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`/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarning:`
Pass the following variables as keyword args: x, y. From version 0.12, the only valid positional argument will be ``data``, and passing other arguments without an explicit keyword will result in an error or misinterpretation.
`\n"`

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```

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```

```

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"    title=\"Convert this dataframe to an interactive table.\"\n",
"    style=\"display:none;\">\n",
"  \n",
"  <svg xmlns=\"http://www.w3.org/2000/svg\" height=\"24px\" viewBox=\"0 0 24
24\">\n",

```

```

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2.06.94zm-11 1l8.5 8.5l.94-2.06 2.06-.94-2.06-.94L8.5 2.5l-.94 2.06-2.06.94zm10 10l.94
2.06.94-2.06 2.06-.94-2.06-.94-2.06-.94 2.06-2.06.94z\"/><path d=\"M17.41 7.96l-1.37-
1.37c-.4-.4-.92-.59-1.43-.59-.52 0-1.04-.2-1.43-.59L10.3 9.45l-7.72 7.72c-.78.78-.78 2.05 0
2.83L4 21.41c.39.39.95.59 1.41.59.51 0 1.02-.2 1.41-.59l7.78-7.78 2.81-2.81c.8-.78.8-2.07 0-
2.86zM5.41 20L4 18.59l7.72-7.72 1.47 1.35L5.41 20z\"/>\n",
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" }\n",
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"   cursor: pointer;\n",
"   display: none;\n",
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"   padding: 0 0 0 0;\n",
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" }\n",
"\n",
" .colab-df-convert:hover {\n",

```

```

"    background-color: #E2EBFA;\n",
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0.15);\n",
"    fill: #174EA6;\n",
"  }\n",
"\n",
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"    box-shadow: 0px 1px 3px 1px rgba(0, 0, 0, 0.15);\n",
"    filter: drop-shadow(0px 1px 2px rgba(0, 0, 0, 0.3));\n",
"    fill: #FFFFFF;\n",
"  }\n",
" </style>\n",
"\n",
"  <script>\n",
"    const buttonEl =\n",
"      document.querySelector('#df-29f68cc0-d56a-4b69-97f2-ef17b0354a11\nbutton.colab-df-convert');\n",
"    buttonEl.style.display =\n",
"      google.colab.kernel.accessAllowed ? 'block' : 'none';\n",
"\n",
"    async function convertToInteractive(key) {\n",
"      const element = document.querySelector('#df-29f68cc0-d56a-4b69-97f2-\nef17b0354a11');\n",
"      const dataTable =

```



```

        await google.colab.kernel.invokeFunction('convertToInteractive',\n",
        [key], {});\n",
        if (!dataTable) return;\n",
        "\n",
        const docLinkHtml = 'Like what you see? Visit the ' +\n",
        '<a target="_blank\"
href=https://colab.research.google.com/notebooks/data_table.ipynb>data table
notebook</a>\n",
        + ' to learn more about interactive tables.';\n",
        element.innerHTML = ";\n",
        dataTable['output_type'] = 'display_data';\n",
        await google.colab.output.renderOutput(dataTable, element);\n",
        const docLink = document.createElement('div');\n",
        docLink.innerHTML = docLinkHtml;\n",
        element.appendChild(docLink);\n",
        }\n",
        </script>\n",
        </div>\n",
        </div>\n",
        " "
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  "outputId": "7f49e666-c9e9-41e6-d9b0-38a7226c99a5"  
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},  
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  ],  
}
```

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    "id": "IhrmtVPH3ZI8",
    "outputId": "2ccfb43f-44c3-4f63-dd4d-c86cf128e27b"
  },
  "execution_count": 19,
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      "data": {
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          "CustomerId      0\n",
          "Surname        0\n",
          "CreditScore     0\n",
          "Geography       0\n",
          "Gender          0\n",
          "Age            0\n",
```

```

        "Tenure      0\n",
        "Balance     0\n",
        "NumOfProducts  0\n",
        "HasCrCard     0\n",
        "IsActiveMember  0\n",
        "EstimatedSalary  0\n",
        "Exited       0\n",
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    ]
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        "sns.boxplot(df.CreditScore)"
    ],

```

```

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    "name": "stderr",
    "text": [
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Pass the following variable as a keyword arg: x. From version 0.12, the only valid positional
argument will be `data`, and passing other arguments without an explicit keyword will result in
an error or misinterpretation.\n",
      " FutureWarning\n"
    ]
  },
  {
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    "data": {
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      ]
    },
    "metadata": {},
    "execution_count": 20
  }
]

```

```
},
{
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  "q2=df.CreditScore.quantile(0.75)\n",  
  "q1=df.CreditScore.quantile(0.25)\n",  
  "iqr=q2-q1"  
],  
"metadata": {  
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},  
"execution_count": 21,  
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},  
{  
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  "source": [  
    "up_limit=q2+1.5*iqr\n",  
    "lw_limit=q1-1.5*iqr"  
  ],  
  "metadata": {  
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  },  
  "execution_count": 22,  
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},  
{  
  "cell_type": "code",  
  "source": [  
    "df.median()"br/>  ],  
  "metadata": {
```



```
"colab": {
  "base_uri": "https://localhost:8080/"
},
"id": "XJG54lou7Sh0",
"outputId": "a2535455-4550-4604-9755-802f6d750e18"
},
"execution_count": 23,
```

```
"outputs": [
  {
    "output_type": "stream",
    "name": "stderr",
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```

```
      "/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:1: FutureWarning:
Dropping of nuisance columns in DataFrame reductions (with 'numeric_only=None') is
deprecated; in a future version this will raise TypeError.  Select only valid columns before calling
the reduction.\n",
```

```
      " \\\"\\\"Entry point for launching an IPython kernel.\n"
```

```
    ]
```

```
  },
```

```
  {
```

```
    "output_type": "execute_result",
```

```
    "data": {
```

```
      "text/plain": [
```

```
        "RowNumber      5.000500e+03\n",
```

```
        "CustomerId     1.569074e+07\n",
```

```
        "CreditScore    6.520000e+02\n",
```

```
        "Age            3.700000e+01\n",
```

```
        "Tenure         5.000000e+00\n",
```

```
        "Balance        9.719854e+04\n",
```

```
        "NumOfProducts  1.000000e+00\n",
```

```

        "HasCrCard      1.000000e+00\n",
        "IsActiveMember 1.000000e+00\n",
        "EstimatedSalary 1.001939e+05\n",
        "Exited         0.000000e+00\n",
        "dtype: float64"
    ]
},
"metadata": {},
"execution_count": 23
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]
},
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    "source": [
        "df['CreditScore']=np.where(df['CreditScore']<lw_limit,652,df['CreditScore'])"
    ],
    "metadata": {
        "id": "noLx9qGZ7br2"
    },
    "execution_count": 24,
    "outputs": []
},
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    "cell_type": "code",
    "source": [
        "sns.boxplot(df.CreditScore)"
    ],
    "metadata": {

```

```

"colab": {
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  "height": 351
},
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"outputId": "ffe548fc-6c2b-4741-c858-6bf5ccdcf95e"
},
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    "output_type": "stream",
    "name": "stderr",
    "text": [
      "/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarning:
Pass the following variable as a keyword arg: x. From version 0.12, the only valid positional
argument will be `data`, and passing other arguments without an explicit keyword will result in
an error or misinterpretation.\n",
      " FutureWarning\n"
    ]
  },
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    "data": {
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      ]
    },
    "metadata": {},
    "execution_count": 25
  },

```

[illegible]

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```
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    }  
  }  
]  
},  
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    "7.PERFORM EMCODING"  
  ],  
  "metadata": {  
    "id": "cBcGd4857m90"  
  }  
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```

```

{
  "cell_type": "code",
  "source": [
    "from sklearn.preprocessing import LabelEncoder\n",
    "le=LabelEncoder()"
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  "metadata": {
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  "execution_count": 26,
  "outputs": []
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  "cell_type": "code",
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    "df.Surname=le.fit_transform(df.Surname)\n",
    "df.Geography=le.fit_transform(df.Age)\n",
    "df.Gender=le.fit_transform(df.Gender)\n",
    "df.head()"
  ],
  "metadata": {
    "colab": {
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      "height": 270
    },
    "id": "e6Bul6bx9TFM",
    "outputId": "9f2fbda6-13f2-445e-fbc0-306db96c0bce"
  },
  "execution_count": 27,

```

```

"outputs": [
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  "data": {
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      " RowNumber CustomerId Surname CreditScore Geography Gender Age \\\n",
      "0      1  15634602  1115      619      24      0  42 \n",
      "1      2  15647311  1177      608      23      0  41 \n",
      "2      3  15619304  2040      502      24      0  42 \n",
      "3      4  15701354   289      699      21      0  39 \n",
      "4      5  15737888  1822      850      25      0  43 \n",
      "\n",
      " Tenure  Balance NumOfProducts HasCrCard IsActiveMember \\\n",
      "0      2    0.00          1      1          1 \n",
      "1      1 83807.86          1      0          1 \n",
      "2      8 159660.80          3      1          0 \n",
      "3      1    0.00          2      0          0 \n",
      "4      2 125510.82          1      1          1 \n",
      "\n",
      " EstimatedSalary Exited \n",
      "0    101348.88      1 \n",
      "1    112542.58      0 \n",
      "2    113931.57      1 \n",
      "3     93826.63      0 \n",
      "4     79084.10      0 "
    ],
    "text/html": [
      "\n",
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```

```
" <div class=\"colab-df-container\">\n",
" <div>\n",
"<style scoped>\n",
" .dataframe tbody tr th:only-of-type {\n",
"   vertical-align: middle;\n",
" } \n",
"\n",
" .dataframe tbody tr th {\n",
"   vertical-align: top;\n",
" } \n",
"\n",
" .dataframe thead th {\n",
"   text-align: right;\n",
" } \n",
"</style>\n",
"<table border=\"1\" class=\"dataframe\">\n",
" <thead>\n",
" <tr style=\"text-align: right;\">\n",
" <th></th>\n",
" <th>RowNumber</th>\n",
" <th>CustomerId</th>\n",
" <th>Surname</th>\n",
" <th>CreditScore</th>\n",
" <th>Geography</th>\n",
" <th>Gender</th>\n",
" <th>Age</th>\n",
" <th>Tenure</th>\n",
" <th>Balance</th>\n",
" <th>NumOfProducts</th>
```



```
"    <th>HasCrCard</th>\n",
"    <th>IsActiveMember</th>\n",
"    <th>EstimatedSalary</th>\n",
"    <th>Exited</th>\n",
"  </tr>\n",
" </thead>\n",
" <tbody>\n",
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"     <td>1115</td>\n",
"     <td>619</td>\n",
"     <td>24</td>\n",
"     <td>0</td>\n",
"     <td>42</td>\n",
"     <td>2</td>\n",
"     <td>0.00</td>\n",
"     <td>1</td>\n",
"     <td>1</td>\n",
"     <td>1</td>\n",
"     <td>101348.88</td>\n",
"     <td>1</td>\n",
"   </tr>\n",
"   <tr>\n",
"     <th>1</th>\n",
"     <td>2</td>\n",
"     <td>15647311</td>\n",
"     <td>1177</td>
```

```
"    <td>608</td>\n",
"    <td>23</td>\n",
"    <td>0</td>\n",
"    <td>41</td>\n",
"    <td>1</td>\n",
"    <td>83807.86</td>\n",
"    <td>1</td>\n",
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"    <td>0</td>\n",
"  </tr>\n",
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"    <td>2040</td>\n",
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"    <td>0</td>\n",
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"    <td>1</td>\n",
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```

```
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" <td>15701354</td>\n",
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" <td>699</td>\n",
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" <th>4</th>\n",
" <td>5</td>\n",
" <td>15737888</td>\n",
" <td>1822</td>\n",
" <td>850</td>\n",
" <td>25</td>\n",
" <td>0</td>\n",
" <td>43</td>\n",
" <td>2</td>\n",
" <td>125510.82</td>\n",
" <td>1</td>\n"
```

```

"    <td>1</td>\n",
"    <td>1</td>\n",
"    <td>79084.10</td>\n",
"    <td>0</td>\n",
"  </tr>\n",
" </tbody>\n",
"</table>\n",
"</div>\n",
"  <button class=\"colab-df-convert\" onclick=\"convertToInteractive('df-2ce361d4-
c1b3-4da4-98f3-540b22c3f95e')\" \n",
"    title=\"Convert this dataframe to an interactive table.\" \n",
"    style=\"display:none;\">\n",
"  \n",
" <svg xmlns=\"http://www.w3.org/2000/svg\" height=\"24px\" viewBox=\"0 0 24
24\" \n",
"    width=\"24px\">\n",
"  <path d=\"M0 0h24v24H0V0z\" fill=\"none\"/>\n",
"  <path d=\"M18.56 5.44l.94 2.06.94-2.06.94-2.06.94-2.06.94 2.06-
2.06.94zm-11 1l8.5 8.5l.94-2.06 2.06-.94L8.5 2.5l-.94 2.06-2.06.94zm10 10l.94
2.06.94-2.06 2.06-.94-2.06-.94.94-2.06.94 2.06-2.06.94z\"/><path d=\"M17.41 7.96l-1.37-
1.37c-.4-.4-.92-.59-1.43-.59-.52 0-1.04.2-1.43.59L10.3 9.45l-7.72 7.72c-.78.78-.78 2.05 0
2.83L4 21.41c.39.39.95 1.41.59.51 0 1.02-.2 1.41-.59l7.78-7.78 2.81-2.81c.8-.78.8-2.07 0-
2.86zM5.41 20L4 18.59l7.72-7.72 1.47 1.35L5.41 20z\"/>\n",
" </svg>\n",
" </button>\n",
"  \n",
" <style>\n",
"  .colab-df-container {\n",
"    display:flex;\n",
"    flex-wrap:wrap;\n",
"    gap: 12px;\n",
"  }\n",

```

```
"\n",
"  .colab-df-convert {\n",
"    background-color: #E8FOFE;\n",
"    border: none;\n",
"    border-radius: 50%;\n",
"    cursor: pointer;\n",
"    display: none;\n",
"    fill: #1967D2;\n",
"    height: 32px;\n",
"    padding: 0 0 0 0;\n",
"    width: 32px;\n",
"  }\n",
"\n",
"  .colab-df-convert:hover {\n",
"    background-color: #E2EBFA;\n",
"    box-shadow: 0px 1px 2px rgba(60, 64, 67, 0.3), 0px 1px 3px 1px rgba(60, 64, 67,
0.15);\n",
"    fill: #174EA6;\n",
"  }\n",
"\n",
"  [theme=dark] .colab-df-convert {\n",
"    background-color: #3B4455;\n",
"    fill: #D2E3FC;\n",
"  }\n",
"\n",
"  [theme=dark] .colab-df-convert:hover {\n",
"    background-color: #434B5C;\n",
"    box-shadow: 0px 1px 3px 1px rgba(0, 0, 0, 0.15);\n",
"    filter: drop-shadow(0px 1px 2px rgba(0, 0, 0, 0.3));\n",
```

```

"    fill: #FFFFFF;\n",

"  }\n",

" </style>\n",

"\n",

"    <script>\n",

"      const buttonEl =\n",

"        document.querySelector('#df-2ce361d4-c1b3-4da4-98f3-540b22c3f95e-540b22c3f95e');\n",

"      buttonEl.style.display =\n",

"        google.colab.kernel.accessAllowed ? 'block' : 'none';\n",

"\n",

"      async function convertToInteractive(key) {\n",

"        const element = document.querySelector('#df-2ce361d4-c1b3-4da4-98f3-540b22c3f95e');\n",

"        const dataTable =\n",

"          await google.colab.kernel.invokeFunction('convertToInteractive',\n",

"            [key], {});\n",

"        if (!dataTable) return;\n",

"\n",

"        const docLinkHtml = 'Like what you see? Visit the ' +\n",

"          '<a target=\"_blank\" href=https://colab.research.google.com/notebooks/data_table.ipynb>data table notebook</a>'\n",

"          + ' to learn more about interactive tables.';\n",

"        element.innerHTML = \"\n",

"          dataTable['output_type'] = 'display_data';\n",

"          await google.colab.output.renderOutput(dataTable, element);\n",

"          const docLink = document.createElement('div');\n",

"          docLink.innerHTML = docLinkHtml;\n",

"          element.appendChild(docLink);\n",

```

```

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        "    </script>\n",
        "    </div>\n",
        " </div>\n",
        " "
    ]
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"execution_count": 27
}
]
},
{
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        "plt.figure(figsize=[10,10])\n",
        "sns.heatmap(df.corr(),annot=True)"
    ],
    "metadata": {
        "colab": {
            "base_uri": "https://localhost:8080/",
            "height": 684
        },
        "id": "eKG9CqNb9cRc",
        "outputId": "7e5a5113-6e0b-4fcd-fefb-66963cc69f8d"
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    "outputs": [
        {

```

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  ]

},

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},

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  "output_type": "display_data",

  "data": {

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    ],

    "image/png":

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wzgjQNW1AWkoqi0LnYli7gp19FYYtisCteUO2/xjFislfmPZpG+jD8yE9kRJSEpP46/s/eXF0b3RW0v4
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"8.SPLIT DATA INTO DEPENDENT AND INDEPENDENT VARIABLES\n"

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        "3     93826.63\n",
        "4     79084.10\n",
        "    ...   \n",
        "9995   96270.64\n",
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"\n",
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"2      8 159660.80           3      1           0      1  \n",
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"  }\n",
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" <th>Gender</th>\n",
" <th>Age</th>\n",
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" <th>Balance</th>\n",
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"  </svg>\n",
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"  }\n",
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0.15);\n",
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"  }\n",
"\n",
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"    background-color: #3B4455;\n",
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```

"    fill: #D2E3FC;\n",
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"    filter: drop-shadow(0px 1px 2px rgba(0, 0, 0, 0.3));\n",
"    fill: #FFFFFF;\n",
"  }\n",
" </style>\n",
"\n",
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button.colab-df-convert');\n",
"    buttonEl.style.display =\n",
"      google.colab.kernel.accessAllowed ? 'block' : 'none';\n",
"\n",
"\n",
"    async function convertToInteractive(key) {\n",
"      const element = document.querySelector('#df-55ee4442-5843-4818-ac09-\n",
56f140be1ad1');\n",
"      const dataTable =\n",
"        await google.colab.kernel.invokeFunction('convertToInteractive',\n",
"          [key], {});\n",
"      if (!dataTable) return;\n",
"\n",
"      const docLinkHtml = 'Like what you see? Visit the ' +\n",
"        '<a target=\"_blank\"\n",
href=https://colab.research.google.com/notebooks/data_table.ipynb>data table\n",
notebook</a>'\n",

```

```

        + ' to learn more about interactive tables.';\n",
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"1 -1.731531 -0.606534 -0.390911 -0.447572 0.198387 -1.095988 \n",
"2 -1.731185 -0.995885 0.628988 -1.551792 0.293793 -1.095988 \n",
"3 -1.730838 0.144767 -1.440356 0.500391 0.007575 -1.095988 \n",
"4 -1.730492 0.652659 0.371354 2.073384 0.389199 -1.095988 \n",
"\n",
" Age Tenure Balance NumOfProducts HasCrCard IsActiveMember \\n",
"0 0.293517 -1.041760 -1.225848 -0.911583 0.646092 0.970243 \n",
"1 0.198164 -1.387538 0.117350 -0.911583 -1.547768 0.970243 \n",
"2 0.293517 1.032908 1.333053 2.527057 0.646092 -1.030670 \n",
"3 0.007457 -1.387538 -1.225848 0.807737 -1.547768 -1.030670 \n",
"4 0.388871 -1.041760 0.785728 -0.911583 0.646092 0.970243 \n",
"\n",
" Exited \n",
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" .dataframe tbody tr th:only-of-type {\n",
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```

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"\n",
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"  }\n",
"\n",
"  .dataframe thead th {\n",
"    text-align: right;\n",
"  }\n",
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"      <th>Geography</th>\n",
"      <th>Gender</th>\n",
"      <th>Age</th>\n",
"      <th>Tenure</th>\n",
"      <th>Balance</th>\n",
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"     <td>-1.041760</td>\n",
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"     <td>0.117350</td>
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2.06.94-2.06 2.06-.94-2.06-.94-.94-2.06-.94 2.06-2.06.94z\"/><path d=\"M17.41 7.96l-1.37-
1.37c-.4-.4-.92-.59-1.43-.59-.52 0-1.04.2-1.43.59L10.3 9.45l-7.72 7.72c-.78.78-.78 2.05 0
2.83L4 21.41c.39.39.95.59 1.41.59.51 0 1.02-.2 1.41-.59l7.78-7.78 2.81-2.81c.8-.78.8-2.07 0-
2.86zM5.41 20L4 18.59l7.72-7.72 1.47 1.35L5.41 20z\"/>\\n\",
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"             cursor: pointer;\\n\",
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"             fill: #1967D2;\\n\",
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```

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    "    async function convertToInteractive(key) {\n",
    "        const element = document.querySelector('#df-813b7426-1acb-4ec2-b623-8ca69c463beb');\n",
    "        const dataTable =\n",
    "            await google.colab.kernel.invokeFunction('convertToInteractive',\n",
    "                [key], {});\n",
    "        if (!dataTable) return;\n",
    "        \n",
    "        const docLinkHtml = 'Like what you see? Visit the ' +\n",
    "            '<a target=\"_blank\" href=https://colab.research.google.com/notebooks/data_table.ipynb>data table notebook</a>'\n",
    "            + ' to learn more about interactive tables.';\n",
    "        element.innerHTML = \"\n",
    "            dataTable['output_type'] = 'display_data';\n",
    "            await google.colab.output.renderOutput(dataTable, element);\n",
    "            const docLink = document.createElement('div');\n",
    "            docLink.innerHTML = docLinkHtml;\n",
    "            element.appendChild(docLink);\n",
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