**ASSIGNMENT - 4**

|  |  |
| --- | --- |
| Assignment Date | 26-10-2022 |
| Student Name | SANJAY KUMAR S |
| Student Roll Number | 1 I 1519104124 |
| Maximum Marks | 2 Marks |

### E\_;;uestiOn 1:

Import the necessary libraries

# Solution:

inprt pandas as pd

inport nuapy as rip

#### import matp1ot1ib.pyplot as pit

1mport seaborn as sn s

#### from sklearn.mode1\_se1ect1on 1mpor£ tra1n\_test\_sp11t

fcom sk1earn .p r e¿ar oc es »1ng 1mpoyt Labe1Encoder

#### from keras.models 1aport t1Dde1

from kera s . 1ayer s 1mporf L5Tfd, Act1x\*aQ1on, Den se, Dropout, Inp1a6, Embedd1ng

ke ras.opt 1n1zers ' nport RFtSprop

fFDm ke ras.preproces sing. text imporl Token1»er

f.I-om ke ras.preproCRs sing 1mpot•t sequence f.rom ke ras . ut1ls 1mporf pad\_sequences fPDm keras. ut11s 1mport to\_categor1ca 1 from ke ras. caI1backs iapoi% Early5topp1ng

# Question 2:

Download the Dataset

Solution:

# Dataset Downloaded and uploaded to dnve htt s://www.ka le.com/code/kred 10/sim Ie-lstm-for-text- clas.xification/data

Question 3:

## Read dataset and do pre-processing

Solution:

Read dataset

df = pd.r ead\_csv('›'conte nt/'drive, yDri'›e/spam. csv',delimiter=',',en coding='latin- 1'j

df . head( )

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| v1 | v2 | Unnamed: 2 | Unnamed: 3 | Unnamed: 4 |
| 0 ham | Go until yurong point crazy,. Available only .., | NaN | NaN | NaN |
| 1 ham | Ok lar... Joking wif u oni.. | NaN | NaN | NaN |
| 2 spam | Free entry in 2 a wkly comp ie ‹vin FA Cup fina... | NaN | NaN | NaN |
| 3 ham | U dun say so early hor... U c already then say.., | NaN | NaN | NaN |
| 4 ham | Nah1 don't think he gses to usf, he lives aro... | NaN | NaN | NaN |

### Pre-processing the Dataset

df. drop ( [ ' Unnamed: 2 ” , ’unnamed: 3 ' , unnamed : 4 ' ] , ax1s =1, inp1ace=True) df. 1nfo ( )

RangeI ndex: 5572 entri es, 6 to 5571

##### Data colunns (total 2 colunns ) :

# Column hon- Null Count Dtype

e •i s572 non-null object

1 v2 5572 non-null object

dtypes: object(2)

memory usage: 87.2+ KB

1. df. v2
2. df . v1

1e • Labe1Encoder ( )

v • 1c. f1k\_transfom(Y J

Y ¥.reshape{-1,1)

X\_traln,x\_test,'r\_traln,Y\_test • tra1n\_tcst\_cptG t 'X , Y, test\_s1ze•0.15 j

### eex\_1en - Isa

##### tok • 7oken1zer ( nuo\_nords •eex\_words ’›

sequences • tok . text s\_to\_scquenCes ( x\_traLn )

sequences\_eatrI x • ped\_sequencec ( sequences ,aox Len• esx \_l en)

Inputs • InpuE {nane- " i nput s ' , shape• [ cax\_1cn ] j

layer • Enbcdd1ng(mgx\_words ,50,1nput\_1en@h•wax\_1en) (Inputs I 1syer • LSTH { 6A) ( 1ayen )

layer • Ocnse (2S6, naee• FCI ) ( 1ayer )

1eyer - Act Cvet ton( \* rr 1u' ) I 1eyer ) layer - Dropout (o. s \ (1eyer I

1ayer - Dence ¿ 1, nane• " sut\_ 1ayer’ ) ( 1ayer j layer • Ac t I va t1on( s i g•o I d ) { layer ) atode1 - fJode I [ Input s•Input s , output s • 1ayer)

##### wode1: \* •1 1\*

  &tpux Psra•s

|  |  |  |
| --- | --- | --- |
| 1nput s ( InputLayec ) | [ (None, 15e) | ] |
| eebedd1n$ 1 ( E iedd1ng) | (lone, 150, | 59) |
| 1sM l (LSW!)  FCf (Oense ) | (Mone, 2M) | 1664B |



drspout\_I {Dcopou6)  out\_lmyer {Oense )  act1vet 1on\_3 { Act tvst on) (None, 1)



Tgte1 96, 337

Trs Lnab1e pcrmis : 96, 33 7



2S7







] - lbs 26A/st/ s£0p \ 055 - 6.3182 6CC uP6Cy ‹ ?. 0788 - v6T\_ Tc•ss : O. 15?t - 'v0 J\_6£ 6uP dC y : 9. 9715 36 ' 38 [-  ~~-————-————-—-—- -—-——-———,~~  - 7s 247•s/ step - Nos s ‹ 6. B805 - eccur•c y › O. 97bd - e1\_Los s : 8.6742 - vaS\_ec curecy: 8. 9778



 ~~----~~ ) - 7 237•s/•i\*$ loss: 0.$wO& - •‹<••x<y. $,9O$a \*l\_lo\*x. e.08?g - •\*i \*cc«r <y. o.e$Oi

E poc h J/ 1$t



3e ' 3g ( •= - = • • -- -= - - - • • ~~--~~ - - - • • ] • 7s 242ss.• step • I ass : B. az 28 - oc < ura-c y: O.e'9 47- '.s I Los i : G.T8Ze *• v•I p•c cu r•c y \** e. est E poc h 6 'IN

36a 3-6 [•  ~~---—-—~~ ~~--~~ ~~---—-~~ ~~-—~~ - ~~-—~~ ~~—~~-• ] 7s >^^=•z step Nos s. 6. B178 •c cur•cy 6i.995'S vB} loss : o.e\*gs - v4} accurpc y - e. e ss

3Gy SO ( - ~~-~~ ~~-- --~~ - ~~-~~ ~~-- -~~ ~~- - - --~~ -- ] • 7t 241•s/ atep • loss i 6. B158 - •c cura‹y : 6. 995g • ma L\_Lost : 0 .0g69 • ve1\_ac curac y : 6. 99Gg

E poC h d.•' } 0'



36.' 3e (- ~~-------- ------- -----~~ ••••••••• ! - 7s \*A6a\*/ step loss ‹ 8. 059 - secured y : 0. M68 •-s1\_1oas . e. us4 - vaJ\_eccur ac y : 6. 9769

§poCh 167 16



Savs Th« Uodef

” «›ode1. save ( ' sus c 1 a s s i I s e< . h5 ' )

6hs$«ocescIng ths Teat Dataaat

test\_sequrnces • tok . trxt s\_to\_sequencesI x\_test ›

test\_seqvences\_astr1x pad\_ scquences { t e st\_xcquencrs ,max ten =a ax ten )

Testing ths Modal

acc r t>>de1 . evat uatr i test\_sequence s\_aatrkx , Y\_Eest )

27a' 27 [ • -• •• - - •-- - - - --- - • - • • - - •••---• ] - 1 s 2Ws ’s I e p - I as s: 6. 66B6 - ac c u•ac y : e. 982 I

pctn¥ • Te s t s et ' n Los-t [ : 6. 37) \*.n Ac cu ac y : : e. \*I ' . fo••ost I acc r [e] , ac cr | y ] T )

Test set

cor›: e.ess

*dcc u^ acy :* 0. 9B2