

✓ Congratulations! You passed!

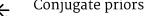
Since posterior lies in a known family of distributions, we will be able to perform analytical inference

Next Item

	1/1
*	point
1. Prior is said to be conjugate to a likelihood function if:	
	the posterior would stay in the same family of distributions as prior
Correct Posterior and prior are both distributions over $ heta$, so they can lie in the same family	
	the prior lies in the same family of distributions as the likelihood
	the prior, the likelihood function and the posterior would be in a same family of distributions
	the prior is from the same family of distributions as the likelihood
~	1/1 point
2. Finding a conjugate prior is useful because:	
	It leads to a better MAP estimate
Un-selected is correct	
	It is the only prior for which it is possible to perform analytical inference
Un-selected is correct	
	As long as posterior will stay in the same family with prior, the integral $p(x_{new} \mid x) = \int p(x_{new} \mid \theta) p(\theta \mid x) d\theta$ which is used for prediction is also tractable
Corr This	ect integral is called the evidence and it can be computed analytically if prior, likelihood and posterior are known
	We can perform analytical inference and find posterior distribution instead of taking point MAP estimate

V

1/1 point



Out of the following pairs of priors and likelihood functions, choose those that are conjugate: $\begin{array}{c} \textbf{Conjugate priors} \\ \hline & \Gamma(\lambda \mid \alpha, \beta) \text{ Prior Goves that are conjugate} \end{array}$

Correct

Multiplying these distribution and grouping the terms will lead to gamma distribution again

 $\mathcal{N}(\mu_1 \mid m, s^2)$ prior over parameter μ_1 for $\mathcal{N}(X \mid \mu_1, \sigma_1^2)$ likelihood

Correct

This example was discussed in a lecture

 $\Gamma(\sigma_1^2\,|\,lpha,eta)$ prior over parameter σ_1^2 of $\mathcal{N}(X\,|\,\mu_1,\sigma_1^2)$ likelihood

Un-selected is correct

 $\mathcal{N}(\sigma_1^2\,|\,m,s^2)$ prior over parameter σ_1^2 of $\mathcal{N}(X\,|\,\mu_1,\sigma_1^2)$ likelihood

Un-selected is correct



1/1 point

Which of the following prior distributions over parameter σ^2 are conjugate to likelihood $\mathcal{N}(x \mid \mu, \sigma^2)$?

 $Exp(\sigma^2\,|\,\lambda) = \lambda e^{-\lambda\sigma^2}$

Un-selected is correct

 $\mathcal{N}(\sigma^2\,|\,\mu_1,\sigma_1^2)$

Un-selected is correct

Inverse gamma with pdf $p(\sigma^2 \mid lpha, eta) = rac{eta^lpha}{\Gamma(lpha)(\sigma^2)^{-lpha-1} \exp\left(-rac{eta}{2}
ight)}$

Multiplying these distribution and grouping the terms will lead to normal distribution

Scaled inverse chi-squared with pdf $f(\sigma^2 \mid \nu, au) = rac{(au^2
u/2)^{
u/2} \exp\left(-rac{
u^2}{2
u^2}\right)}{\Gamma(
u/2) \quad (\sigma^2)^{1+
u/2}}$

Correct

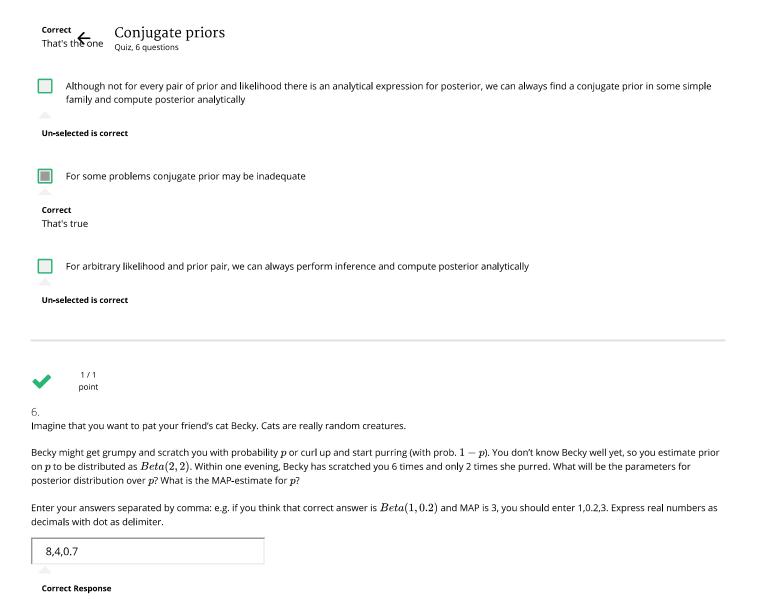
Multiplying these distribution and grouping the terms will lead to normal distribution



1/1 point

Choose the correct statements:

Putting initial knowledge into prior distribution is an advantage of Bayesian approach



Q = P