



# DATA MINING (Week 4)

# DSBA CURRICULUM DESIGN

## FOUNDATIONS

Data Science Using  
Python

Statistical Methods  
for Decision Making

## CORE COURSES

Advanced  
Statistics

Data Mining  
(Week-4/6)

Predictive Modelling

Machine Learning

Time Series  
Forecasting

Data Visualization

## DOMAIN APPLICATIONS

Financial Risk  
Analytics

Web & Social Media  
Analytics

Marketing Retail  
Analytics



# LEARNING OBJECTIVE OF THIS MODULE

- Clustering
- CART & Model Performance Measures
- Random Forest
- Neural Network

# LEARNING OBJECTIVES OF THIS SESSION

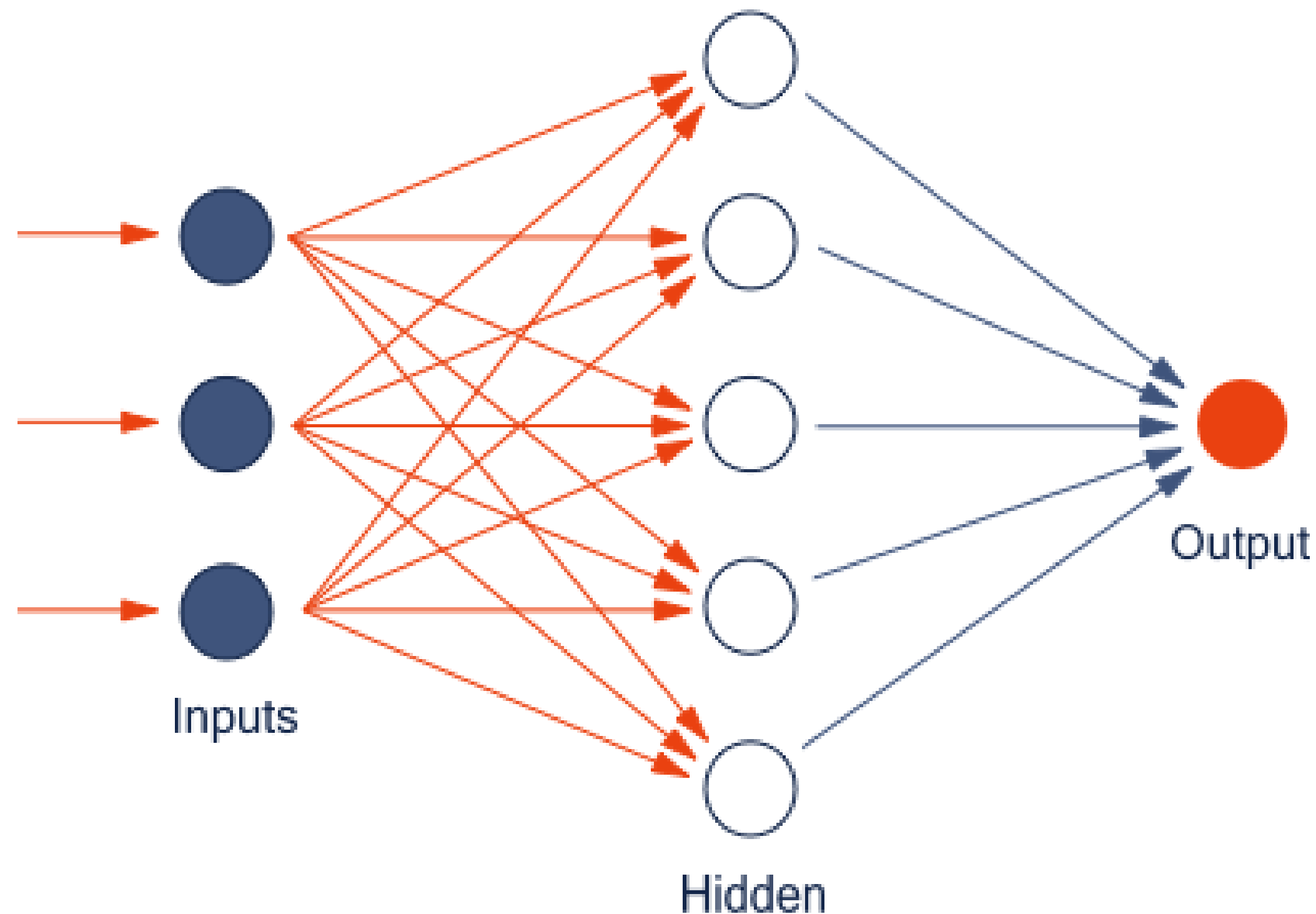
- Single-layer/Multi-layer Network
- Different types of Activation Function
- Neural Network Algorithm

# TRY ANSWERING THE FOLLOWING

- Name a few Activation Functions.
- Name the three main layers in Neural Network Architecture.
- What are the cons of having high learning rates?



# BROAD OVERVIEW- Neural Networks





## Industry Application - Not just the best coffee

Starbucks has been credited with revolutionizing the coffee industry. Starbucks Rewards is often regarded as one of the best retail loyalty programs in existence

Starbucks has used Artificial Neural Networks and targeted marketing to keep customers engaged with their app. The company has integrated its rewards system location and purchase history on their app. This allows them to offer an incredibly personalized experience, helping to increase the revenue by \$2.56 billion.

**Reference:** <https://blog.smile.io/loyalty-case-study-starbucks-rewards>



TM

## Industry Application - Saving time and money on Travel Insurance

Allianz Travel Insurance adopted a system powered by Artificial Neural Networks. Their systems analyses a number of factors such as trip length, cost, the traveler's age and reason for travel if you are paying with air miles.

For example a trip booked on the day of departure makes cancellation coverage unnecessary. Customers who don't need cancellation coverage can purchase a product that only covers post-departure travel problems such as travel delay, delayed or lost baggage or medical emergencies. That can result in cost savings to the customer, potentially offering a product that is 30% cheaper than comparable products offering cancellation coverage.

Allianz used such information to identify the best product for the customer. This not only ensures that the customer gets the most relevant coverage but it also reduces the time spent searching and researching.

**Reference :** <https://www.forbes.com/sites/christopherelliott/2019/04/21/in-travel-insurance-machine-learning-is-turning-conventional-wisdom-on-its-head/#4151ac334eb7>





## CASE STUDY - Customer Churn

Customer churn and engagement has become one of the top issues for most banks. It costs significantly more to acquire new customers than retain existing. It is of utmost important for a bank to retain its customers.

We have a data from a MeBank (Name changed) which has a data of 7124 customers. In this data-set we have a dependent variable “Exited” and various independent variables.

Based on the data, build a model to predict when the customer will exit the bank. Split the data into Train and Test dataset (70:30), build the model on Train data-set and test the model on Test-dataset. Secondly provide recommendations to the bank so that they can retain the customers who are on the verge of exiting.



**ANY QUESTIONS**



**HAPPY LEARNING**