Technion – Israel Institute of Technology



HW3

Autonomous Navigation and Perception

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# Theoretical questions

## Q1:

Consider two distributions & over random variables .

Prove that the KL divergence between these two distributions can be factorized as:

Proof:

## Q2:

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Steps:

1. Calculate
2. sample observations from probability distribution
3. From for each observation update belief
4. Calculate expectancy
5. Add calculated to the expectancy calculated in step 4.

Following the solutions above, we wrote an algorithm to compute , given that , which results in

Text, letter

Description automatically generated



Numerator:

Computing

Computing

Denominator:

Computing the denominator has the same computational complexity as in (2c)

Hence:

Since the algorithm runs over all the states,

Calculating the objective, we have:

Running over all observations: