AI-ML-Azure TechM

	MON	TUE	WED	THU	FRI	ENVIRONMENT
Week 1 - Python	Cohort Start Ceremony Git Fundamentals Source Control Management(git, vcs, cvcs, dvcs) Git Fundamentals Initializing A Repository Pushing To A Remote Repository Git Commit Branch Merge Push Pull Gitignore Agile for Developers Introduction To Sdlc Agile Story Pointing And Burndown Charts Scrum Ceremonies	Project 0 Python-Fundamentals Python-Orientation Interpreter vs Compiler REPL Jupyter Python-Basics What is Python Why Python Python Syntax Comments Variables and Datatypes User Input and Output Python-DataTypes Namespaces Strings Casting Boolean Lists Tuples Range Sets Binary Type Nontype	Project O Python-Fundamentals Python-FlowControl- Stmts If-Else While For Function Lambda map & filter Arrays Python-Classes & Inheritance Classes and Objects OOP Concepts Inheritance Iterators Scope	Project O Python-Fundamentals Python-Modules Module Math Logging JSON Regex pip and install pip pylint Connect SQL Numpy: Setup, Basics, Indexing, Arithmetic, Dot Product, Axis Operations, Broadcast, Transpose, Reshape, Joining, Expand, Reduce Seaborn: Histograms, KDE, Box Plots, Categorical Scatter Plots, Pair Plots, Heatmaps Fast API: Serving Data, Serving Structured Data using Pydantic Models, Databases, HTTP, Authentication, Testing, Deployment	Project O Python-Fundamentals Python-Exception Handling Error Exception Handling try-except File Handling Read Files Python-File Handling Write Create Files Peding and writing CSV, JSON, native PDF files Pandas EDA: Setup, Load/Save Data, Filtering, Sorting, Grouping, Indexing, Preprocessing, Clean-Up	 Python VSCode Git pandas Seaborn Fast API
Week 2 - ML Foundations	Project 0 Quiz #1 Trainer 1/1 Assessment ML Foundations Introduction to	Project 0 ML Foundations Quality Audit Feature Engineering Transformations (Simple Label	Project 0 ML Foundations Regularization Techniques L1 and L2 Regularization	Project 0 ML Foundations Random Forests • Ensemble learning and bagging. • Random forest	Project O Showcase ML Foundations Review, Fall Over	

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	MON	TUE	WED	THU	FRI	ENVIRONMENT
	Machine Learning	Preserving,	Ridge regression:	construction and		
	• ML, What is it?,	Perturbation, Data	L2 regularization for	feature importance.		
	Applications, Use	Synthesis)	reducing overfitting	Out-of-bag		
	Cases, Systems	Feature scaling:	Lasso regression:	estimation and tuning		
	supervised vs	normalization,	L1 regularization for	parameters.		
	unsupervised learning	standardization.	feature selection.	Support Vector		
	onsopervised learning	Handling		Machines		
	Data Preprocessing	categorical variables:	Decision Trees	Muchines		
	and Exploration	one-hot encoding,	Basics of decision	Basics of SVM:		
	Exploratory Data	ordinal encoding.	tree algorithms:	maximum margin,		
	Analysis (EDA)		construction, splitting	support vectors.		
		• Word	criteria (e.g., Gini	kernel based		
	Data cleaning:	Embeddings vs One-	index, information	methods		
	handling missing	Hot Encoding	gain).			
	values, outliers, and	Feature Extraction	Tree pruning	k-nearest neighbors		
	noise.	with Principal	techniques: pre-	Training,		
	Handling	Component Analysis	pruning, post-pruning.	Prediction, and		
	duplicate records.	(PCA)		calculating the		
	• Familiar !!	Linear	Handling	Euclidean Distances		
	Feature scaling, normalization, and	Discriminant Analysis	categorical predictors	between data points		
	encoding.	(LDA) and/or	and missing values.	Ensemble Methods		
	encoung.	Singular Value	Clustering	Fusemble Mellods		
		Decomposition (SVD)		 Boosting 		
		for dimensionality	• K-means	techniques:		
		reduction	clustering: algorithm,	AdaBoost, Gradient		
			initialization, and	Boosting.		
		Nonlinear	convergence.	Bagging		
		dimensionality	Hierarchical	techniques: bootstrap		
		reduction techniques	clustering:	aggregating, random		
			agglomerative and	subspace.		
		and nonlinear manifold learning	divisive approaches.			
		manifold learning methods such as	Density-based	Stacking:		
		UMAP (Uniform	clustering: DBSCAN,	combining multiple		
		Manifold	OPTICS.	models for improved		
		Approximation and		performance.		
		Projection) and t-SNE	Naïve Bayes			
		(t-Distributed	Application areas			
		Stochastic Neighbor	and strengths of			
		Embedding)	Naive Bayes.			
		Handling text	Handling			
		data: text cleaning,	continuous and			
		tokenization,	categorical features			
		stemming,	with Naive Bayes			
		lemmatization.				
		Feature selection				
		techniques: filter				
		methods, wrapper				
		methods, embedded				
		methods.				
		Handling High-				
		Dimensional Data:				
		Curse of				

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		MON	TUE	WED	THU	FRI	ENVIRONMENT
			challenges and				
			techniques.				
			Linear Regression				
			Simple linear				
			regression: model				
			formulation,				
			interpretation, and				
			evaluation.				
			evaluation.				
			 Multiple linear 				
			regression: handling				
			multiple predictors,				
			interpretation, and				
			multicollinearity.				
			Polynomial				
			regression: modeling				
			nonlinear				
			relationships.				
			reidiiolisiiips.				
			Interpreting				
			regression				
			coefficients.				
			Residual analysis				
			and model				
			diagnostics				
			diagnosiies				
			 Techniques for 				
			model selection:				
			cross-validation, train-				
			test splits				
			Logistic Regression				
			Binary logistic				
			regression: model				
			formulation,				
			interpretation, and				
			evaluation.				
			Multinomial				
			logistic regression:				
			handling multiple				
			classes.				
			Evaluation with				
			AUC - ROC (Area				
			Under the Receiver				
			Operating				
			Characteristic Curve)				
	Week 3 - TensorFlow	Project 1	Project 1	Project 1	Project 1	Project 1	TensorFlow
		Quiz #2	Quality Audit	TensforFlow and	TensforFlow and	TensforFlow and	• Keras
		Trainer 1/1	TensforFlow and	Keras	Keras	Keras	
		Assessment	Keras	Models and Layers	Transfer learning	Review, Fall Over	
		TensforFlow and	TensorFLow	Sequential	 loading and 	tf.transform	
		Keras	Operations	Models and Adding	saving Keras models,	Tensorflow	
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	MON	TUE	WED	THU	FRI	ENVIRONMENT
	Introduction to	Mathematical,	layers to the model	and saving using	transform Introduction	
	TensorFlow	Reduction, and	using the add()	HDF5 format and	Anglyze phase	
		Matrix operations	method.Configuring	exporting models	Analyze phase	
	Overview of		layer parameters such	using TensorFlow	• transform phase	
	TensorFlow as a deep	Data	as activation function,	SavedModel format	support serving	
	learning framework	Manipulation	input shape, and	leveraging pre-	support serving	
	Installing and	Operations	output shape.	trained models		
	setting up TensorFlow.	Activation	Functional API	Irainea models		
		Functions,	Models and Creating	removing top		
	TensorFlow Basics	Convolution	complex model	layer and adding new		
	Tensor objects	Operations, and	architectures with	layers		
	and operations	Recurrent Operations	multiple inputs and			
		'	outputs. Utilizing	training the model		
	Computation	Loss Functions and	shared layers and	• fine-tuning model		
	graphs, and sessions	Gradient Operations	layer reuse in model			
	Introduction to	Image Operations	architectures	evaluate and		
	Keras	ago operanons	diciniectores	deploy		
	Refus	TensorFlow Estimators	Dense Layers	TF Hub		
		Predefined	• Consulti			
		Estimators including	• Convolution	Accessing		
		_	Layers (Conv1D,	Tensorflow Hub using		
		linear regression,	Conv2D, and	PIP and the Python		
		logistic regression,	Conv3D layers for	API		
		deep neural networks	image and sequence	model formats i.e.		
		(DNNs), and gradient	data.) and Recurrent	TensorFlow		
		boosting models	Layers (LSTM, GRU,	SavedModel vs. TF2		
		(GBMs).	and SimpleRNN	SavedModel.		
		Using train() and	layers for sequence	347341710461.		
		evaluate() with an	modeling.)	 understanding 		
		estimator	Custom Layer	input and output		
			Creation: Building	requirements using		
		tf.data	custom layers in Keras	Model Signature and		
		Data loading	using the subclassing	inspecting model		
		including built-in	API. Defining the	layers using		
		datasets such as	forward pass and	summary()		
		MNIST and CIFAR-10	backward pass	D . M		
			methods.	Running Models in a		
		Transformation	Incorporating custom	Browser		
		and Preprocessing	layers into models.	Converting a		
		with map(), filter(),	layers mio models.	Keras HDF5 model to		
		batch(), and etc.	Pooling Layers	Tensorflow.js or other		
			using MaxPooling2D,	models types such as		
			GlobalMaxPooling1	SavedModel to		
			D, and	Tensorflow.js		
			AveragePooling3D			
			for downsampling	Hosting Model		
			and feature	File on a server or VM		
			extraction.	Loading and		
				Running the model in		
			Model Training and	a browser		
			Evaluation	3 510 11301		
			Configuring the			
			model for training			
			using the compile()			
			method.			

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			using the fit() method. Setting batch size, epochs, and validation split. Evaluating model performance using the evaluate() method.			
Week 4 - Neural Networks NN, CNN, and RNN	Project 1 Quiz #3 Trainer 1/1 Assessment Neural Networks Introduction to Artifical Neural Networks (ANN) ANN vs. biologial Neural Networks Tensorboard Building Blocks of Neural Networks inputs, weights, bias, and activation functions layers and their types (dense, convolution, and recurrent) Forward and backward prograpogation	Project 1 Quality Audit Neural Networks Building and Training Neural Networks with Keras Sequential and functional API for building models Adding layers to a model Configuring layer parameters (activation functions, number of units, etc.) Compiling the model to prepare for training Preparing input data (data preprocessing, normalization, one- hot encoding) Splitting data into	method. Project 1 Neural Networks Convolution Neural Networks (CNN) Introduction to Computer Vision CNN architecture overview (e.g., LeNet-5, AlexNet, VGG, ResNet, Inception, etc.) input, convolution layer, filters, stride and padding, activation function, output feature maps Pooling Layers: Max Pooling and Average Pooling Image Classification Evaluating Performance of CNNs	Project 1 Neural Networks Recurrent Neural Networks (RNN) RNN: inpute and time steps, recurrent unit, recurrent connection, activation function, output Back Propogation through Time (BPTT) training Long Short-Term Memory (LSTM) and Gated Recurrent Units (GRUs) Word Embeddings (Word2Vec, GloVe) and language modeling with RNNs Building and training RNNs for text generation or time series analysis	Project 1 Neural Networks Review, Fall Over	• TensorFlow
		training, validation, and test sets Batch size and epoch concepts Training loop and model.fit() method Overfitting and underfitting detection and mitigation techniques Early stopping and model checkpoints Evaluating the model on validation		Application to NLP tasks (sentiment analysis, named entity recognition)		

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		and test sets				
	D : 11	D : 11	D : 1	D : 11	D : 110	TensorFlow
	Project 1	Project 1	Project 1	Project 1	Project 1 Showcase	
	Quiz #4	Quality Audit	Generative Deep	MLflow	Review, Fall Over	
	Trainer 1/1	General	Learning	Introduction to		
	Assessment	Language	 Variational 	Mlflow		
	Natual Language	Understanding	Autoencoders (VAEs)	Utilizing the		
	Processing (NLP)	Evaluation (GLUE)	and generating new	MLflow Model		
	• Clausian and	Benchmark	samples	Registry for model		
	 Cleaning and Normalizing Text 	Named Entity	Generative	versioning and		
	Data	Recognition (NER)	Adversarial Networks	management.		
		Machine	(GANs): using	Logging		
	Working with the	Translation	generator and	parameters, metrics,		
	Tokenizer	Natural Language	discriminator to generate synthetic	and artifacts during		
	Text to Sequence	Understanding (NLU)	data	model training		
	Word Embedding:	_	W 110 1 .	Machine Learning		
	The IMDB Dataset	Text Summarization	Model Deployment and Serving	Pipelines		
	Sentiment in Text:	Summarization		Workflow		
	Word-based	Transfer Learning with	• TensorFlow	Orchestration and		
	Encodings	Neural Networks	Serving for NLP	Automation		
	, o	Using pre-trained	models			
Week 5 - Neural		models and model	Containerization	Performance Optimization and		
Networks		weights	of NLP models	Scalability		
ural Networks - NLP, nsfer Learning, Deep		Techniques for	RESTful APIs for	·		
earning and Model		fine-tuning and	model serving	Exporting trained		
Deployment		adapting models to		models for		
		new tasks	Deploying NLP models on cloud	deployment		
		Frozen layers and	platforms	TFX Pipeline		
		trainable layers		Data Ingestion		
		,		and Preprocessing		
				using data from		
				databaes, files, or		
				streaming platforms		
				Model Training		
				and Evaluation		
				Model validation		
				with holdout dataset		
				or cross-validation		
				and exporting and		
				serving model		
				Managing the		
				end-toend ML		
				pipeline worflow and		
				coordinating the		
				execution of different		
				pipeline components		
Week 6 - Azure Al Engineer Associate	Project 2	Project 2	Project 2	Project 2	Project 2	
Certification	Quiz #5	Quality Audit	Deploy Azure Al	Analyze video	Review, Fall Over	
	Trainer 1/1	Prepare to develop AI	services in containers	Azure Video	Build a conversational	

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Closed Computing Model Types - Closed Computing Service Viges - Overview of tracks, Prox.5 Soa's - Closed Computing Definition Azure Fundamentals - Overview of Tracks - Ove	Assessment	solutions on Azure	 Understand 	Indexer capabilities	language	
Cloud Congularing Model Types Cloud Computing Service Types Conversive of local, Face Standard Computing Continuon Acture Fundamentals Control on Virtual Machine in Acture Standard in Acture Control on Virtual Machine in Acture Control on Virtual Machine in Acture Standard in Acture Control on Virtual Machine in Acture Control on Virtual Machine in Acture Standard in Acture Control on Virtual Machine ** Acture All virtual Virtual Control on Virtual Machine in Acture Control on Virtual Machine Acture Control on Virtual Machine Acture Control on Virtual Machine ** Acture All virtual Machine Acture Control on Virtual Machine Acture Control on Virtual Machine Acture Control on Virtual Machine ** Acture All virtual Machine Acture Control o	Cloud Introduction	Considerations for	Containers	Extract custom	understanding model	
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Definition Azure Fundamentals - Cverview of Azure - How to Create a Virtual Machine in Azure - Leas REST API - Azure Storage Overview - Secure Azure AI - Deploying a Storict Webbite via Blob Storage - Creating an Azure Database for MyS-QL - View Mestric - Monage Diagnostic Loggling - Create Alerth - View Mestric - Monage Diagnostic Loggling - Create Alerth - View Mestric - Monage Diagnostic Loggling - Create Alerth - View Mestric - Monage - Create Alerth - View Mestric - Monage - Create Alerth - View Mestric - Monage - Diagnostic Loggling - Create Alerth - View Mestric - Monage - Diagnostic Loggling - Create Alerth - View Mestric - Monage - Create Alerth -	Cloud Computing		Generate a smart-	·		
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options for reading text			Service	_		
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Read API			TEXT			
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Week 7		-				EITTIKOTTIKET
Azure Al Engineer	Project 2	Project 2	Project 2	Project 2	Project 2	
Associate Certification, Gen Al fundamentals	Quiz #6	Quality Audit	LLM-Introduction	Prompt Engineering	Azure Open Al Service	
Cen Ai fondamentais	Trainer 1/1	Azure Al Search	Al-Orientation	Prompt-Engineering	Service	
	Assessment	Solution	ML Introduction	• Prompt	Azure Open Al Service Introduction	
	Azure Al Translator	Azure Al Search	Al Introduction	Engineering		
	service	Introduction		Introduction	Azure OpenAl	
	Provision an	Manage capacity	LLM -Introduction	• Zero-shot	Studio	
	Azure Al Translator resource	• search	LLM-Overview	Prompting	 Gen Al Models in Azure Open Al 	
		components	GenAl Overview	Few-shot		
	• Understand	Indexing process	• LLMs (GPT, BERT,	prompting	Azure Open Al	
	language detection, translation, and	Search an Index	Claude, Llama,	 Constraints 	Deployments	
	transliteration	Search an index	Copilot, Codeium)	Fine-tuning and	Test models in	
		Apply filtering &	Use cases for LLM	Conditioning	Azure OpenAl	
	 Specify translation 	sorting			Studio's Playground	
	options	Enhance the index	Security	Interaction and Dialog State	Natural language	
	Define custom	Create a custom	considerations	Dialog State	solutions with Azure	
	translations	skill for Azure AI	LLM best practices	 Instructions and 	OpenAl Service	
	Translate text with the	Search	Hallucinations	Guidelines	Azure OpenAl	
	Azure Al Translator			Hallucinations	REST API	
	service	Create a knowledge store with	Al Review	Responsible	Azure OpenAl	
	Create speech-	Azure Al Search		Usage	SDK	
	enabled apps with					
	Azure Al services	Create Search		Security	Integration of Azure	
	Provision an	Solution using Azure Al Search		Prompt	OpenAl with an Application	
	Azure resource for	Al Search		Engineering Review	Application	
	speech	Azure Al Document			Apply prompt	
		Intelligence solution			engineering with	
	Use the Azure Al	Al Document			Azure OpenAl	
	Speech to Text API	Intelligence			Service	
	 Use the text to 	Introduction			Generate code with	
	speech API	Plan Azure Al			Azure OpenAl	
	Configure audio	Document Intelligence			Service	
	format and voices	resources			Generate images with	
	Use Speech	Choose a model			Azure OpenAl	
	Synthesis Markup	type			Service using DALL-E	
	Language					
	Create a speech-	Use prebuilt Decument intelligence				
	enabled app	Document intelligence models				
	Translate speech with	Train custom				
	the Azure Al Speech service	models				
	SELVICE	Azure Document				
	Provision an	Intelligence Studio				
	Azure resource for	Analyze a document				
	speech translation	using Azure Al				
	Translate speech	Document Intelligence				
	to text	Extract data from				

18/24, 2:25 PM	RevaturePro Al-ML-Azure TechM					
	MON	TUE	WED	THU	FRI	ENVIRONMENT
Week 8 LangChain Overview	translations Translate speech using Azure AI Speech Service Project 2 Quiz #7 Trainer 1/1 Assessment Retrieval Augmented Generation (RAG) with Azure OpenAI Service RAG Introduction Data Sources Chat with model using your own data Fundamentals of Responsible Generative AI Plan a responsible generative AI solution Identify, Measure and Mitigate Potential harms Operate a responsible generative AI solution	Project 2 Quality Audit LangChain- Orientation Introduction to Models Using LLMs with LangChain-Prompts Prompt Templates Parsing Output Serialization of Prompts LangChain-Chains LangChain Chains Runnable Passthrough Runnable Lambda			Project 2 Azure Al Associate Certification Exam	ENVIRONMENT
Week 9	Explore content filters in Azure OpenAl Project 2	Runnable Parallel Project 2	Project 2	Project 2	Project 2 Showcase	
Project 2					Promotion Ceremony	

PROJECT	TECHNOLOGIES
Project 0	Python, EDA, pandas, Seaborn, Fast API
Project 1	TensorFlow, Neural Networks, Computer Vision, NLP
Project 2	Python, TensorFlow, Neural Networks, Natural Language Processing, LLM, Prompt Engineering, Azure AI Services

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