A model has observations x and latent random variables z as well as parameters θ.

Text

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pθ(z) in this formula is called the **prior**

pθ(x|z) is called the **likelihood**.

Once we have specified a model, Bayes’ rule tells us how to use it to perform **inference**, or draw conclusions about latent variables from data, by computing the **posterior distribution** over z:

Diagram, text

Description automatically generated with medium confidence

to know how well a model fits observed data x, which we can quantify with the **evidence** or **marginal likelihood**

Text

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to make predictions for new data, which we can do with the **posterior predictive distribution**

Text

Description automatically generated with medium confidence

it is often desirable to **learn** the parameters θ of our models from observed data x, which we can do by maximizing the marginal likelihood:

