{

"cells": [

{

"cell\_type": "markdown",

"source": [

"### \*\*Sprint - 1\*\*"

],

"metadata": {

"id": "L4mW2MGixGOc"

}

},

{

"cell\_type": "markdown",

"metadata": {

"id": "tudNkEJLuxmg"

},

"source": [

"Import the necessary packages"

]

},

{

"cell\_type": "code",

"execution\_count": 44,

"metadata": {

"id": "qxCd\_l5Juxmi"

},

"outputs": [],

"source": [

"import matplotlib.pyplot as plt\n",

"from keras.utils import np\_utils\n",

"from tensorflow.keras.datasets import mnist"

]

},

{

"cell\_type": "markdown",

"metadata": {

"id": "fIX1yV3Uuxmk"

},

"source": [

"Load the data"

]

},

{

"cell\_type": "code",

"execution\_count": 45,

"metadata": {

"id": "270Uff9luxmk"

},

"outputs": [],

"source": [

"(X\_train, y\_train), (X\_test, y\_test) = mnist.load\_data()"

]

},

{

"cell\_type": "markdown",

"metadata": {

"id": "YFf-Bp-euxml"

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"source": [

"Data Analysis"

]

},

{

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"execution\_count": 46,

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"id": "ziz5IGXBuxml",

"outputId": "2579bcbb-02e5-4f0c-a914-d4ec2ef6130f"

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{

"output\_type": "stream",

"name": "stdout",

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"(60000, 28, 28)\n",

"(10000, 28, 28)\n"

]

}

],

"source": [

"print(X\_train.shape)\n",

"print(X\_test.shape)"

]

},

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"text/plain": [

"array([[ 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

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" 0, 0],\n",

" [ 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 3,\n",

" 18, 18, 18, 126, 136, 175, 26, 166, 255, 247, 127, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 0, 0, 0, 0, 30, 36, 94, 154, 170,\n",

" 253, 253, 253, 253, 253, 225, 172, 253, 242, 195, 64, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 0, 0, 0, 49, 238, 253, 253, 253, 253,\n",

" 253, 253, 253, 253, 251, 93, 82, 82, 56, 39, 0, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 0, 0, 0, 18, 219, 253, 253, 253, 253,\n",

" 253, 198, 182, 247, 241, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 0, 0, 0, 0, 80, 156, 107, 253, 253,\n",

" 205, 11, 0, 43, 154, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 0, 0, 0, 0, 0, 14, 1, 154, 253,\n",

" 90, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 139, 253,\n",

" 190, 2, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

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" 253, 70, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

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" 241, 225, 160, 108, 1, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 81, 240, 253, 253, 119, 25, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

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" 0, 46, 130, 183, 253, 253, 207, 2, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

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" 148, 229, 253, 253, 253, 250, 182, 0, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 24, 114, 221,\n",

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" [ 0, 0, 0, 0, 0, 0, 0, 0, 23, 66, 213, 253, 253,\n",

" 253, 253, 198, 81, 2, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 0, 0, 18, 171, 219, 253, 253, 253, 253,\n",

" 195, 80, 9, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 55, 172, 226, 253, 253, 253, 253, 244, 133,\n",

" 11, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 136, 253, 253, 253, 212, 135, 132, 16, 0,\n",

" 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0],\n",

" [ 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,\n",

" 0, 0]], dtype=uint8)"

]

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"metadata": {},

"execution\_count": 47

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],

"source": [

"X\_train[0]"

]

},

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"execution\_count": 48,

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"outputId": "d513f457-2345-4bca-9707-e11022acf61c"

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"5"

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},

"metadata": {},

"execution\_count": 48

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],

"source": [

"y\_train[0]"

]

},

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"execution\_count": 49,

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"height": 300

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"id": "\_B-MmO2Vuxmn",

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"text": [

"The label value is 5\n"

]

},

{

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"data": {

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"<matplotlib.image.AxesImage at 0x7f914422b110>"

]

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"metadata": {},

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"data": {

"text/plain": [

"<Figure size 432x288 with 1 Axes>"

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"image/png": },

"metadata": {

"needs\_background": "light"

}

}

],

"source": [

"print(\"The label value is \",y\_train[0])\n",

"plt.imshow(X\_train[0])"

]

},

{

"cell\_type": "code",

"source": [

"print(\"The label value is \",y\_train[1])\n",

"plt.imshow(X\_train[1])"

],

"metadata": {

"colab": {

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"height": 300

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"id": "5q8T3qNUyT3h",

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},

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{

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"name": "stdout",

"text": [

"The label value is 0\n"

]

},

{

"output\_type": "execute\_result",

"data": {

"text/plain": [

"<matplotlib.image.AxesImage at 0x7f91442fc510>"

]

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"metadata": {},

"execution\_count": 50

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{

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"data": {

"text/plain": [

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}

}

]

},

{

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"source": [

"print(\"The label value is \",y\_test[1])\n",

"plt.imshow(X\_test[1])"

],

"metadata": {

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"height": 300

},

"id": "x-iEhpoSyXqZ",

"outputId": "6d6ee0f1-6c68-4530-b021-05ee15db3909"

},

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"name": "stdout",

"text": [

"The label value is 2\n"

]

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{

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]

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"image/png":

},

"metadata": {

"needs\_background": "light"

}

}

]

},

{

"cell\_type": "markdown",

"metadata": {

"id": "JBhnKps\_uxmn"

},

"source": [

"Data Pre-Processing"

]

},

{

"cell\_type": "code",

"execution\_count": 52,

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"id": "i7FjOkGSuxmo"

},

"outputs": [],

"source": [

"X\_train = X\_train.reshape(60000, 28, 28, 1).astype('float32')\n",

"X\_test = X\_test.reshape(10000, 28, 28, 1).astype('float32')"

]

},

{

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"execution\_count": 53,

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"id": "3Jbz8Uiluxmo"

},

"outputs": [],

"source": [

"number\_of\_classes = 10\n",

"Y\_train = np\_utils.to\_categorical(y\_train, number\_of\_classes)\n",

"Y\_test = np\_utils.to\_categorical(y\_test, number\_of\_classes)"

]

},

{

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"execution\_count": 54,

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"id": "6Hb9lC9Duxmp",

"outputId": "96882c00-a960-49c0-b354-2773beb05430"

},

"outputs": [

{

"output\_type": "stream",

"name": "stdout",

"text": [

"After encoding the value 6 of Y\_train[0] become [0. 0. 0. 0. 0. 1. 0. 0. 0. 0.]\n"

]

}

],

"source": [

"print(\"After encoding the value 6 of Y\_train[0] become\", Y\_train[0])"

]

}

],

"metadata": {

"kernelspec": {

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"language": "python",

"name": "python3"

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"language\_info": {

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"version": 3

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"name": "python",

"nbconvert\_exporter": "python",

"pygments\_lexer": "ipython3",

"version": "3.10.8"

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