Federated Learning CIE Unit 1 2 3

Total points 22/30

B.Tech AI-DS

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✓ Q-1 Which type of heterogeneity is considered most prominent while optimizing federated learning algorithms *2/2

1) Data
2) Process
3) Algorithm
4) Variables

- (●) a) Only 1 ✓
- ( ) b) Both 1 and 2
- ( ) c) All of these
- ( ) d) None of these

✓ Q-2. In the realm of Federated Learning, which types of data needs to be processed. *2/2

1) identically and independently distributed data
2) identically and non-independently distributed data
3) non-identical and independently distributed data
4) non-IID data identically and independently distributed data

- a) Only 1
- b) Both 1 and 4
- c) Only 4 ✓
- d) None of these

✓ Q-3. While dealing with Federated Systems, following issues need to be taken care of *2/2

1) Limited communication
2) Unbalanced contribution
3) Privacy
4) Security

- a) Both 1 and 2
- b) Both 2 and 3
- c) All of these ✓
- d) None of these

*2/2

Q-4. While dealing with Federated Systems, following can help in minimizing the objective function

1) Gradient Descent (GD)
2) Random Forest
3) Clustering
4) Categorization

- [x] a) Only 1
- [ ] b) Both 1 and 2
- [ ] c) All of these
- [ ] d) None of these

*2/2

Q-5. Which of the following are considered as a Hyper parameter while optimizing FL systems.

1) Local Training Steps
2) Global Training Steps
3) Objective function
4) Class of neural networks

- [x] a) Only 1
- [ ] b) Both 1 and 2
- [ ] c) Both 3 and 4
- [ ] d) None of these

✓ Q-6 The tree-based models are a class of machine learning algorithms that utilize _____
data structures

*2/2

1. Tree based
2. Graph based
3. linear search based
4. Binary search based data structure

- (●) a) Only a ✓
- ( ) b) Both a and b
- ( ) c) depends on different architectures
- ( ) d) depends on different types of OS

✓ Q-7. The Party-Adaptive XGBoost (PAX) is a variant of which of the following ML algorithms

*2/2

a. Boost
b. XGBoost
c. AGBoost
d. Random Forest

- ( ) 1. both A and C
- (●) 2. Only B ✓
- ( ) 3. Both A and D
- ( ) 4. Only D

✓ Q-8. At a very basic level, Conversion of _____ into numeric representation is known as vector *2/2

1. Paragraphs
2. Sentences
3. Words
4. documents

- a) 2 and 4
- b) 2 and 3
- c) only 1
- d) only 3 ✓

✓ Q-9. Doc2vec helps in the implementation of _____ * 2/2

1. Vector Space Mapping
2. Vector Based Sillogism
3. Vector based division
4. Vector based operations

- a) 2 and 4
- b) 2 and 3
- c) only 1 ✓
- d) None of these

✗ *0/2

Q-10. Which one of the following form first steps towards personalizing federated learning

1. Fine-Tuning Global Model for Personalization
2. Federated Averaging as a First-Order Meta-learning Method
3. Fine-Tuning local Model for personalized training
4. Federated Averaging as a All-Order Meta-learning Method.

- (●) a) All of the above ✗
- ( ) b) None of these
- ( ) c) Both 1 and 2
- ( ) d) Both 3 and 4

✓ Q-11 Which of the following statements are true with respect to Centralized and Decentralized FL systems. *2/2

1. Centralized systems performance is slower as compared to Decentralized FL systems.

2. There is more chance of single point of failure with centralized system as compared to
decentralized FL systems.

- ( ) a) 1 only
- ( ) b) 2 only
- (●) c) All of the above ✓
- ( ) d) None of the above

✗ Q-12. Variations to FedAvg alogrithm have been proposed due to following reasons:- *0/2

1. For improving aggregation of model updates in federated learning.

2. For performing latest IT related operations in FL.

3. For improving architectures of FL systems.

- ○ a) 1 only
- ○ b) 1 & 2
- ○ c) 2 & 3
- ◉ d) all of the above ✗

✗ Q-3. The following are categories of FL systems * 0/2

a) Horizontal Federated Learning System
b) Vertical Federated Learning System
c) Horizontal, Vertical, Federated Transfer Learning system
d) Functional Transfer learning

- ○ 1. a only
- ◉ 2. a and b ✗
- ○ 3. a and d
- ○ 4. c only

✗ Q-4. Which of the following is the best definition of Federated Transfer Learning *0/2

a) Federated Transfer Learning applies to the scenarios that the two data sets differ not only in samples but also in feature space.

b) Federated Transfer Learning applies to the scenarios that the two homogenous data sets differ not only in samples but also in feature space.

c) Federated Transfer Learning applies to the scenarios that the three data sets differ not only in samples but also in feature space.

d) Federated Transfer Learning applies to the scenarios that the any number of data sets differ not only in samples but also in feature space.

- 1. a only
- 2. a and b
- 3. a and d
- 4. d only ✗

✓ Q-5 Which of the following is an application of Federated Learning systems. *2/2

a) Smart health
b) Multi-party database querying
c) Smart salary
d) Smart payments

- 1. a only
- 2. b only
- 3. both a and b ✓
- 4. None of these