Started on	Thursday, April 26, 2018, 4:00 PM
State	Finished
Completed on	Thursday, April 26, 2018, 4:16 PM
Time taken	15 mins 35 secs
Grade	**60.00** out of 60.00 (**100**%)

Question 1

Complete

4.00 points out of 4.00

What function in the PyMC3 library can we use to display the summary statistics for the traces as well as visualize the traces and their kernel density estimates?

Select one:

- ○ a. traceplot
- ⦿ b. summary
- ○ c. regplot
- ○ d. plot

Question 2

Complete

4.00 points out of 4.00

According to the reading on "Bayesian Inference with PyMC3", which of the following is not an example of traditional statistics?

Select one:

- ○ a. Generalized Linear Models
- ⦿ b. Random Forests
- ○ c. Linear Compression
- ○ d. Decision Trees

Question 3

Complete

4.00 points out of 4.00

Which sampler would be automatically assigned to the PyMC3's step_methods submodule, given continuous variables?

Select one:

- ○ a. BinaryMetropolis
- ⦿ b. NUTS
- ○ c. Slice
- ○ d. Metropolis

Question 4

Complete

4.00 points out of 4.00

According to the Domino labs article, which of the following terms refers to the class of algorithms used for sampling probability distributions, the methods of which construct an equilibrium distribution possessing attributes of the desired distribution?

Select one:

- ⊙ a. Markov Chain Monte Carlo
- ○ b. Hierarchical Modeling
- ○ c. Hidden Markov Model
- ○ d. Quasi-Monte Carlo

Question 5

Complete

4.00 points out of 4.00

According to wikipedia, how is the linear predictor related to the expected value of the data?

Select one:

- ○ a. through the fitting function
- ○ b. through the dispersion parameter
- ○ c. through the density function
- ⊙ d. through the link function

Question 6

Complete

4.00 points out of 4.00

What kind of data structure refers to instances in which each observation is a member of a group, and group membership is believed to have an important effect on the outcome of interest?

Select one:

- ○ a. independent data
- ⊙ b. nested data
- ○ c. mess data
- ○ d. non-nested data

Question 7

Complete

4.00 points out of 4.00

According to wikipedia, what is the expression of a logit link function?

Select one:

- ○ a. $\mathbf{X}\beta = \mu$
- ⊙ b. $\mathbf{X}\beta = \ln\left(\dfrac{\mu}{1-\mu}\right)$
- ○ c. $\mu = \exp(\mathbf{X}\beta)$
- ○ d. $\mathbf{X}\beta = \ln(\mu)$

Question 8

Complete

4.00 points out of 4.00

In frequentist statistics we assume that the parameters of interest are not fixed constants.

Select one:

- ○ a. Yes
- ⦿ b. No

Question 9

Complete

4.00 points out of 4.00

What function in the PyMC3 library can be used to find a good place from which to start sampling for the MCMC sampler?

Select one:

- ○ a. find_start
- ○ b. sample
- ○ c. MAP
- ⦿ d. find_MAP

With the PyMC3 library, how can we fit a model using the given formula named "formula" about the variables in the given data named "data"?

```
import pymc3 as pm
```

Select one:

- a.

```
with pm.Model() as model_glm:
    pm.glm.GLM.from_formula('y~x', data)
```

- b.

```
with pm.Model() as model_glm:
    pm.glm.GLM.from_formula('y~x', df)
```

- ⦿ c.

```
with pm.Model() as model_glm:
    pm.glm.GLM.from_formula(formula, data)
```

- d.

```
with pm.Model() as model_glm:
    pm.glm.GLM(formula, data)
```

Question 11

Complete

4.00 points out of
4.00

Within the PyMC3 library, how can we get all except first 500 values of "intercept"
variable in a trace object named "hierarchical_trace"?

Select one:

○ a.

```
hierarchical_trace['intercept'][500:]
```

○ b.

```
hierarchical_trace['Intercept'][-n_burn:]
```

○ c.

```
hierarchical_trace['intercept'][:500]
```

○ d.

```
hierarchical_trace['intercept'][-n_burn:]
```

Question 12

Complete

4.00 points out of
4.00

According to wikipedia, in statistics, the _____ is a flexible generalization of
ordinary linear regression that allows for response variables that have error
distribution models other than a normal distribution.

Select one:

○ a. hierarchical linear model

○ b. regressive linear model

○ c. general linear model

⦿ d. generalized linear model

Question 13

Complete

4.00 points out of 4.00

Complete the following sentence about one key difference between Frequentist statistics and Bayesian statistics:

In Bayesian statistics _____ is calculated, while in frequentist statistics the calculation is performed for _____.

In the choices below, P and D stand for Parameter and Data, respectively.

Select one:

- ⦿ a. Prob(P | D) ; Prob(D | P)
- ◯ b. Prob(D | P); Prob(D | P)
- ◯ c. Prob(D | P); Prob(P | D)
- ◯ d. Prob(P | D); Prob(P | D)

Question 14

Complete

4.00 points out of 4.00

Complete the following sentence:

The trace object returned by the sample function in the PyMC3 library can be queried in a similar way to a _____containing a map from variable names to numpy.arrays.

Select one:

- ◯ a. list
- ◯ b. tuple
- ◯ c. set
- ⦿ d. dictionary

Question 15

Complete

4.00 points out of 4.00

What samplers does PyMC3's step_methods submodule contain ?

Select one or more:

- ☑ a. HamiltonianMC
- ☑ b. BinaryMetropolis
- ☑ c. NUTS
- ☑ d. Slice