Lovely Professional University, Punjab

Course Code	Course Title	Lectures	Tutorials	Practicals	Credits	
INT344	NATURAL LANGUAGE PROCESSING	2	0	1	3	
Course Weightage	ATT: 5 CA: 45 ETT: 50	**Exam Category: X4: Mid Term Exam: Not Applicable – End Term Exam: MCQ + Subjective**				
Course Focus	SKILL DEVELOPMENT					

Course Outcomes :Through this course students should be able to

CO1 :: Define the perceptions of Logistic Regression, Classification and Vector Spaces, Machine Translation, Probabilistic Models, Sequence Models, Attention Models in Natural Language Processing.

CO2 :: Understand the concepts of Sentiment Analysis, Vector Space Models, Hidden Markov Models, Language Models, Recurrent Neural Networks, Siamese Networks uses for Natural Language understanding and generation.

CO3 :: Apply Machine Learning algorithms, Semantic analysis, Syntactic analysis to Natural Language Processing leads to design Real-time NLP applications, NLP tools and systems.

CO4 :: Analyze the notions of Autocorrect, Autocomplete, Word Embeddings with Neural Networks and Syntax, Semantics, and Pragmatics of a Statement written in a Natural Language.

CO5 :: Evaluate the systems using appropriate Descriptions, Visualizations, and Statistics to communicate the problems of English language for Natural Language Processing through Semantic and Syntactic analysis.

CO6 :: Develop NLP tools to Translate Words, Translate Languages, Text Generation, Summarize Text, Word Embeddings, Build Chatbots and Question-Answering.

	TextBooks (T)		
Sr No	**Title**	**Author**	**Publisher Name**
T-1	NATURAL LANGUAGE PROCESSING	ELA KUMAR	DREAMTECH PRESS

	Reference Books (R)		
Sr No	**Title**	**Author**	**Publisher Name**
R-1	SPEECH AND LANGUAGE PROCESSING: AN INTRODUCTION TO NATURAL LANGUAGE PROCESSING, COMPUTATIONAL LINGUISTICS AND SPEECH RECOGNITION	DANIEL JURAFSKY, JAMES H. MARTIN	PEARSON

Other Reading (OR)	
Sr No	**Journals articles as Compulsary reading (specific articles, complete reference)**
OR-1	https://en.wikipedia.org/wiki/Natural_language_processing ,

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OR-2	https://direct.mit.edu/coli ,
OR-3	https://www.cambridge.org/core/journals/natural-language-engineering ,
OR-4	https://www.sciencedirect.com/journal/computer-speech-and-language ,
OR-5	https://www.nltk.org/book/ ,
OR-6	https://dlabs.ai/blog/10-books-to-learn-natural-language-processing/ ,

Relevant Websites (RW)		
Sr No	**(Web address) (only if relevant to the course)**	**Salient Features**
RW-1	https://www.coursera.org/learn/classification-vector-spaces-in-nlp?specialization=natural-language-processing	Natural Language Processing with Classification and Vector Spaces
RW-2	https://www.coursera.org/learn/probabilistic-models-in-nlp?specialization=natural-language-processing	Natural Language Processing with Probabilistic Models
RW-3	https://www.coursera.org/learn/sequence-models-in-nlp?specialization=natural-language-processing	Natural Language Processing with Sequence Models
RW-4	https://www.coursera.org/learn/attention-models-in-nlp?specialization=natural-language-processing	Natural Language Processing with Attention Models

Audio Visual Aids (AV)		
Sr No	**(AV aids) (only if relevant to the course)**	**Salient Features**
AV-1	https://nptel.ac.in/courses/106101007	Video tutorials on Natural Language Processing
AV-2	https://nptel.ac.in/courses/106105158	Video tutorials on Natural Language Processing

Software/Equipments/Databases		
Sr No	**(S/E/D) (only if relevant to the course)**	**Salient Features**
SW-1	https://www.python.org/	Python

LTP week distribution: (LTP Weeks)	
Weeks before MTE	7
Weeks After MTE	7
Spill Over (Lecture)	4

Detailed Plan For Lectures

Week Number	Lecture Number	Broad Topic(Sub Topic)	Chapters/Sections of Text/reference books	Other Readings, Relevant Websites, Audio Visual Aids, software and Virtual Labs	Lecture Description	Learning Outcomes	Pedagogical Tool Demonstration/ Case Study / Images / animation / ppt etc. Planned	Live Examples

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Week 1	Lecture 1	Natural Language Processing with Classification and Vector Spaces(Sentiment Analysis with Logistic Regression: Extract Features from Text into Numerical Vectors)	T-1	OR-1 OR-5 AV-1 AV-2	Lecture 1 should be used to discuss Lecture Zero, Discuss about Syllabus, to discuss introduction of NLP and its examples, Sentiment Analysis with Logistic Regression: Extract Features	Student will understand course overview and its use, Learn to extract features from text into numerical vectors	Discussion using power point presentation and coursera videos	Examples of NLP tools
	Lecture 2	Natural Language Processing with Classification and Vector Spaces(Binary Classifier using a Logistic Regression)	T-1 R-1	RW-1	Build a binary classifier using a logistic regression	Student will learn to extract features from text into numerical vectors and build a binary classifier	Discussion using power point presentation and coursera videos	
Week 2	Lecture 3	Natural Language Processing with Classification and Vector Spaces(Sentiment Analysis with Naïve Bayes: Bayes' rule for Conditional Probabilities)	T-1 R-1	RW-1	Theory behind Bayes' rule for conditional probabilities	Student will learn about Sentiment Analysis with Naïve Bayes	Discussion using Power Point Presentation and Coursera videos	
	Lecture 4	Natural Language Processing with Classification and Vector Spaces(Naive Bayes Classifier)	T-1 R-1	RW-1	Apply Naive Bayes classifier for conditional probabilities	Student will learn to build Naive Bayes classifier	Discussion using Power Point Presentation and Coursera videos	
Week 3	Lecture 5	Vector Space Models and Machine Translation(Vector Space Models: Vector Space Models Capture Semantic Meaning)	T-1 R-1	RW-1	Vector space models capture semantic meaning	Student will learn about Vector space models capture semantic meaning and relationships between words	Discussion using Power Point Presentation and Coursera videos	
	Lecture 6	Vector Space Models and Machine Translation (Relationships between Words)	T-1 R-1	OR-3 RW-1	Vector space models capture semantic meaning and relationships between words	Student will learn to create word vectors that capture dependencies between words	Discussion using Power Point Presentation and Coursera videos	
		Vector Space Models and Machine Translation(Create Word Vectors)	T-1 R-1	OR-3 RW-1	Vector space models capture semantic meaning and relationships between words	Student will learn to create word vectors that capture dependencies between words	Discussion using Power Point Presentation and Coursera videos	
Week 4	Lecture 7	Vector Space Models and Machine Translation (Capture Dependencies between Words)	T-1 R-1	RW-1	Semantic meaning and relationships between words, Visualize the relationships	Student will learn to visualize the word relationships in two dimensions	Discussion using Power Point Presentation and Coursera videos	

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Week 4	Lecture 7	Vector Space Models and Machine Translation (Visualize the Relationships in Two Dimensions Using PCA)	T-1 R-1	RW-1	Semantic meaning and relationships between words, Visualize the relationships	Student will understand how to visualize the word relationships in two dimensions	Discussion using Power Point Presentation and Coursera videos	
	Lecture 8	Vector Space Models and Machine Translation (Machine Translation and Document Search: Transform Word Vectors)	T-1 R-1	RW-1	Transform word vectors and assign them to subsets using locality sensitive hashing, in order to perform machine translation and document search	Student will learn to transform word vectors, locality sensitive hashing, machine translation and document search	Discussion using Power Point Presentation and Coursera videos	
		Vector Space Models and Machine Translation(Assign to Subsets using Locality Sensitive Hashing)	T-1 R-1	RW-1	Transform word vectors and assign them to subsets using locality sensitive hashing, in order to perform machine translation and document search	Student will learn to transform word vectors, locality sensitive hashing, machine translation and document search	Discussion using Power Point Presentation and Coursera videos	
		Vector Space Models and Machine Translation (Machine Translation and Document Search)	T-1 R-1	RW-1 SW-1	Transform word vectors and assign them to subsets using locality sensitive hashing, in order to perform machine translation and document search	Student will learn to transform word vectors, locality sensitive hashing, machine translation and document search	Discussion using Power Point Presentation and Coursera videos	
Week 5	Lecture 9	Natural Language Processing with Probabilistic Models (Autocorrect: Minimum Edit Distance)	T-1 R-1	OR-6 RW-2	Autocorrect, Minimum edit distance, and Dynamic programming	Student will learn about autocorrect, minimum edit distance, and dynamic programming, and build spellchecker to correct misspelled words	Discussion using Power Point Presentation and Coursera videos	
		Natural Language Processing with Probabilistic Models (Dynamic Programming)	T-1 R-1	OR-4 RW-2	Autocorrect, Minimum edit distance, and Dynamic programming	Student will learn about autocorrect, minimum edit distance, and dynamic programming, and build spellchecker to correct misspelled words	Discussion using Power Point Presentation and Coursera videos	

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Week 5	Lecture 9	Natural Language Processing with Probabilistic Models (Spellchecker to Correct Misspelled Words)	T-1 R-1	RW-2	Autocorrect, Minimum edit distance, and Dynamic programming	Student will learn about autocorrect, minimum edit distance, and dynamic programming, and build spellchecker to correct misspelled words	Discussion using Power Point Presentation and Coursera videos	
	Lecture 10	Natural Language Processing with Probabilistic Models(Part of Speech Tagging and Hidden Markov Models: About Markov Chains and Hidden Markov Models)	T-1 R-1	RW-2	Markov chains and Hidden Markov models	Student will learn about Markov chains and Hidden Markov models, then use them to create part-of-speech tags	Discussion using Power Point Presentation and Coursera videos	
		Natural Language Processing with Probabilistic Models(Part-Of-Speech Tags using a Text Corpus)	T-1 R-1	RW-2	Markov chains and Hidden Markov models	Student will learn about Markov chains and Hidden Markov models, then use them to create part-of-speech tags	Discussion using Power Point Presentation and Coursera videos	
Week 6	Lecture 11	Natural Language Processing with Probabilistic Models (Autocomplete and Language Models: N-gram Language Models work by Calculating Sequence Probabilities)	T-1 R-1	RW-2	N-gram language models work by calculating sequence probabilities	Students will learn about how N-gram language models work by calculating sequence probabilities, then build your own autocomplete language model using a text corpus	Discussion using Power Point Presentation and Coursera videos	
		Natural Language Processing with Probabilistic Models (Autocomplete Language Model using a Text Corpus)	T-1 R-1	RW-2	N-gram language models work by calculating sequence probabilities	Students will learn about how N-gram language models work by calculating sequence probabilities, then build your own autocomplete language model using a text corpus	Discussion using Power Point Presentation and Coursera videos	
	Lecture 12	Natural Language Processing with Probabilistic Models(Word Embeddings with Neural Networks: Word Embeddings)	T-1 R-1	OR-2 RW-2	Word embeddings carry the Semantic meaning of words	Students will learn to make more powerful of NLP tasks	Discussion using Power Point Presentation and Coursera videos	

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Week 6	Lecture 12	Natural Language Processing with Probabilistic Models (Semantic Meaning of Words)	T-1 R-1	RW-2	Word embeddings carry the Semantic meaning of words	Students will learn to make more powerful of NLP tasks	Discussion using Power Point Presentation and Coursera videos	
Week 7	Lecture 13	Natural Language Processing with Probabilistic Models(NLP Tasks)	T-1 R-1	RW-2	Continuous bag-of-words, word embeddings	Students will learn to build Continuous bag-of-words model to create word embeddings	Discussion using Power Point Presentation and Coursera videos	
		Natural Language Processing with Probabilistic Models (Continuous Bag-Of-Words)	T-1 R-1	RW-2	Continuous bag-of-words, word embeddings	Students will learn to build Continuous bag-of-words model to create word embeddings	Discussion using Power Point Presentation and Coursera videos	
		SPILL OVER						
Week 7	Lecture 14				Spill Over			
		MID-TERM						
Week 8	Lecture 15	Natural Language Processing with Sequence Models(Neural Networks for Sentiment Analysis: Neural Networks for Deep Learning)	T-1 R-1	RW-3	Neural Networks for Deep Learning	Students will learn about Learn about Neural Networks for Deep Learning to build positive or negative sentiment categories	Discussion using Power Point Presentation and Coursera videos	
		Natural Language Processing with Sequence Models(Positive or Negative Sentiment Categories)	T-1 R-1	RW-3	Neural Networks for Deep Learning	Students will learn about Learn about Neural Networks for Deep Learning to build positive or negative sentiment categories	Discussion using Power Point Presentation and Coursera videos	
	Lecture 16	Natural Language Processing with Sequence Models(Recurrent Neural Networks for Language Modelling: Traditional Language Models)	T-1 R-1	OR-4 RW-3	RNNs and GRUs use sequential data for text prediction	Student will learn about the limitations of traditional language models and see how RNNs and GRUs use sequential data for text prediction	Discussion using Power Point Presentation and Coursera videos	

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Week 8	Lecture 16	Natural Language Processing with Sequence Models(RNNs and GRUs)	T-1 R-1	RW-3	RNNs and GRUs use sequential data for text prediction	Student will learn about the limitations of traditional language models and see how RNNs and GRUs use sequential data for text prediction	Discussion using Power Point Presentation and Coursera videos	
Week 9	Lecture 17	Natural Language Processing with Sequence Models(Sequential Data for Text Prediction)	T-1 R-1	RW-3	RNNs and GRUs use sequential data for text prediction	Student will learn about the limitations of traditional language models and see how RNNs and GRUs use sequential data for text prediction	Discussion using Power Point Presentation and Coursera videos	
		Natural Language Processing with Sequence Models(Next-Word Generator using a Simple RNN)	T-1 R-1	RW-3	RNNs and GRUs use sequential data for text prediction	Student will learn about the limitations of traditional language models and see how RNNs and GRUs use sequential data for text prediction	Discussion using Power Point Presentation and Coursera videos	
	Lecture 18	Natural Language Processing with Sequence Models(LSTMs and Named Entity Recognition: Long Short-Term Memory units (LSTMs))	T-1 R-1	RW-3	Long Short-Term Memory units (LSTMs) solve the vanishing gradient problem, Named Entity Recognition systems	Student will learn about Learn about how long short-term memory units (LSTMs) solve the vanishing gradient problem, and how Named Entity Recognition systems quickly extract important information from text	Discussion using Power Point Presentation and Coursera videos	
		Natural Language Processing with Sequence Models(Vanishing Gradient Problem)	T-1 R-1	RW-3	Long Short-Term Memory units (LSTMs) solve the vanishing gradient problem, Named Entity Recognition systems	Student will learn about Learn about how long short-term memory units (LSTMs) solve the vanishing gradient problem, and how Named Entity Recognition systems quickly extract important information from text	Discussion using Power Point Presentation and Coursera videos	

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Week 9	Lecture 18	Natural Language Processing with Sequence Models(Named Entity Recognition Systems)	T-1 R-1	RW-3	Long Short-Term Memory units (LSTMs) solve the vanishing gradient problem, Named Entity Recognition systems	Student will learn about Learn about how long short-term memory units (LSTMs) solve the vanishing gradient problem, and how Named Entity Recognition systems quickly extract important information from text	Discussion using Power Point Presentation and Coursera videos	
		Natural Language Processing with Sequence Models(Named Entity Recognition System using an LSTM)	T-1 R-1	RW-3	Long Short-Term Memory units (LSTMs) solve the vanishing gradient problem, Named Entity Recognition systems	Student will learn about Learn about how long short-term memory units (LSTMs) solve the vanishing gradient problem, and how Named Entity Recognition systems quickly extract important information from text	Discussion using Power Point Presentation and Coursera videos	
Week 10	Lecture 19	Natural Language Processing with Sequence Models(Siamese Networks: Neural Network made of Two Identical Networks and Merged Together)	T-1 R-1	RW-3	Siamese networks	Student will learn about Siamese networks, a special type of neural network made of two identical networks that are eventually merged together	Discussion using Power Point Presentation and Coursera videos	
		Natural Language Processing with Sequence Models(Identifies Duplicates in a Dataset)	T-1 R-1	RW-3	Siamese networks	Student will learn about Siamese networks, a special type of neural network made of two identical networks that are eventually merged together	Discussion using Power Point Presentation and Coursera videos	

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Week 10	Lecture 20	Natural Language Processing with Attention Models(Neural Machine Translation: Shortcomings of a Traditional seq2seq Model)	T-1 R-1	RW-4 SW-1	Traditional seq2seq model, Attention mechanism, Neural Machine Translation model	Student will learn discover some of the shortcomings of a traditional seq2seq model and to solve by adding an attention mechanism, then build a Neural Machine Translation model with Attention	Discussion using Power Point Presentation and Coursera videos	
		Natural Language Processing with Attention Models(Attention Mechanism)	T-1 R-1	RW-4 SW-1	Traditional seq2seq model, Attention mechanism, Neural Machine Translation model	Student will learn discover some of the shortcomings of a traditional seq2seq model and to solve by adding an attention mechanism, then build a Neural Machine Translation model with Attention	Discussion using Power Point Presentation and Coursera videos	
		Natural Language Processing with Attention Models(Neural Machine Translation Model with Attention)	T-1 R-1	RW-4	Traditional seq2seq model, Attention mechanism, Neural Machine Translation model	Student will learn discover some of the shortcomings of a traditional seq2seq model and to solve by adding an attention mechanism, then build a Neural Machine Translation model with Attention	Discussion using Power Point Presentation and Coursera videos	
Week 11	Lecture 21	Natural Language Processing with Attention Models(Text Summarization: Compare RNNs and other Sequential Models)	T-1 R-1	RW-4	RNNs and other sequential models	Students will learn about RNN and other models	Discussion using Power Point Presentation and Coursera videos	
	Lecture 22	Natural Language Processing with Attention Models(Modern Transformer Architecture)	T-1 R-1	RW-4	Modern Transformer architecture	Student will learn about Modern Transformer architecture and create a tool that generates text summaries	Discussion using Power Point Presentation and Coursera videos	

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Week 11	Lecture 22	Natural Language Processing with Attention Models(Text Summaries)	T-1 R-1	RW-4	Modern Transformer architecture	Student will learn about Modern Transformer architecture and create a tool that generates text summaries	Discussion using Power Point Presentation and Coursera videos	
Week 12	Lecture 23	Building Models/ Case Studies(Question Answering: Transfer Learning with State-Of-The-Art Models)	T-1 R-1	RW-4 SW-1	Transfer learning with state-of-the-art models like T5 and BERT	Students will learn about Transfer learning	Discussion using Power Point Presentation and Coursera videos	
		Building Models/ Case Studies(T5 and Bert)	T-1 R-1	RW-4 SW-1	Transfer learning with state-of-the-art models like T5 and BERT	Students will learn about Transfer learning	Discussion using Power Point Presentation and Coursera videos	
	Lecture 24	Building Models/ Case Studies(Model for Answering Questions)	T-1 R-1	RW-4	Transfer learning	Student will learn about Transfer learning to build a model that can answer questions	Discussion using Power Point Presentation and Coursera videos	
Week 13	Lecture 25	Building Models/ Case Studies(Chatbot: Examine Unique Challenges)	T-1 R-1	RW-4 SW-1	Unique Challenges of Chatbot	Students will learn about Chatbot	Discussion using Power Point Presentation and Coursera videos	
	Lecture 26	Building Models/ Case Studies(Transformer Models Face and their Solutions)	T-1 R-1	RW-4 SW-1	Transformer models face and their solutions	Students will learn about Transformer models	Discussion using Power Point Presentation and Coursera videos	
Week 14	Lecture 27	Building Models/ Case Studies(Chatbot using a Reformer Model)	T-1 R-1	RW-4 SW-1	Transformer models face and their solutions to build Chatbot	Student will learn about to build a chatbot using a Reformer model	Discussion using Power Point Presentation and Coursera videos	
		SPILL OVER						
Week 14	Lecture 28				Spill Over			
Week 15	Lecture 29				Spill Over			
	Lecture 30				Spill Over			

Scheme for CA:

CA Category of this Course Code is:C020102 (Total 4 tasks, 2 compulsory and out of remaining 1 best out of 2 to be considered)

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Component	Iscompulsory	Weightage (%)	Mapped CO(s)
Project	Yes	35	CO1, CO2, CO3, CO4, CO5, CO6
Term paper	Yes	35	CO1, CO2, CO3, CO4, CO5, CO6
Test - Code based 1	NO	30	CO1, CO2, CO3, CO4, CO5, CO6
Test - Code based 2	NO	30	CO1, CO2, CO3, CO4, CO5, CO6

Details of Academic Task(s)

Academic Task	Objective	Detail of Academic Task	Nature of Academic Task (group/individuals)	Academic Task Mode	Marks	Allottment / submission Week
Project	To make the students learn to implement NLP	Students need to submit a Report and Program in Google drive shared by faculty, Students need to appear for Viva or presentation on the allocated day.	Group	Offline	30	4 / 12
Term paper	To check and enhance research ability and team work among students	A topic will assigned to the students on which proper study will be carried.	Group	Offline	30	4 / 5
Test - Code based 1	To check the understanding of the Syllabus topics	As per IP, Syllabus of written test will be informed and conducted Code based test	Individual	Offline	30	6 / 7
Test - Code based 2	To check the understanding of the Syllabus topics	As per IP, Syllabus of written test will be informed and conducted Code based test	Individual	Online	30	13 / 14

MOOCs/ Certification etc. mapped with the Academic Task(s)

Academic Task	Name Of Certification/Online Course/Test/Competition mapped	Type	Offered By Organisation
Test - Code based 1	NATURAL LANGUAGE PROCESSING	MOOCs	NPTEL

Where MOOCs/ Certification etc. are mapped with Academic Tasks:
1. Students have choice to appear for Academic Task or MOOCs etc.
2. The student may appear for both, In this case best obtained marks will be considered.

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Detailed Plan For Practicals

Practical No	Broad topic	Subtopic	Other Readings	Learning Outcomes
Practical 1	List of Practical/ Experiments	Build a Binary Classifier for Tweets using a Logistic Regression.	RW-1 SW-1	Student will learn about Binary Classifier using Logistic Regression
Practical 2	List of Practical/ Experiments	Build a Naive Bayes Tweet Classifier.	RW-1 SW-1	Student will learn about Naive Bayes Classifier for Sentiment Analysis
Practical 3	List of Practical/ Experiments	Create Word Vectors that Capture Dependencies between Words, then Visualize their relationships in Two Dimensions using PCA.	RW-1 SW-1	Student will learn how to create word vectors that capture dependencies between words, then visualize their relationships in two dimensions using PCA
Practical 4	List of Practical/ Experiments	Transform Word Vectors and Assign them to Subsets using Locality Sensitive Hashing.	RW-1 SW-1	Student will learn to transform word vectors and assign them to subsets using locality sensitive hashing, in order to perform machine translation and document search
Practical 5	List of Practical/ Experiments	Build your own Spellchecker to Correct Misspelled Words.	RW-2 SW-1	Student will learn about autocorrect, minimum edit distance, and dynamic programming, then build your own spellchecker to correct misspelled words
Practical 6	List of Practical/ Experiments	Create Part-of-Speech Tags for a Wall Street Journal Text corpus using Markov models.	RW-2 SW-1	Student will learn about Markov chains and Hidden Markov models, then use them to create part-of-speech tags
Practical 7	List of Practical/ Experiments	Build your own Autocomplete Language model using a Text corpus from Twitter using N-gram Language models.	RW-2 SW-1	Student will learn about N-gram language models work by calculating sequence probabilities, then build your own autocomplete language model
Practical 8	List of Practical/ Experiments	Build your own Continuous Bag-of-Words model to Create Word Embeddings from Shakespeare text.	RW-2 SW-1	Student will learn about how word embeddings carry the semantic meaning of words, then build your own Continuous bag-of-words model to create word embeddings
Practical 9	List of Practical/ Experiments	Build a Sophisticated Tweet Classifier that places Tweets into Positive or Negative Sentiment categories, using a Deep Neural Network.	RW-3 SW-1	Student will learn to build a sophisticated tweet classifier that places tweets into positive or negative sentiment categories, using a deep neural network
Practical 10	List of Practical/ Experiments	Build your own Next-Word Generator using a simple RNN on Shakespeare Text data.	RW-3 SW-1	Student will learn about RNNs and GRUs use sequential data for text prediction. Then build your own next-word generator using a simple RNN
Practical 11	List of Practical/ Experiments	Build your own Named Entity Recognition system using an LSTM and Data from Kaggle.	RW-3 SW-1	Student will learn about LSTMs solve the vanishing gradient problem, and how Named Entity Recognition systems quickly extract important information from text. Then build your own Named Entity Recognition system

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Practical 12	List of Practical/ Experiments	Build your own Siamese Network that Identifies Question Duplicates in a Dataset from Quora.	RW-3 SW-1	Student will learn about Siamese networks, made of two identical networks that are eventually merged together, identifies question duplicates in a dataset
Practical 13	List of Practical/ Experiments	Build a Neural Machine Translation model with Attention that Translates English Sentences into German.	RW-4 SW-1	Student will learn traditional seq2seq model and to solve for them by adding an attention mechanism, then build a Neural Machine Translation model with Attention
Practical 14	List of Practical/ Experiments	Create a Tool that Generates Text Summaries.	RW-4 SW-1	Student will learn RNNs and modern Transformer architecture, then create a tool that generates text summaries
	SPILL OVER			
Practical 15	Spill Over			

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