1]:	ask-4) mporting basic libraries uport numpy as np uport pandas as pd uport matplotlib.pyplot as plt uport seaborn as sns uport seaborn as sns	
2]:	<pre>om sklearn.model_selection import train_test_split om sklearn.feature_extraction.text import TfidfVectorizer #It convert text document into numeric representation om sklearn.linear_model import LogisticRegression # Logistic Regression Algorithm om sklearn.metrics import accuracy_score ita_set=pd.read_csv(r"C:\Users\HP\OneDrive\Documents\oasis infobytes\spam.csv",encoding='ISO-8859-1')</pre>	
3]: 3]:	ta_set_head() v1 v2 Unnamed:	Unr
	Go until jurong ham point, NaN NaN NaN NaN NaN NaN NaN NaN NaN Na	
	ham Joking wif u oni NaN NaN NaN NaN NaN NaN NaN NaN NaN	
	win FA Cup fina U dun say so early	
	ham hor U c NaN NaN NaN NaN NaN NaN NaN NaN NaN N	
	ham goes to NaN NaN NaN NaN NaN NaN NaN NaN NaN Na	
]:		
4]:	Data cleaning: taset=data_set.drop(['Unnamed: 2','Unnamed: 3', 'Unnamed: 5', 'Unnamed: 6', 'Unnamed: 7', 'Unnamed: 8', 'Unnamed: 10', 'Unnamed: 11', 'Unnamed: 12', 'Unnamed: 13', 'Unnamed: 14',	
5]:	'Unnamed: 15', 'Unnamed: 16', 'Unnamed: 17', 'Unnamed: 18', 'Unnamed: 19', 'Unnamed: 20', 'Unnamed: 21', 'Unnamed: 22', 'Unnamed: 23', 'Unnamed: 24', 'Unnamed: 25'],axis=1) Itaset.head()	
5]:	ham Go until jurong point, crazy Available only ham Ok lar Joking wif u oni spam Free entry in 2 a wkly comp to win FA Cup fina	
]:	ham U dun say so early hor U c already then say ham Nah I don't think he goes to usf, he lives aro taset.tail()	
]:	v1 v2 67 spam This is the 2nd time we have tried 2 contact u 68 ham Will i_b going to esplanade fr home? 69 ham Pity, * was in mood for that. Soany other s	
]:	70 ham The guy did some bitching but I acted like i'd 71 ham Rofl. Its true to its name ataset.isnull().sum()	
]:]:]:	0 ype: int64 taset.duplicated().sum() 3	
]:	taset=dataset.drop_duplicates(keep="first") #Removing the duplicate taset.duplicated().sum() #rechecking Duplicate values	
]:]:	taset.shape 169, 2) Tename the columns	
]:]:	taset.rename(columns={'v1':'Category','v2':'Message'},inplace=True) Category Message ham Go until jurong point, crazy Available only	
	ham Go until jurong point, crazy Available only ham Ok lar Joking wif u oni spam Free entry in 2 a wkly comp to win FA Cup fina ham U dun say so early hor U c already then say ham Nah I don't think he goes to usf, he lives aro	
]:		
3]:	Data Visualization t.pie(dataset['Category'].value_counts(),labels=['ham','spam'],autopct="%0.2f")	
	t.show()	
.7]: 8]: 9]:	Int (X) On until juroup point, cray. Available only Free entry in 2 m Collection and in until Juroup point, cray. Available only Free entry in 2 m Collection and in until Collection and in the Collec	
2]: 3]:	train=Y_train.astype(int) test=Y_test.astype(int) train 43 1	
	143	
:		
]:	94	
	03 1 07 1 13 1 13 0 98 1 me: Category, Length: 1034, dtype: int32	
]:]:	train COME BACK TO TAMPA FFFFUUUUUUU Congrats! 2 mobile 3G Videophones R yours. cal Please protect yourself from e-threats. SIB ne As if i wasn't having enough trouble sleeping.	
	Just hopeing that wasn Û÷t too pissed up to re Sure, but make sure he knows we ain't smokin yet 26th OF JULY Hi Jon, Pete here, Ive bin 2 Spain recently & No it will reach by 9 only. She telling she wi	
]:	IåÕm cool ta luv but v.tired 2 cause i have be me: Message, Length: 4135, dtype: object test 94 Just looked it up and addie goes back Monday, 92 You best watch what you say cause I get drunk	
	Me i'm not workin. Once i get job Yar lor How u noe? U used dat route too? Under the sea, there lays a rock. In the rock, Well there's a pattern emerging of my friends From someone not to smoke when every time I've Nite nite pocay wocay luv u more than n e thin	
]:	Dear U've been invited to XCHAT. This is our f Hmph. Go head, big baller. me: Message, Length: 1034, dtype: object int(X_test_features)	
	(B., 3577) 0. 2005/306120556433 (B., 3998) 0. 2005/3056939012245 (B., 3998) 0. 2005/3056939012245 (B., 3998) 0. 2005/3056939012245 (B., 3998) 0. 2005/3056939012245 (B., 3998) 0. 4005/30579012245 (B., 3998) 0. 4005/3057901225 (B., 3998) 0. 4005/305790127 (B., 3998) 0. 4005/	
	(1032, 1071) 0.21945854189397707 (1032, 674) 0.24537378511987706 (1032, 394) 0.24905393871920117 (1032, 316) 0.2016158353905777 (1032, 302) 0.1936225930341707 (1033, 3198) 0.7337664084922214	
]:	(1033, 3198) 0.7337664084922214 (1033, 1272) 0.6794018382139002 del = LogisticRegression() del.fit(X_train_features, Y_train) LogisticRegression	
]:	<pre>gisticRegression() ediction_on_training_data = model.predict(X_train_features) curacy_on_training_data = accuracy_score(Y_train, prediction_on_training_data)</pre>	
:	int("Accuracy on training data: ",accuracy_on_training_data) curacy on training data: 0.962273276904474 ediction_on_test_data=model.predict(X_test_features) curacy_on_test_data=accuracy_score(Y_test,prediction_on_test_data)	
]:	int("Accuracy on test data: ",accuracy_on_test_data) curacy on test data: 0.960348162475822	
]:	inal result or prediction:	
]:	put_mail=[" #spam Free entry in 2 a wkly comp to win FA Cup final tkts 21st May 2005. Text FA to 87121 to receive entry question(std txt rate)T&C's apply 08452810075over1 put_data_features = feature_extraction.transform(input_mail) ediction=model.predict(input_data_features) int("Our Mail is: ",prediction) (prediction[0]==1):	18's
	print("Ham mail") se: print("Spam mail") some sample messages: #spam Free entry in 2 a wkly comp to win FA Cup final tkts 21st May 2005. Text FA to 87121 to receive entry question(std txt rate)T&C's apply 08452810075over18's	
	#Even my brother is not like to speak with me. They treat me like aids patent. #WINNER!! As a valued network customer you have been selected to receivea å£900 prize reward! To claim call 09061701461. Claim code KL341. Valid 12 hours only.	
	#I HAVE A DATE ON SUNDAY WITH WILL!! #Nah I don't think he goes to usf, he lives around here though #FreeMsg Hey there darling it's been 3 week's now and no word back! I'd like some fun you up for it still? Tb ok! XxX std chgs to send, å£1.50 to rcv	
]:	#Nah I don't think he goes to usf, he lives around here though	