Probabilistic modeling is a type of statistical modeling that involves the use of probability theory to model real-world phenomena. In probabilistic modeling, the relationship between variables is described using probability distributions and the model parameters are estimated from data. This approach is particularly useful for modeling complex and uncertain phenomena, where a complete and accurate description of the relationship between variables is not possible.

Probabilistic models can take many forms, including linear regression models with normally distributed errors, Bayesian networks, Markov models, and Gaussian mixture models, among others. The choice of probabilistic model depends on the nature of the data, the research question being addressed, and the level of uncertainty in the system being modeled.

In probabilistic modeling, the focus is on estimating probabilities rather than making deterministic predictions. This allows for the incorporation of uncertainty in the model and the calculation of measures such as the probability of an event occurring or the credibility of a hypothesis.