Course: SAS Based Mini project 2	SVTA, INTN, DLUS
Course: Visual Forecasting Using SAS, Optimization concepts for Dsci and Artifical Intelligence	FVVF, ORVY

SAS Visual Text Analytics in SAS Viya - SVTA

SAS Visual Text Analytics enables you to uncover insights hidden within unstructured data using the combined power of natural language processing, machine learning, and linguistic rules. This course explores the five components of Visual Text Analytics: parsing, concept derivation, topic derivation, text categorization, and sentiment analysis. Documents are parsed and analyzed to reveal dominant themes in the document collection. Sophisticated linguistic queries are constructed to satisfy specific information needs. An integrated solution is developed using information extracted from subject matter expert rules, combined with machine learning results for model and rule-based topics and categories. The course includes hands-on use of SAS Viya in a distributed computing environment.
The e-learning course covers SAS Visual Text Analytics 8.4 or 8.5 in SAS Viya.

Learn how to

- Use the point-and-click interface of Model Studio and SAS Visual Text Analytics.
- Explore collections of text documents to discover key topics.
- Interpret term maps.
- Identify key textual topics automatically in your large document collections.
- Create robust models for categorizing the content according to your organization's specific needs.
- Create, modify, and enable (or disable) custom concepts and test linguistic rule definitions with validation checks within the same interactive GUI.
- Extract individual instances of concepts from within documents.
- Create custom Boolean rules to categorize documents with respect to a categorical target variable.
- Modify automatically generated Boolean category rules.
- Extract a document-level sentiment score.
- Create modeling-ready data for use by SAS Visual Data Mining and Machine Learning.
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Who should attend
Text analysts, business and marketing analysts, web analysts, BI professionals, customer intelligence professionals, social media analysts, and document librarians

Prerequisites
Neither SAS programming experience nor statistical knowledge is required. You should be comfortable using a computer, have experience using browser-based software solutions, and have a basic understanding of the differences between structured (numeric) and unstructured (text) data fields.

Software Addressed
SAS Visual Text Analytics

Course Contents
Introduction to SAS Visual Text Analytics

- Introduction.
- Language challenges (self-study).

SAS Visual Text Analytics Demonstrations

- Importing document collections.
- Creating a project with no predefined concepts.
- A project with custom concepts.

SAS Visual Text Analytics Nodes

- Introduction.
- Concepts and terms.
- Machine-generated topics.
- Categories.
- Scoring new documents.

Concept and Category Rule Definitions

- SAS Visual Text Analytics rules.
- SAS Visual Text Analytics concept rules.
- SAS Visual Text Analytics demo category rules.

Case Studies

- Retrieving information and documents about anxiety and depression from drug reports.
- Automatic categorization of ASRS incident reports.
- Retrieving mortgage complaints from the CFPB customer complaints data (self-study).

Neural Networks: Essentials - INTN

This course combines theory and practice to immerse you in the core concepts of neural network models and the essential practices of real-world application. During the course, you programmatically build a neural network and discover how to adjust the model?s essential parameters to solve different types of business challenges. You implement early stopping, build autoencoders for a predictive model, and perform an intelligent automatic search of the model hyperparameter values. The last lesson introduces deep learning. You gain hands-on practice building neural networks in SAS 9.4 and the cutting-edge, cloud-enabled in-memory analytics engine for big data analytics, SAS Viya.

Learn how to

- Programmatically build neural networks in SAS 9.4 and SAS Viya.
- Modify neural networks' parameters for better performance.
- Conduct automatic search for neural networks' hyperparameters through genetic algorithm.
- Enhance data with autoencoders and synthetic observations.

Who should attend
Those interested in learning about neural networks, general machine learning and data science techniques, and SAS software.

Prerequisites
Before taking this course, you should have the following:

- Some familiarity with programming in SAS or SQL (or both).
- An understanding of predictive modeling.
- A basic understanding of calculus.

Software Addressed
SAS Viya

Course Contents
Neural Networks: Essentials

- Introduction.
- Multilayer perceptrons.
- Neural network modeling paradigm.
- Using a surrogate model to interpret neural network predictions.
- Other considerations.

Neural Network Details

- Parameter estimation.
- Numerical optimization methods.
- Regularization.
- Unbalanced data.
- SAS search optimizations (self-study).

Tuning a Neural Network

- Selecting hyperparameters with autotuning.

Introduction to Deep Learning

- Introduction to deep learning.
- Autoencoders.

Radial Basis Function Networks (Self-Study)

Deep Learning Using SAS Software- DLUS

This course introduces the pivotal components of deep learning. You learn how to build deep feedforward, convolutional, recurrent networks, and variants of denoising autoencoders. The neural networks are used to solve problems that include traditional classification, image classification, and sequence-dependent outcomes. The course contains a healthy mix of theory and application. Hands-on demonstration and practice problems are included to reinforce key concepts. Hyperparameter search methods are described and demonstrated to find an optimal set of deep learning models. Transfer learning is covered because the emergence of this field has shown promise in deep learning. Lastly, you learn how to customize a SAS deep learning model to research new areas of deep learning.

Learn how to

- Define and understand deep learning.
- Build models using deep learning techniques.
- Apply models to score (inference) new data.
- Modify data for better analysis results.
- Search the hyperparameter space of a deep learning model.
- Leverage transfer learning using supervised and unsupervised methods.
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Who should attend
Machine learners and those interested in deep learning, computer vision, or natural language processing

Prerequisites
Before attending this course, you should have at least an introductory-level familiarity with basic neural network modeling ideas. You can gain this neural network modeling knowledge by completing either the *Neural Networks: Essentials* or *Neural Network Modeling* course.

Software Addressed
SAS Visual Data Mining and Machine Learning, SAS Viya

Course Contents
Introduction to Deep Learning

- Introduction to neural networks.
- Introduction to deep learning.
- ADAM optimization.
- Dropout.
- Batch normalization.
- Autoencoders.
- Building level-specific autoencoders (self-study).

Convolutional Neural Networks

- Applications.
- Input layers.
- Convolutional layers.
- Padding.
- Pooling layers.
- Traditional layers.

- Types of skip-layer connections.
- Image pre-processing and data enrichment.
- Training convolutional neural networks.

Recurrent Neural Networks

- Introduction.
- Recurrent neural networks overview.
- Sub-types of recurrent neural networks.
- Time series analysis using recurrent neural networks.
- Sentiment analysis using recurrent neural networks.

Tuning a Neural Network

- Selecting hyperparameters.
- Hyperband.

Additional Topics

- Types of transfer learning.
- Transfer learning basics.
- Transfer learning strategies.
- Transfer learning with unsupervised pretraining.
- Customizations with FCMP.

Forecasting Using Model Studio in SAS Viya - FVVF

This course provides a hands-on tour of the forecasting functionality in Model Studio, a component of SAS Viya. The course begins by showing how to load the data into memory and visualize the time series data to be modeled. Attribute variables are introduced and implemented in the visualization. The course then covers the essentials of using pipelines for generating forecasts and selecting champion pipelines in a project. It also teaches you how to incorporate large-scale forecasting practices into the forecasting project. These include the creation of data hierarchies, forecast reconciliation, overrides, and best practices associated with forecast model selection.

Learn how to

- Automatically create and fit custom forecast models using structured analytic workflows or pipelines.
- Visualize modeling data using attribute variables.
- Refine forecast models to improve forecast accuracy.
- Apply overrides-generated forecasts.
- Generate forecast data sets for deployment.
- Build and share custom pipelines for large-scale forecasting analyses.
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Who should attend
Forecasters and analysts in any industry, including retail, financial services, manufacturing, and pharmaceuticals

Prerequisites
Before attending this course, you should be familiar with applied forecasting concepts. You do not need formal training in statistics to benefit from this course. Programming experience is also not required.

Software Addressed
SAS Visual Forecasting

Course Contents

Introduction and Data Visualization

- SAS Drive overview.
- Creating a forecasting project and loading the data.
- Visualizing the modeling data using attribute variables.

Pipeline Essentials

- Definition and creation of a time series.
- Fundamental concepts in time series modeling.
- Classes of time series models
- Model comparison using honest assessment.
- Pipeline templates and pipeline comparison.

Hierarchical Forecasting

Post-forecasting Functionality

- Overrides and exporting generated tables.

In-Line Code Access and Overview (Appendix)

- Code overview.

Optimization Concepts for Data Science and Artificial Intelligence - ORVY

This course focuses on linear, nonlinear, and mixed integer linear optimization concepts in SAS Viya. Students learn how to formulate optimization problems and how to make their formulations efficient by using index sets and arrays. The demonstrations in the course include examples of diet formulation and portfolio optimization. Learn the OPTMODEL procedure and open source tools to formulate and solve optimization problems.

Learn how to

- Identify and formulate appropriate approaches to solving various linear, mixed integer linear, and nonlinear optimization problems.
- Create optimization models commonly used in industry.
- Solve optimization problems using the OPTMODEL procedure in SAS.

Who should attend
Those who want to develop the optimization foundation necessary to work as a data scientist, especially those with a strong background in applied mathematics

Prerequisites
Before enrolling in this course, you should be comfortable with data manipulation using basic SAS tools. You can gain this course-specific knowledge in data manipulation by completing the *SAS Programming 1: Essentials* course. Some knowledge of linear programming concepts and matrix algebra is helpful but is not required.

Course Materials
Registered students will be able to download the course materials from the Web prior to the class. These materials may include a .pdf copy of the course notes, a .pdf copy of the course workbook, and exercise files.

Software Addressed
SAS Optimization

Course Contents
Introduction to Mathematical Optimization
- Introduction.
- A simple example.
- The OPTMODEL procedure.

Linear Programming
- Introduction to linear programming.
- Formulating and solving linear programming problems using the OPTMODEL procedure.
- Using index sets and arrays in the OPTMODEL procedure.
- Dual values and reduced costs in the simplex method (self-study).
- Reading and writing data in the OPTMODEL procedure.

Nonlinear Programming
- Introduction to nonlinear programming.
- Solving nonlinear programming problems using the OPTMODEL procedure.

Integer and Mixed Integer Linear Programming
- Introduction to integer and mixed integer linear programming.
- Solving integer and mixed integer linear programming problems using PROC OPTMODEL.

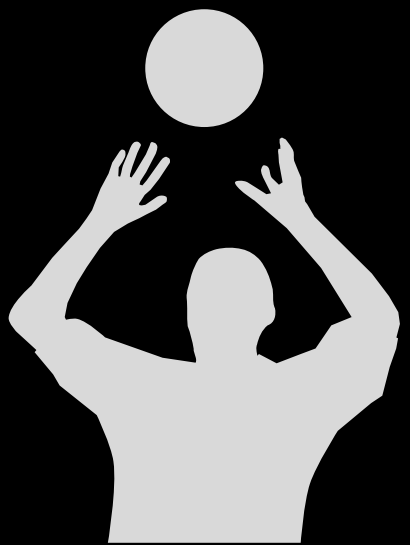
Open Source Interactivity
- SAS Viya and open source integration
- SAS Viya Python APIs.

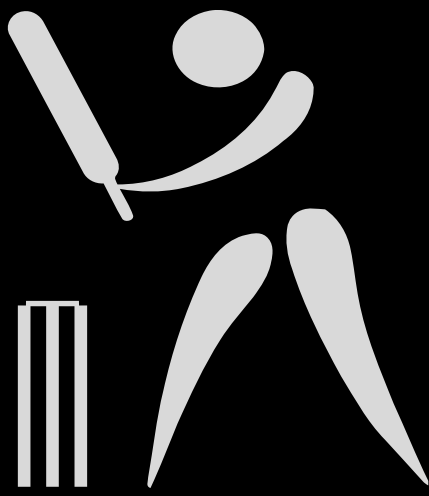
PROGRAMME REPORT

TRAINING PROGRAMME DA-IICT

DESCRIPTION

- The training program at DA-IICT consists of 10 teams participating in training and yoga exercises conducted by coaches of their respective sports
- The following teams have participated and completed the training programme
  - Cricket
  - Badminton
  - Table Tennis
  - Football
  - Lawn Tennis
  - Volleyball
  - Basketball
  - Athletics
- Programme Duration: 30+ hrs





CRICKET

- *strength training exercises*
- *cricket coaching*
- *Compulsory for all the team members to participate*

BADMINTON

- *mobility exercises, stretching exercises*
- *lower limb endurance training*
- *badminton coaching*
- *Compulsory for all the team members to participate*

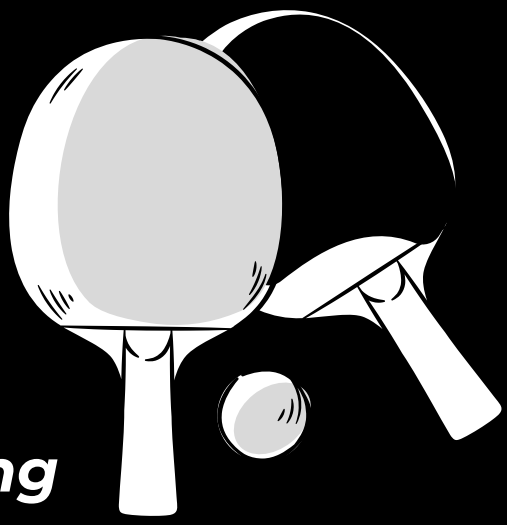


TABLE TENNIS

- *High Intensity interval training*
- *Compulsory for all the team members to participate*

FOOTBALL

- *Agility Exercises*
- *Medicine Ball Pushups*
- *Lateral Hurdle Sprints*
- *Forward and Backward Sprints*
- *Compulsory for all the team members to participate*

LAWN TENNIS

- *Strength and Muscle Phase*
- *Strength Training*
- *Compulsory for all the team members to participate*

BASKETBALL

- *Endurance training and coaching sessions*
- *Compulsory for all the team members to participate*

VOLLEYBALL

- *Focused weight training, such as squats and lunges, and various types of abdominal crunches, including forms of Swiss ball training*
- *Stretching and flexibility exercises*
- *Aerobic fitness*
- *Compulsory for all the team members to participate*

ATHLETICS

- *Core Stability*
- *Compulsory for all the team members to participate*

OUTCOMES

- ***Fitness of all the team members is regularly maintained***
- ***Oppurtunity for all the other students to join and learn the sport***
- ***Performance in Inter College tournaments and state level tournaments has improved***
- ***Discipline is introduced in team members' routine.***
- ***More participation from the student community***

Managed by: Sports Committee, DA-IICT

Chess Course

Description: Chess is a classic two player strategy game, with numerous variants. This course aims to facilitate players who are rank-beginners to learn some facets of chess that will elevate them to the next level. Chess, unlike say tic-tac-toe, is a fairly complex (even if finite) strategy game, so the spectrum of player levels is really wide. It is difficult, if not impossible, to design a course on chess that will benefit players of all levels. Thus, this course specifically caters to rank-beginners and for players of a higher calibre, a different course must be designed. Even books by the greatest masters cannot collapse the wide spectrum of player levels and cater to everyone. This course, however, assumes that the students know the basic rules. If not, this can be incorporated, by a preparatory session of one or two hours.

Aims: Here, we describe some aspects of chess. Although chess is often associated with mathematics, this might miss the point. The main difference is, in chess you don't need to be correct. In order to win, you just need to be more correct than the opponent. In this sense, it is more appropriate to compare chess to the legal profession. The advocate usually (if not always) defends their client, no matter the merits. Likewise, if you are playing chess you need to do your best at each point, with the current configuration of your army. You do not surrender, merely because your opponent's army is currently superior. However, when the superiority becomes overwhelming, it makes sense to surrender. What is overwhelming is dictated by the calibre of the players involved in the game.

Objective: Chess is a game that can be enjoyed, without bothering about acquiring expertise. However, even if one is not a super-talent, one can enjoy the game more, if one raises the level to an extent. One approach is to start playing in the hope that playing a lot will automatically raise one's level with exposure. This is contested by some of the great masters; the reason assigned: while exposure teaches you new things, playing without understanding concepts discovered by masters of the past result in mistakes becoming a reinforced, to the point the player makes them a habit and is not even aware of the flaws. This justifies some kind of formal framework within which to learn the game. Once a player acquires a level of proficiency they will be better equipped to improvise and experiment.

Contents: The following facets will constitute the broad coverage areas of this course:

1. Counting the number of units of control each side has over a square. Extending it to the weighted case, which incorporates the relative value of pieces.
2. Understanding (general) relative values of pieces, and understanding that these differences become more significant when taken over more moves, but for the purpose of an instant evaluation (taken to the extreme, just one move), any piece is as good as any other.
3. Basic tactics with examples: Pin, fork, skewer, discovery, double attack, deflection, intermezzo, interference.
4. Elementary checkmates in the endgame.
5. Other common checkmating themes.
6. Basic blunder check at every move.
7. Making moves with a purpose at any stage. Varying the depth of look ahead, based on the nature of the position.
8. Opening concepts: rapid development, centre control, king safety and restraining the opponent's forces.
9. Notion of candidate move: Look for forcing options that are favourable, and if none are available, look to improve the position.
10. Special play with each kind of piece

Outcome: At the end of this programme, the students will have improved their chess proficiency, significantly.