

## Clean The Dataset

Project Title	Early Detection of Chronic Kidney Disease Using Machine Learning
Team Id	PNT2022TMID36376
Date	10/11/2022

```
{
  "nbformat": 4,
  "nbformat_minor": 0,
  "metadata": {
    "colab": {
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      "collapsed_sections": []
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    "kernelspec": {
      "name": "python3",
      "display_name": "Python 3"
    },
    "language_info": {
      "name": "python"
    }
  },
  "cells": [
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      "source": [
        "***Import Packages***"
      ],
      "metadata": {
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      }
    },
    {
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```

```

"source": [
    "import pandas as pd\n",
    "import numpy as np\n",
    "import matplotlib.pyplot as plt\n",
    "import tensorflow as tf\n",
    "import tensorflow \n",
    "from tensorflow import keras\n",
    "from keras.layers import Dense"
],
"metadata": {
    "id": "g1cJK-FFWwls"
},
"execution_count": 6,
"outputs": []
},
{
    "cell_type": "markdown",
    "source": [
        "***Read dataset**"
    ],
    "metadata": {
        "id": "NNQLo9W0a16N"
    }
},
{
    "cell_type": "code",
    "source": [
        "data =\n        pd.read_csv(\\C:\\Users\\91801\\Desktopchronickidneydisease.csv")\n",
        "print(data)"
    ],
    "metadata": {
        "colab": {
            "base_uri": "https://localhost:8080/"
        },
        "id": "FaV5jfaAa2rL",
        "outputId": "3f8335bb-02ab-40e1-a509-968b9bfa850d"
    },
    "execution_count": 43,
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        {
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            "name": "stdout",
            "text": [
                "      id  age  bp  sg  al  su  rbc  pc\npcc  \\n",
                "0      0  48.0  80.0  1.020  1.0  0.0  NaN  normal

```

[illegible]

```

        "\n",
        "    classification  \n",
        "0          ckd  \n",
        "1          ckd  \n",
        "2          ckd  \n",
        "3          ckd  \n",
        "4          ckd  \n",
        "..         ...  \n",
        "395        notckd \n",
        "396        notckd \n",
        "397        notckd \n",
        "398        notckd \n",
        "399        notckd \n",
        "\n",
        "[400 rows x 26 columns]\n"
    ]
}
]
},
{
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    "source": [
        "***Understanding Data Type and Features***"
    ],
    "metadata": {
        "id": "oeh1diLw0xln"
    }
},
{
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    "source": [
        "print(data.info())"
    ],
    "metadata": {
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            "base_uri": "https://localhost:8080/"
        },
        "id": "1NPeNNkJ06P7",
        "outputId": "edf61760-725f-4220-b83b-06436b168c1f"
    },
    "execution_count": 44,
    "outputs": [
        {
            "output_type": "stream",
            "name": "stdout",
            "text": [

```

```

"<class 'pandas.core.frame.DataFrame'>\n",
"RangeIndex: 400 entries, 0 to 399\n",
"Data columns (total 26 columns):\n",
" #   Column              Non-Null Count  Dtype   \n",
"---  -
" 0   id                   400 non-null   int64   \n",
" 1   age                  391 non-null   float64 \n",
" 2   bp                   388 non-null   float64 \n",
" 3   sg                   353 non-null   float64 \n",
" 4   al                   354 non-null   float64 \n",
" 5   su                   351 non-null   float64 \n",
" 6   rbc                  248 non-null   object  \n",
" 7   pc                   335 non-null   object  \n",
" 8   pcc                  396 non-null   object  \n",
" 9   ba                   396 non-null   object  \n",
" 10  bgr                  356 non-null   float64 \n",
" 11  bu                   381 non-null   float64 \n",
" 12  sc                   383 non-null   float64 \n",
" 13  sod                  313 non-null   float64 \n",
" 14  pot                  312 non-null   float64 \n",
" 15  hemo                 348 non-null   float64 \n",
" 16  pcv                  330 non-null   object  \n",
" 17  wc                   295 non-null   object  \n",
" 18  rc                   270 non-null   object  \n",
" 19  htn                  398 non-null   object  \n",
" 20  dm                   398 non-null   object  \n",
" 21  cad                  398 non-null   object  \n",
" 22  appet               399 non-null   object  \n",
" 23  pe                   399 non-null   object  \n",
" 24  ane                  399 non-null   object  \n",
" 25  classification       400 non-null   object  \n",
"dtypes: float64(11), int64(1), object(14)\n",
"memory usage: 81.4+ KB\n",
"None\n"
]
}
],
{
"cell_type": "markdown",
"source": [
    "**Handling Missing Values**\n",
    "\n",
    "**Remove null values**"
],
"metadata": {

```

```

      "id": "z_CE4RLYgMS-"
    }
  },
  {
    "cell_type": "code",
    "source": [
      "data=data.dropna(how=\"any\")\n",
      "print(data)"
    ],
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          "      id      age      bp      sg      al      su      rbc      pc
pcc  \\n",
          "3        3  48.0  70.0  1.005  4.0  0.0    normal  abnormal
present  \\n",
          "9        9  53.0  90.0  1.020  2.0  0.0    abnormal  abnormal
present  \\n",
          "11       11  63.0  70.0  1.010  3.0  0.0    abnormal  abnormal
present  \\n",
          "14       14  68.0  80.0  1.010  3.0  2.0     normal  abnormal
present  \\n",
          "20       20  61.0  80.0  1.015  2.0  0.0    abnormal  abnormal
notpresent  \\n",
          "...     ...     ...     ...     ...     ...     ...     ...
...  \\n",
          "395     395  55.0  80.0  1.020  0.0  0.0     normal    normal
notpresent  \\n",
          "396     396  42.0  70.0  1.025  0.0  0.0     normal    normal
notpresent  \\n",
          "397     397  12.0  80.0  1.020  0.0  0.0     normal    normal
notpresent  \\n",
          "398     398  17.0  60.0  1.025  0.0  0.0     normal    normal
notpresent  \\n",
          "399     399  58.0  80.0  1.025  0.0  0.0     normal    normal
notpresent  \\n",

```

```

"\n",
"          ba ... pcv      wc   rc   htn   dm   cad appet   pe
ane  \\ \n",
yes  \n",
yes  \n",
no   \n",
no   \n",
yes  \n",
...  \n",
no   \n",
no   \n",
no   \n",
no   \n",
no   \n",
no   \n",

```

		ba	...	pcv	wc	rc	htn	dm	cad	appet	pe
"3	notpresent	...	32	6700	3.9	yes	no	no	poor	yes	
"9	notpresent	...	29	12100	3.7	yes	yes	no	poor	no	
"11	notpresent	...	32	4500	3.8	yes	yes	no	poor	yes	
"14	present	...	16	11000	2.6	yes	yes	yes	poor	yes	
"20	notpresent	...	24	9200	3.2	yes	yes	yes	poor	yes	
"..	...	...	...	...	...	...	...	...	...	...	
"395	notpresent	...	47	6700	4.9	no	no	no	good	no	
"396	notpresent	...	54	7800	6.2	no	no	no	good	no	
"397	notpresent	...	49	6600	5.4	no	no	no	good	no	
"398	notpresent	...	51	7200	5.9	no	no	no	good	no	
"399	notpresent	...	53	6800	6.1	no	no	no	good	no	

```

"\n",
"      classification \n",
"3          ckd \n",
"9          ckd \n",
"11         ckd \n",
"14         ckd \n",
"20         ckd \n",
"..         ... \n",
"395        notckd \n",
"396        notckd \n",
"397        notckd \n",
"398        notckd \n",
"399        notckd \n",
"\n",
"[158 rows x 26 columns]\n"
]
}
]
},
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```

```

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],
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{
  "cell_type": "code",
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    "data['rbc'] = data['rbc'].map({'abnormal':1,'normal':0})\n",
    "data['pc'] = data['pc'].map({'abnormal':1,'normal':0})\n",
    "data['pcc'] = data['pcc'].map({'present':1,'notpresent':0})\n",
    "data['ba'] = data['ba'].map({'present':1,'notpresent':0})\n",
    "data['htn'] = data['htn'].map({'yes':1,'no':0})\n",
    "data['dm'] = data['dm'].map({'yes':1,'no':0})\n",
    "data['cad'] = data['cad'].map({'yes':1,'no':0})\n",
    "data['pe'] = data['pe'].map({'yes':1,'no':0})\n",
    "data['ane'] = data['ane'].map({'yes':1,'no':0})\n",
    "data['appet'] = data['appet'].map({'poor':1,'good':0})\n",
    "data['classification'] =
data['classification'].map({'ckd':1,'notckd':0})\n",
    "data['pcv'] = data['pcv'].astype('int')\n",
    "data['wc'] = data['wc'].astype('int')\n",
    "data['rc'] = data['rc'].astype('float')\n",
    "print(data)"
  ],
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pcv    wc   rc  \\\n",
        "      3    3  48.0  70.0  1.005  4.0  0.0   0   1   1   0  ...
32    6700  3.9  \n",
        "      9    9  53.0  90.0  1.020  2.0  0.0   1   1   1   0  ...
29   12100  3.7  \n",

```



```

"11    11  63.0  70.0  1.010  3.0  0.0    1  1    1  0  ...
32  4500  3.8  \n",
"14    14  68.0  80.0  1.010  3.0  2.0    0  1    1  1  ...
16 11000  2.6  \n",
"20    20  61.0  80.0  1.015  2.0  0.0    1  1    0  0  ...
24  9200  3.2  \n",
"...    ...  ...    ...    ...    ...    ...    ...  ..  ...  ..  ...
...    ...  ...  \n",
"395   395  55.0  80.0  1.020  0.0  0.0    0  0    0  0  ...
47  6700  4.9  \n",
"396   396  42.0  70.0  1.025  0.0  0.0    0  0    0  0  ...
54  7800  6.2  \n",
"397   397  12.0  80.0  1.020  0.0  0.0    0  0    0  0  ...
49  6600  5.4  \n",
"398   398  17.0  60.0  1.025  0.0  0.0    0  0    0  0  ...
51  7200  5.9  \n",
"399   399  58.0  80.0  1.025  0.0  0.0    0  0    0  0  ...
53  6800  6.1  \n",
"\n",
"      htn  dm  cad  appet  pe  ane  classification  \n",
"3      1  0  0      1  1  1      1  \n",
"9      1  1  0      1  0  1      1  \n",
"11     1  1  0      1  1  0      1  \n",
"14     1  1  1      1  1  0      1  \n",
"20     1  1  1      1  1  1      1  \n",
"...    ...  ..  ...    ...  ..  ...    ...  \n",
"395    0  0  0      0  0  0      0  \n",
"396    0  0  0      0  0  0      0  \n",
"397    0  0  0      0  0  0      0  \n",
"398    0  0  0      0  0  0      0  \n",
"399    0  0  0      0  0  0      0  \n",
"\n",
"[158 rows x 26 columns]\n"

```

```

]
}
]
},
{
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  ],
  "metadata": {
    "id": "_HccszsWwGre"
  }
},

```

```

{
  "cell_type": "code",
  "source": [
    "X = data.iloc[:,1:25].values\n",
    "y = data.iloc[:, 25].values"
  ],
  "metadata": {
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  },
  "execution_count": 39,
  "outputs": []
},
{
  "cell_type": "markdown",
  "source": [
    "***Split Train and Test set**"
  ],
  "metadata": {
    "id": "FXofH3PZzMXW"
  }
},
{
  "cell_type": "code",
  "source": [
    "from sklearn.model_selection import train_test_split\n",
    "X_train, X_test, y_train, y_test = train_test_split(X, y, test_size\n",
    "= 0.30,\n",
    "random_state = 121)#101\n",
    "print(\"X train value\")\n",
    "print(X_train)\n",
    "print(\"Y train value\")\n",
    "print(y_train)"
  ],
  "metadata": {
    "colab": {
      "base_uri": "https://localhost:8080/"
    },
    "id": "bPcWZ7szzszC",
    "outputId": "0fe8a5b0-27f7-415a-8b7e-40d7c4b2f5df"
  },
  "execution_count": 41,
  "outputs": [
    {
      "output_type": "stream",
      "name": "stdout",
      "text": [

```

```

        "X train value\n",
        "[[75.    70.    1.02 ... 0.    0.    0.    ]\n",
        " [57.    60.    1.02 ... 0.    0.    0.    ]\n",
        " [66.    70.    1.025 ... 0.    0.    0.    ]\n",
        " ... \n",
        " [58.    80.    1.02 ... 0.    0.    0.    ]\n",
        " [73.    80.    1.02 ... 0.    0.    0.    ]\n",
        " [46.    60.    1.025 ... 0.    0.    0.    ]]\n",
        "Y train value\n",
        "[0 0 0 0 0 1 0 0 0 1 0 1 1 0 0 1 1 0 1 0 0 1 1 1 0 1 1 0 0 0 0 0
0 0 0 0 0\n",
        " 0 0 0 0 1 0 0 0 0 1 0 0 0 0 1 0 1 0 0 1 1 0 1 0 0 0 0 1 0 1 0 1
0 1 0 0 0\n",
        " 0 1 1 0 1 0 0 0 1 0 0 0 1 0 0 0 0 0 1 0 1 1 0 0 0 1 0 0 1 0 0 0
0 0 1 0]\n"
    ]
}
]
}
]
}

```