**Machine Learning Quiz**

**Bayesian Hypotheses Testing**

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1. What is a Bayesian A/B hypothesis testing test?

Bayesian A/B Testing employs Bayesian inference methods to give you ‘probability’ of how much A is better (or worse) than B. The immediate advantage of this method is that we can understand the result intuitively even without a proper statistical training.

1. What is the difference between a Bayesian hypothesis test and a traditional hypothesis test?

Traditional Hypothesis Testing:

In Traditional Hypothesis testing, we use p-values to choose between two hypotheses: the null hypothesis — that there is no difference between variants A and B — and the alternative hypothesis — that variant B is different. A p-value measures the probability of observing a difference between the two variants at least as extreme as what we actually observed, given that there is no difference between the variants. Once the p-value achieves statistical significance or we’ve seen enough data, the experiment is over.

Bayesian Hypothesis Testing:

In Bayesian A/B testing, we model the metric for each variant as a random variable with some probability distribution. Based on prior experience, we might believe that the conversion rate for a website has some range of possible values. By calculating the posterior distribution for each variant, we can express the uncertainty about our beliefs through probability statements.

1. What is the process to perform Bayesian hypothesis test?

In Bayesian Machine Learning, we try to infer the parameters ( θ ) of our model as .  
**P(**θ**/ D) = [P (D/**θ**) . P(**θ**)] /P(D)**

* P( θ) is the prior belief or in layman terms guess of the model parameters
* P(D/θ) is the likelihood of data D, given that θ is observed or true
* P(D) is just a normalizing constant

Bayesian Machine Learning gives us the probabilistic belief from a classifier.  
So, we basically:

1. Have a model or distribution.
2. Specify the prior belief we have about the parameters.
3. Observe the data
4. Compute posterior ( P(θ/D) - Probability Distribution of the model obtained)

Doing this for multiple models and see which model deems fit for your data.