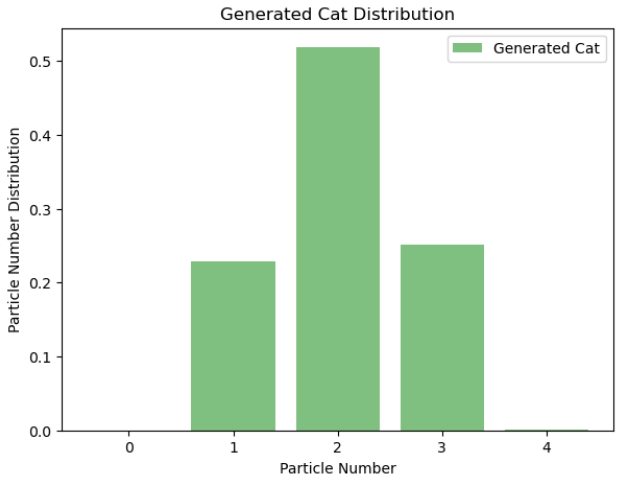
VQC = 3 folds (3 sets of Ising entanglement based gates)
QCBM = 3 folds

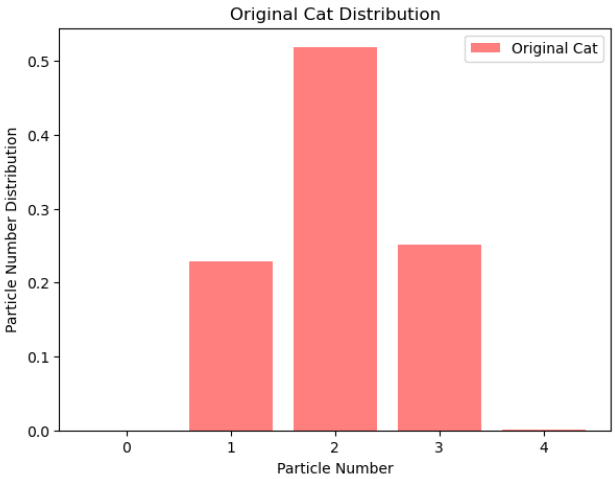
Pre-training = TRUE—Particle number distribution of target distribution

Results: The KL divergence of the model = 0.719





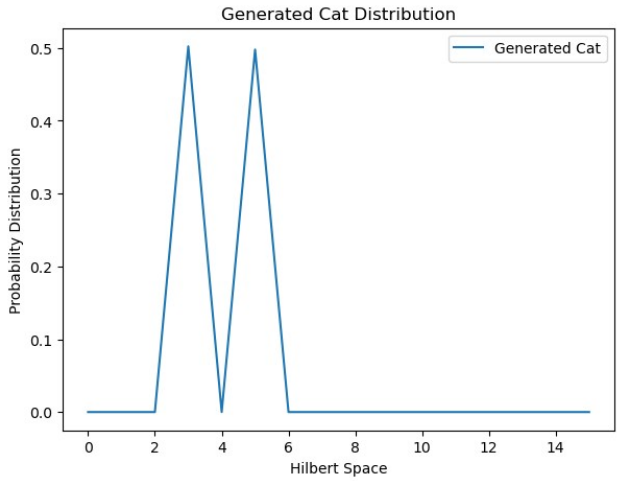


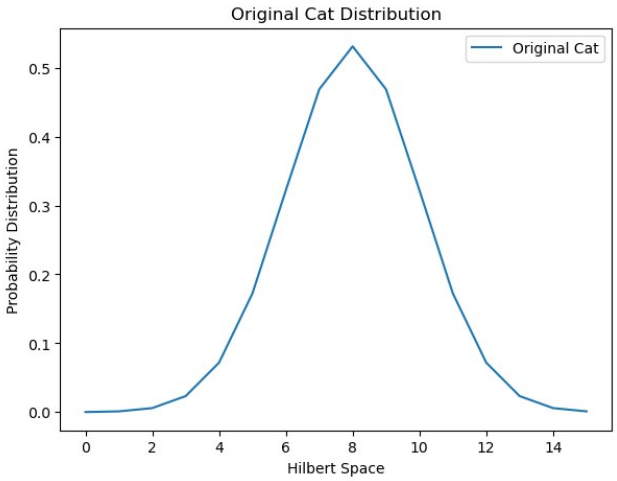


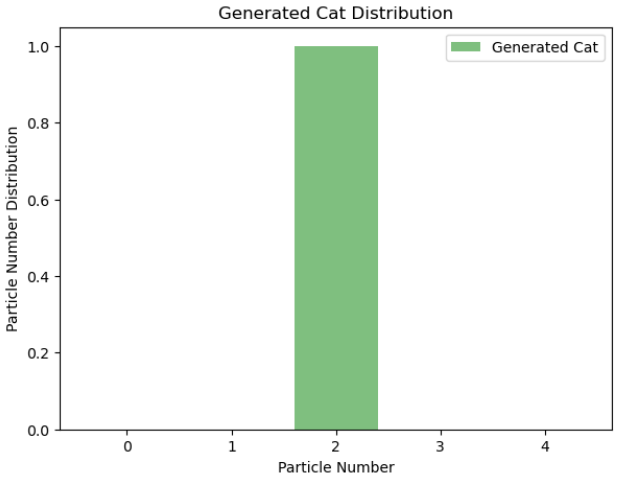
Case 2: VQC = Fully Entangled Circuit; QCBM = Ising Entangled Circuit

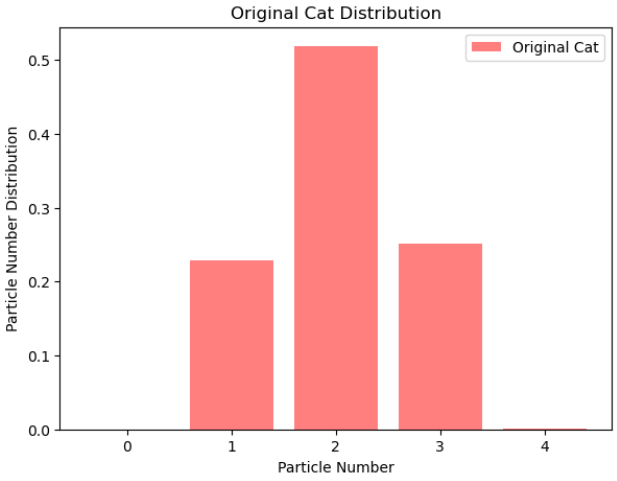
1. Pre-training = FALSE

Results: The KL divergence of the model = 0.429



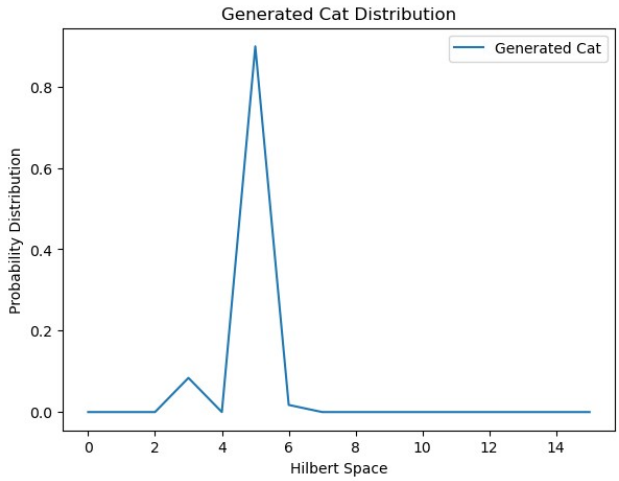


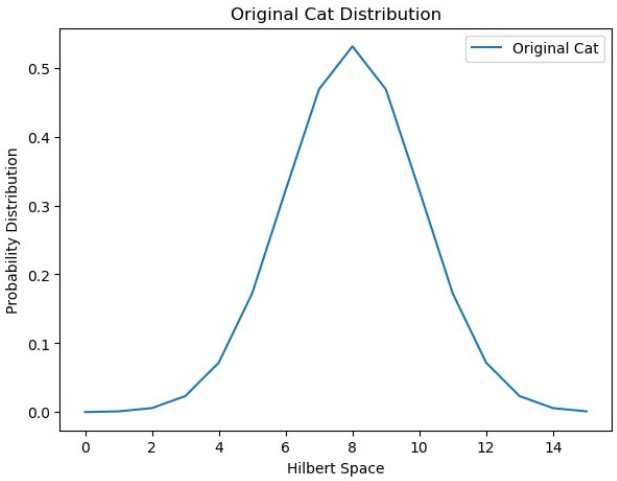


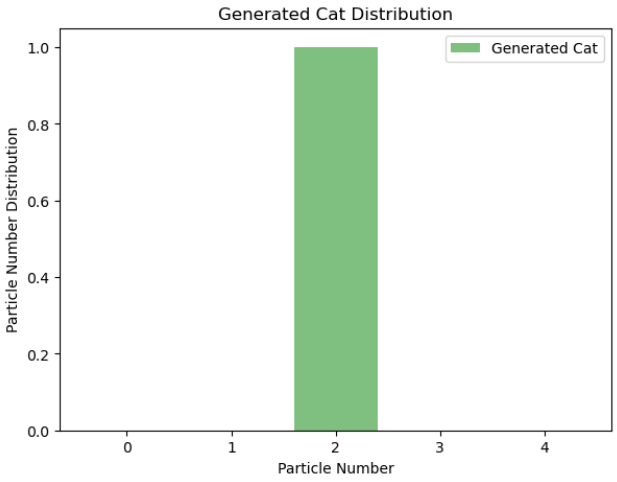


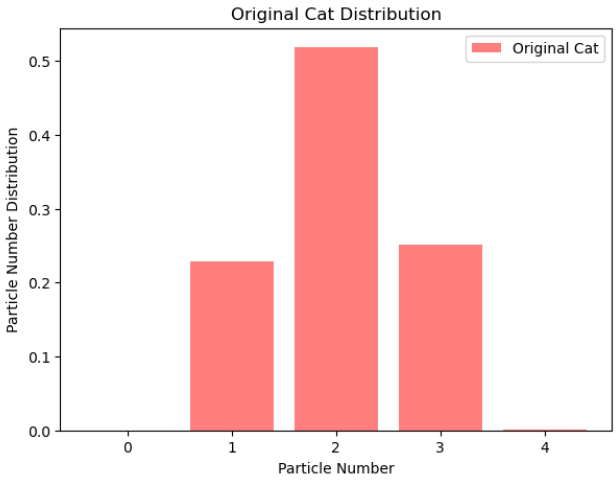
2. Pre-training = TRUE

Results: The KL divergence of the model = 0.429





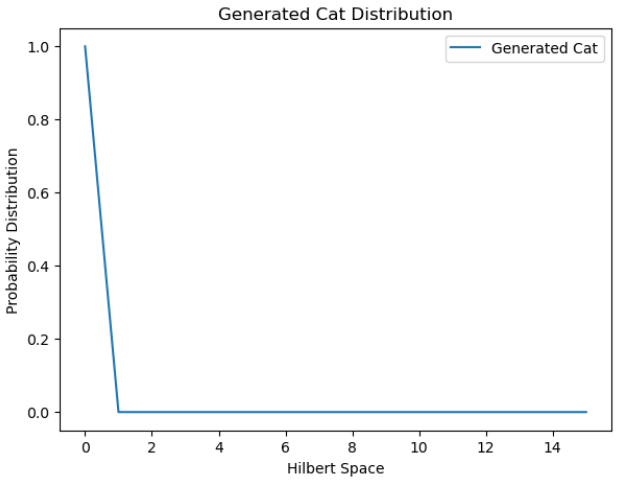


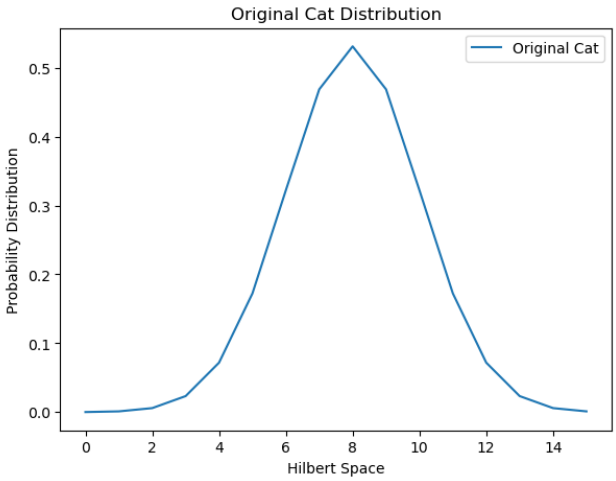


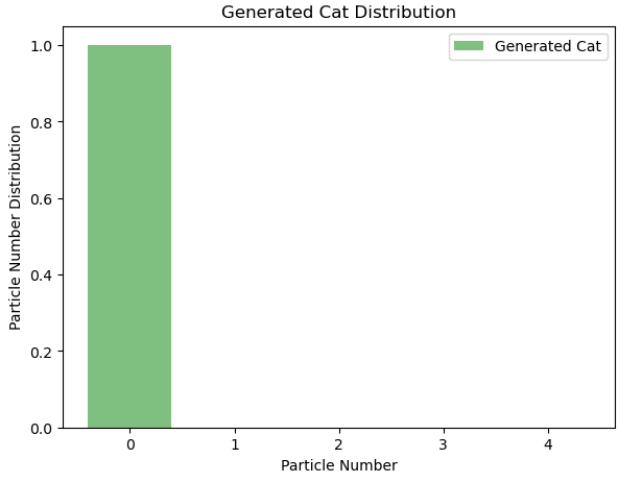
Case 3: VQC = Ising Entangling Circuit; QCBM = Fully Entangling Circuit

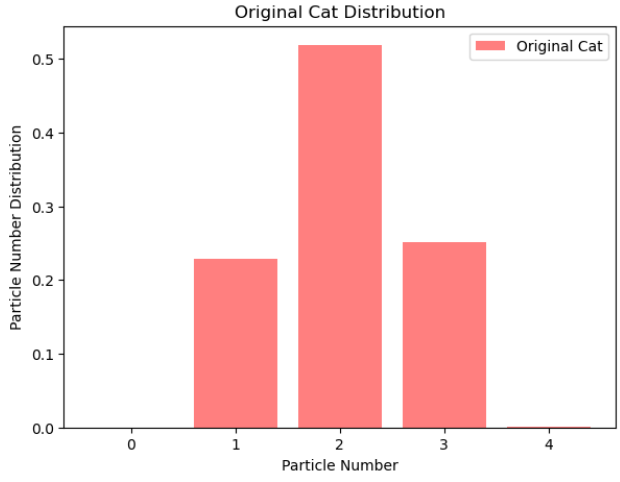
1. Pre-training = FALSE

Results: The KL divergence of the model = 0.817



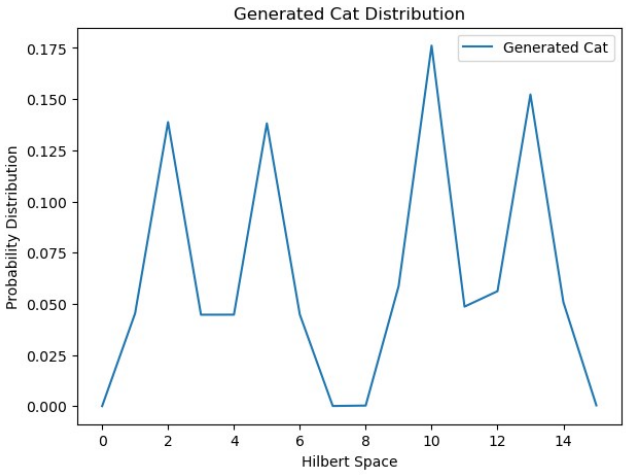


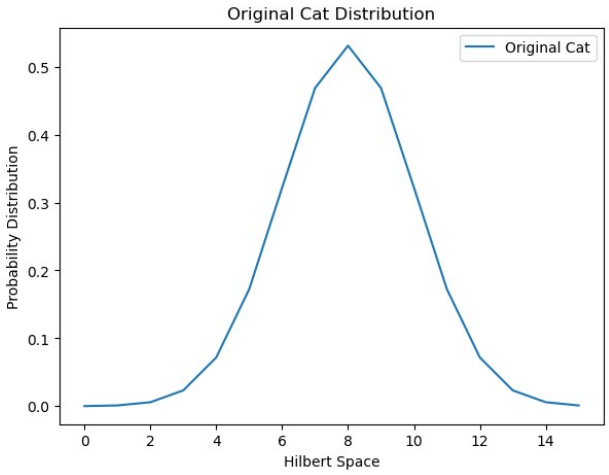


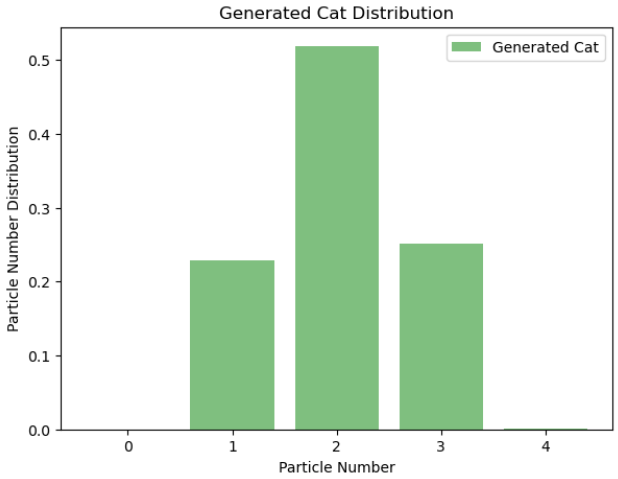


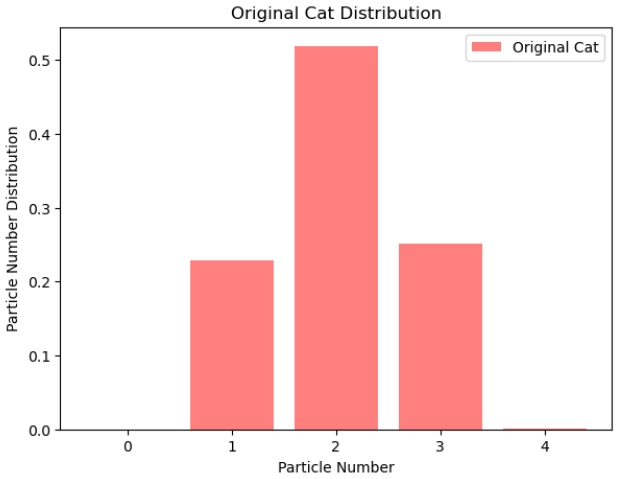
2. Pre-training= TRUE

Results: The KL divergence of the model: 0.210





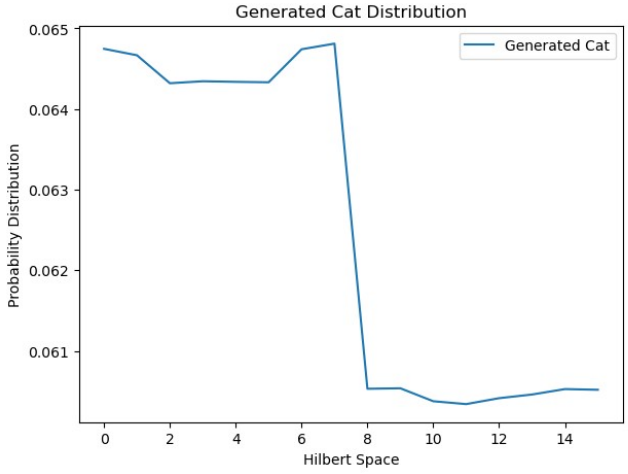


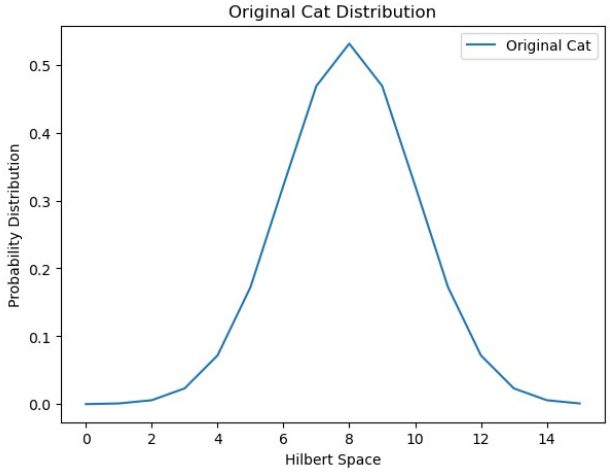


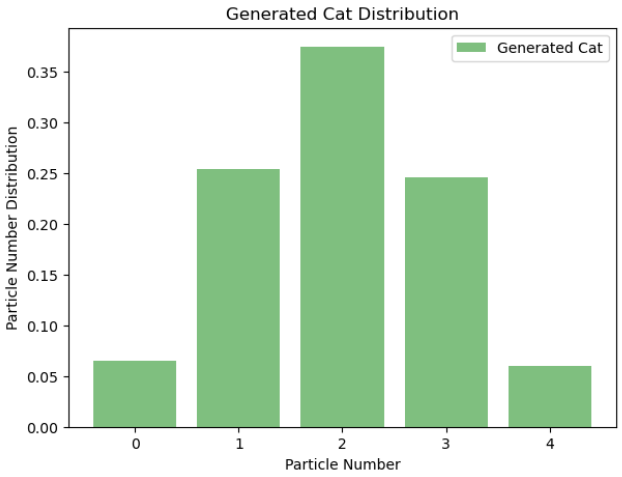
Case 4: VQC+QCBM = Fully Entangling Circuit

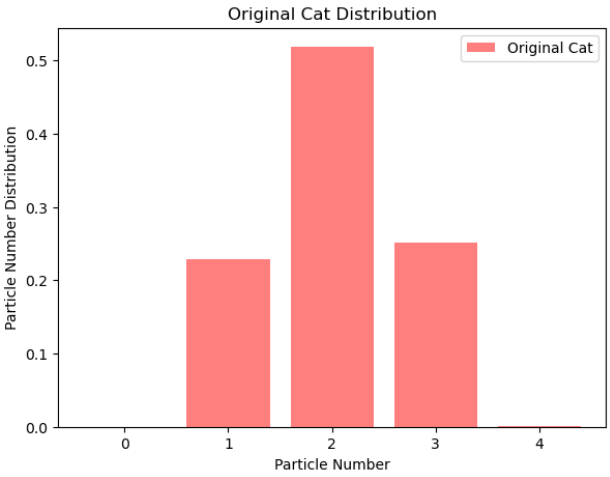
Pre-training = FALSE

Results: The KL Divergence of the model = 0.064









2. Pre-training = TRUE

Results: The KL divergence of the model = 0.066