TECNOLÓGICO NACIONAL DE MÉXICO
INSTITUTO TECNOLÓGICO DE TIJUANA
SUBDIRECCIÓN ACADÉMICA

DEPARTAMENTO DE SISTEMAS Y COMPUTACIÓN

SEMESTRE FEBRERO-JUNIO 2022

CARRERA

Ingeniería en informática e Ingeniería en sistemas computacionales.

MATERIA
Datos masivos

TÍTULO
Práctica#6

Integrantes:

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NOMBRE DEL MAESTRO
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Tijuana Baja California 19 de Mayo del 2022

// Linear Support Vector Machine
//Open the spark in the terminal.
// Import the "LinearSVC" library.

```
Welcome to

      ____              __
     / __/__  ___ _____/ /__
    _\ \/ _ \/ _ `/ __/  '_/
   /___/ .__/\_,_/_/ /_/\_\   version 2.4.8
      /_/

Using Scala version 2.11.12 (Java HotSpot(TM) 64-Bit Server VM, Java 1.8.0_311)
Type in expressions to have them evaluated.
Type :help for more information.

scala>

scala> import org.apache.spark.ml.classification.LinearSVC
import org.apache.spark.ml.classification.LinearSVC
```

// Load training data

```
scala> val training  = spark.read.format("libsvm").load("C:/Spark/spark-2.4.8-bin-hadoop2.7/data/mllib/sample_libsvm_data.txt")
22/05/19 13:47:15 WARN LibSVMFileFormat: 'numFeatures' option not specified, determining the number of features by going though the input. If you know the number in advance, please s
pecify it via 'numFeatures' option to avoid the extra scan.
training: org.apache.spark.sql.DataFrame = [label: double, features: vector]
```

//Set the maximum number of iterations and the regularization parameter
// Fit the model

```
scala> val lsvc = new LinearSVC().setMaxIter(10).setRegParam(0.1)
lsvc: org.apache.spark.ml.classification.LinearSVC = linearsvc_431d023fae0f

scala> val lsvcModel = lsvc.fit(training)
22/05/19 13:48:02 WARN BLAS: Failed to load implementation from: com.github.fommil.netlib.NativeSystemBLAS
22/05/19 13:48:02 WARN BLAS: Failed to load implementation from: com.github.fommil.netlib.NativeRefBLAS
lsvcModel: org.apache.spark.ml.classification.LinearSVCModel = linearsvc_431d023fae0f
```

// Print the coefficients and intercept for linear svc

```
scala> println(s"Coefficients: ${lsvcModel.coefficients} Intercept: ${lsvcModel.intercept}")
Coefficients: [0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,-5.170630317473439E-4,-1.172288654973735E-4,-8.882754836918948E-5,8.522360710187464E-5,0.0,0.0,-1.3436361263314267E-5,3.729569801338091E-4,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,8.888949552633658E-4,2.9864059761812683E-4,3.79337881619315 9E-4,-1.762328998254081E-4,0.0,1.5028489269747836E-6,1.8056041144946687E-6,1.8028763260398597E-6,-3.3843713506473646E-6,-4.041580184807502E-6,2.0965017727015125E-6,8.536111642989494E-5,2.2064177429604464E-4,2.2167759994 0575452E-4,-5.472401396558763E-4,0.0,0.0,0.0,0.0,0.0,0.0,0.0,9.21415502407147E-4,3.1351066886882195E-4,2.481984318412822E-4,0.0,-4.147738197636148E-5,-3.6832150384497175E-5,0.0,-3.9652366184583814E-6,-5.1569169804965594E-5,-6.624697287084958E-5,-2.182148650424713E-5,1.163442969067449E-5,-1.1535211416971104E-6,3.8138960488857075E-5,1.5823711634321492E-6,-4.784013432336632E-5,-9.386493224111833E-5,0.0,0.0,0.0,0.0,0.0,0.0,4.3174897827077767E-4,1.7055492867397665E-4,0.0,-2.7978204136148868E-5,-5.88745220385208E-5,-4.1858794529775E-5,-3.740692964881002E-5,-3.9787939304887E-5,-5.545881895011037E-5,-4.505015598421474E-5,-3.214002494749943E-6,-1.6561868808274739E-6,-4.416063987619447E-6,-7.9986183315327E-6,-4.729962112535003E-5,-2.516595625914463E-5,-3.6407809279248066E-5,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,-2.4719098130614967E-4,0.0,-3.270637431382939E-5,-5.5703407875748054E-5,-5.23368921257 02286E-5,-7.829604482365818E-5,-7.60385448387619E-5,-8.371051301348216E-5,-1.8669558753795108E-5,0.0,0.1,2045309486213725E-5,-2.3374084977016397E-5,-1.0788641688879534E-5,-5.5731194431606874E-5,-7.952979033591137E-5,-1.4529196775456057E-5,8.737948348132623E-6,0.0,0.0,0.0,0.0,0.0,0.0,-0.0012589360772978808,-1.816228630214369E-4,-1.0650711664557365E-4,-6.040355527710781E-5,-4.856392973921569E-5,-8.973895954652451E-5,-5.68487774673792E-5,-3.780926734276347E-5,1.3834897036553787E-5,7.585485129441565E-5,5.50174 11816753975E-5,-1.5430755398169695E-5,-1.834928703625931E-5,-1.0354008265646844E-4,-1.3527847721351194E-4,-1.1245007647684532E-4,-2.937391605675056 4E-5,-7.31121784 7336934E-5,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,-2.858228613863785E-4,-1.2998173971449976E-4,-1.478408021316135E-4,-8.203374605865772E-5,-6.5566853200008 32E-5,-5.6392660386580244E-5,-6.995571627330911E-5,-4.664348159856693E-5,-2.3026593698824318E-5,7.39883397 9172035E-5,1.4817176130099997E-4,1.0938317435545486E-4,7.940425167011364E-5,-6.743294804348106E-7,-1.2623302721464762E-4,-1.910387355357616E-4,-1.8611622108961136E-4,-1.2776766254736952E-4,-8.935302806524433E-5,-1.239417230441996E-5,0.0,0.0,0.0,0.0,0.0,0.0,-2.829530831354112E-4,-1.3912189600461263E-4,-1.2593136464577562E-4,-5.964745187930992E-5,-5.360328152341982E-5,-1.0517880662090183E-4,-1.3856124131005022E-4,-7.181032974125911E-5,2.3249038865093483E-6,1.566964269571967E-4,2.3261206954040812E-4,-1.7261638232256968E-4,-1.3857530960270466E-4,-1.396299028868332E-5,-1.5765773982418597E-4,-2.0728798812007546E-4,-1.9106441272002828E-4,-1.2744834161431415E-4,-1.2755611630280015E-4,-5.1885591560478935E-5,0.0,0.0,0.0,0.0,0.0,0.0,-1.590815670234416E-4,-1.216531230287931E-4,-5.623851079809818E-5,-3.877987126382982E-5,-7.550900509956966E-5,-1.0703140005463545E-4,-1.472042813810622 6E-4,-8.781423374509368E-5,7.941655609421792E-5,2.3206354986219992E-4,2.750698234367 2394E-4,2.546722233188043E-4,1.810821666388498E-4,-1.3069916689929984E-5,-1.842374220886751E-4,-1.977540482445517E-4,-1.7722074063670741E-4,-1.487987014723575E-4,-1.1879021431288621E-4,-9.755283887790393E-5,0.0,0.0,0.0,0.0,0.0,0.0,-1.302740311359312E-4,-5.3683030235535024E-5,-1.763120001365687 3E-5,-7.846611034608254E-5,-1.2210076728325 6E-4,-1.7281968533449702E-4,-1.5592346128894157E-4,-5.239579492910452E-5,1.680719343542442E-4,2.893008678654 8053E-4,3.629921493231646E-4,2.958223512266975E-4,2.1770466955449064E-4,-6.40884808188951E-5,-1.9058225556007997E-4,-2.0425138564600712E-4,-1.714903702119E-4,-1.3853486798341369E-4,-1.3018592950855062E-4,-1.1887779512760102E-4,0.0,0.0,0.0,0.0,0.0,0.0,-7.021411112285498E-5,-1.694500843168125E-5,-7.189722824172193E-5,-1.4560828004346436E-4,-1.4935497340563198E-4,-1.9496419340776972E-4,-1.7383743417254187E-4,-3.343882579201069 4E-5,2.86653832794 7017E-4,2.9812321570739803E-4,3.77250607691119E-4,3.211702827486386E-4,2.577995115175486E-4,-1.6627385656703205E-4,-1.8037105851523224E-4,-2.0419356344211325E-4,-1.7962237203420184E-4,-1.3726480883579862E-4,-1.3461014473741762E-4,-1.2264216469164138E-4,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,-0.0015239752514658556,-5.472330865993813E-5,-9.65684394936216E-5,-1.3424729853486994E-4,-1.4727467799568E-4,-1.616270978824712E-4,-1.8458259010029364E-4,-1.9699647135089726E-4,1.3085261294290817E-4,2.943178857107149E-4,3.097773692834126E-4,4.112834769312103E-4,3.411362075703 5025E-4,1.6529945924367265E-4,-2.10654108626 50534E-4,-1.883924081539624E-4,-1.979586414569358E-4,-1.762131187223702E-4,-1.272343622678854E-4,-1.2708161719220297E-4,-1.4812221011889967E-4,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,-0.00114068 0600536578,-1.323467421269896E-4,-1.2904607854274846E-4,-1.4104748544921958E-4,-1.5194605434027872E-4,-2.1104539389774283E-4,-1.7911827582001795E-4,-1.895294 8277194435E-4,2.176757155 2539842E-4,3.0201791656326465E-4,4.002863274397723E-4,4.0322806756364006E-4,4.118077382608461E-4,3.7917405252859545E-6,-1.9886290660234838E-4,-1.9547443112937263E-4,-1.98573482186808
```

//Results

```
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7017E-4,2.9812321570739803E-4,3.77250607691119E-4,3.211702827486386E-4,2.577995115175486E-4,-1.6627385656703205E-4,-1.8037105851523224E-4,-2.0419356344211325E-4,-1.7962237203420184E-4,-1.3726480883579862E-4,-1.3461014473741762E-4,-1.2264216469164138E-4,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,-0.0015239752514658556,-5.472330865993813E-5,-9.65684394936216E-5,-1.3424729853486994E-4,-1.4727467799568E-4,-1.616270978824712E-4,-1.8458259010029364E-4,-1.9699647135089726E-4,1.3085261294290817E-4,2.943178857107149E-4,3.097773692834126E-4,4.112834769312103E-4,3.4113620757035025E-4,1.6529945924367265E-4,-2.10654108626 50534E-4,-1.883924081539624E-4,-1.979586414569358E-4,-1.762131187223702E-4,-1.272343622678854E-4,-1.2708161719220297E-4,-1.4812221011889967E-4,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,-0.00114068 0600536578,-1.323467421269896E-4,-1.2904607854274846E-4,-1.4104748544921958E-4,-1.5194605434027872E-4,-2.1104539389774283E-4,-1.7911827582001795E-4,-1.8952948277194435E-4,2.176757155 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E-5,-5.087837151621504 6E-5,-8.269367590929908 E-8,0.0,1.343453913109921 1E-5,-1.960169021372857 6E-6,-2.852704599049495 4E-5,-7.410332699310603 E-5,-7.132130570080122 E-5,-4.978096118553 6E-5,-6.641505361384578 E-5,-6.962005514093816 E-5,-7.752898158331023 E-5,-1.739360949922502 5E-4,-6.00125294792554 43958,0.0,0.0,0.0,0.0,0.0,2.8794 61393464088E-4,-0.008955538083486 296E-5,-4.856390832327472 5E-5,-4.117920588930435 E-5,-4.359283623112936 E-5,-6.608754161500044 E-5,-2.778263788098720 7E-5,0.0,0.0,0.0,2.8794 61393464088E-4,-0.002895552977785 1255,0.0,0.0,0.0,0.0,0.0,0.0,-1.231211483783739 2E-4,-1.952674791725475 3E-5,-1.699950682996168 8E-5,5.483529414808508 6E-5,-1.1523441 6 32762399E-5,-5.836560452532814 6E-5,-1.237819421652184 8E-4,-1.175070495325465 6E-4,-6.19711523061306 E-5,-5.042009645812091 E-5,-1.405526022365586 6E-4,-1.410330942465528 E-4,-1.9272308238 929396E-4,-4.802489964676616 E-4] Intercept: 0.012911305214513969
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