

Project development phase (delivery)

Splint2

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"nbformat_minor": 0,  
"metadata": {  
  "colab": {  
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  },  
  "kernelspec": {  
    "name": "python3",  
    "display_name": "Python 3"  
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  "language_info": {  
    "name": "python"  
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},  
"cells": [  
  {  
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    "source": [  
      "# Basic Python"  
    ],  
    "metadata": {  
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    }  
  },  
  {  
    "cell_type": "markdown",
```

```
    "source": [  
      "## 1. Split this string"  
    ],  
    "metadata": {  
      "id": "CU48hgo4Owz5"  
    }  
  },  
  {  
    "cell_type": "code",  
    "source": [  
      "s = \"Hi there Sam!\""  
    ],  
    "metadata": {  
      "id": "s07c7JK7Oqt-"  
    },  
    "execution_count": 2,  
    "outputs": []  
  },  
  {  
    "cell_type": "code",  
    "source": [  
      "print(s.split())"  
    ],  
    "metadata": {  
      "id": "6mGVa3SQYLkb",  
      "outputId": "c7eca547-4108-4061-c951-ee5b4c17722c",  
      "colab": {  
        "base_uri": https://localhost:8080/  
      }  
    }
```

```

},
"execution_count": 3,
"outputs": [
  {
    "output_type": "stream",
    "name": "stdout",
    "text": [
      "['Hi', 'there', 'Sam!']\n"
    ]
  }
],
},
{
  "cell_type": "markdown",
  "source": [
    "## 2. Use .format() to print the following string. \n",
    "\n",
    "### Output should be: The diameter of Earth is 12742 kilometers."
  ],
  "metadata": {
    "id": "GH1QBn8HP375"
  }
},
{
  "cell_type": "code",
  "source": [
    "planet = \"Earth\"\n",
    "diameter = 12742"
  ],

```

```
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      "id": "_ZHoml3kPqic"
    },
    "execution_count": 4,
    "outputs": []
  },
  {
    "cell_type": "code",
    "source": [
      "print(f\"The diameter of Earth is {diameter} kilometers.\")"
    ],
    "metadata": {
      "id": "HyRyJv6CYPb4",
      "outputId": "14daa2e3-a1d3-4a04-d1ef-7d54e04de95b",
      "colab": {
        "base_uri": https://localhost:8080/
      }
    },
    "execution_count": 7,
    "outputs": [
      {
        "output_type": "stream",
        "name": "stdout",
        "text": [
          "The diameter of Earth is 12742 kilometers.\n"
        ]
      }
    ]
  },
}
```

```

{
  "cell_type": "markdown",
  "source": [
    "## 3. In this nest dictionary grab the word \"hello\""
  ],
  "metadata": {
    "id": "KE74ZEwkRExZ"
  }
},
{
  "cell_type": "code",
  "source": [
    "d = {'k1':[1,2,3,{'tricky':['oh','man','inception',{'target':[1,2,3,'hello']}]}]}"
  ],
  "metadata": {
    "id": "fcVwbCc1QrQl"
  },
  "execution_count": 8,
  "outputs": []
},
{
  "cell_type": "code",
  "source": [
    "print(d['k1'][3]['tricky'][3]['target'][3])"
  ],
  "metadata": {
    "id": "MvbkMZpXYRaw",
    "outputId": "0b2deb79-1250-4d1b-be1e-560a73b2cb37",
    "colab": {

```

```
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  }
},
"execution_count": 9,
"outputs": [
  {
    "output_type": "stream",
    "name": "stdout",
    "text": [
      "hello\n"
    ]
  }
],
},
{
  "cell_type": "markdown",
  "source": [
    "# Numpy"
  ],
  "metadata": {
    "id": "bw0vVp-9ddjv"
  }
},
{
  "cell_type": "code",
  "source": [
    "import numpy as np"
  ],
  "metadata": {
```

```
    "id": "LLiE_TYrhA1O"
  },
  "execution_count": 10,
  "outputs": []
},
{
  "cell_type": "markdown",
  "source": [
    "## 4.1 Create an array of 10 zeros? \n",
    "## 4.2 Create an array of 10 fives?"
  ],
  "metadata": {
    "id": "wOg8hinbgx30"
  }
},
{
  "cell_type": "code",
  "source": [
    "zeros=np.zeros(10)"
  ],
  "metadata": {
    "id": "NHrirmgCYXvU"
  },
  "execution_count": 11,
  "outputs": []
},
{
  "cell_type": "code",
  "source": [
```

```

    "fives=np.full(10,5)\n",
    "print(zeros,fives)"
],
"metadata": {
    "id": "e4005lsTYXxx",
    "outputId": "0f2ef939-1168-496d-b3fc-6d1e6be7b190",
    "colab": {
        "base_uri": https://localhost:8080/
    }
},
"execution_count": 15,
"outputs": [
    {
        "output_type": "stream",
        "name": "stdout",
        "text": [
            "[0. 0. 0. 0. 0. 0. 0. 0. 0. 0.] [5 5 5 5 5 5 5 5 5 5]\n"
        ]
    }
],
},
{
    "cell_type": "markdown",
    "source": [
        "## 5. Create an array of all the even integers from 20 to 35"
    ],
    "metadata": {
        "id": "gZHHDUBvrMX4"
    }
}

```



```
},
{
  "cell_type": "code",
  "source": [
    "arr=[l for l in range(20,35+1) if i%2==0]\\n",
    "arr"
  ],
  "metadata": {
    "id": "oAl2tbU2Yag-",
    "outputId": "b53dd299-7197-43d0-8d62-4bf0e840c885",
    "colab": {
      "base_uri": https://localhost:8080/
    }
  },
  "execution_count": 16,
  "outputs": [
    {
      "output_type": "execute_result",
      "data": {
        "text/plain": [
          "[20, 22, 24, 26, 28, 30, 32, 34]"
        ]
      },
      "metadata": {},
      "execution_count": 16
    }
  ],
},
{
```

```

"cell_type": "markdown",
"source": [
    "## 6. Create a 3x3 matrix with values ranging from 0 to 8"
],
"metadata": {
    "id": "NaOM308NsRpZ"
}
},
{
    "cell_type": "code",
    "source": [
        "array=np.arange(0,9).reshape((3,3))\n",
        "array"
    ],
    "metadata": {
        "id": "tOIEVH7BYceE",
        "outputId": "a8144bde-e4e9-46ac-f89b-22306e71c7bd",
        "colab": {
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        }
    },
    "execution_count": 20,
    "outputs": [
        {
            "output_type": "execute_result",
            "data": {
                "text/plain": [
                    "array([[0, 1, 2],\n",
                    "       [3, 4, 5],\n",

```

```

        "    [6, 7, 8]]]"
    ]
},
"metadata": {},
"execution_count": 20
}
]
},
{
    "cell_type": "markdown",
    "source": [
        "## 7. Concatenate a and b \n",
        "## a = np.array([1, 2, 3]), b = np.array([4, 5, 6])"
    ],
    "metadata": {
        "id": "hQ0dnhAQuU_p"
    }
},
{
    "cell_type": "code",
    "source": [
        "a = np.array([1, 2, 3])\n",
        "b = np.array([4, 5, 6])\n",
        "c=np.concatenate((a,b))\n",
        "c"
    ],
    "metadata": {
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        "data": {
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            "array([1, 2, 3, 4, 5, 6])"
          ]
        },
        "metadata": {},
        "execution_count": 27
      }
    ],
    {
      "cell_type": "markdown",
      "source": [
        "# Pandas"
      ],
      "metadata": {
        "id": "dIPEY9DRwZga"
      }
    },
    {
      "cell_type": "markdown",
```

```

"source": [
  "## 8. Create a dataframe with 3 rows and 2 columns"
],
"metadata": {
  "id": "ijoYW51zwr87"
},
{
  "cell_type": "code",
  "source": [
    "import pandas as pd\n"
  ],
  "metadata": {
    "id": "T5OxJRZ8uvR7"
  },
  "execution_count": 28,
  "outputs": []
},
{
  "cell_type": "code",
  "source": [
    "d={'name':['raj','jhon','joe'],'age':[21,26,28]}\n",
    "df=pd.DataFrame.from_dict(d)\n",
    "df"
  ],
  "metadata": {
    "id": "xNpl_XXoYhs0",
    "outputId": "a7f76b6e-5834-4ec2-b583-bf08743f9a28",
    "colab": {

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    {
      "output_type": "execute_result",
      "data": {
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          "  name age\n",
          "0  raj  21\n",
          "1  jhon 26\n",
          "2  joe  28"
        ],
        "text/html": [
          "\n",
          "<div id=\"df-598e9ee5-fb74-4a51-acc5-099517bc009e\">\n",
          "<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",
          "\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>name</th>\n",
"     <th>age</th>\n",
"   </tr>\n",
" </thead>\n",
" <tbody>\n",
"   <tr>\n",
"     <th>0</th>\n",
"     <td>raj</td>\n",
"     <td>21</td>\n",
"   </tr>\n",
"   <tr>\n",
"     <th>1</th>\n",
"     <td>jhon</td>\n",
"     <td>26</td>\n",
"   </tr>\n",
"   <tr>\n",
"     <th>2</th>\n",
"     <td>joe</td>\n",
"     <td>28</td>\n",
"   </tr>\n",
" </tbody>\n",
```

```

"</table>\n",
"</div>\n",
"  <button class=\"colab-df-convert\" onclick=\"convertToInteractive('df-598e9ee5-fb74-4a51-acc5-099517bc009e')\" \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 2.06-.94-2.06-.94-.94-2.06-.94 2.06-2.06.94zm-11 11L8.5 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-.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.39.39.9.59 1.41.59.51 0 1.02-.2 1.41-.59l7.78-7.78 2.81-2.81c-.8-.78-.8-2.07 0-2.86z\"M5.41 20L4 18.59l7.72-7.72 1.47 1.35L5.41 20z\"/>\n",
"  </svg>\n",
"  </button>\n",
"  \n",
"  <style>\n",
"    .colab-df-container {\n",
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"      flex-wrap: wrap;\n",
"      gap: 12px;\n",
"    }\n",
"  \n",
"  .colab-df-convert {\n",
"    background-color: #E8F0FE;\n",
"    border: none;\n",
"    border-radius: 50%;\n",
"    cursor: pointer;\n",

```



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“ fill: #1967D2;\n”,
“ height: 32px;\n”,
“ padding: 0 0 0 0;\n”,
“ width: 32px;\n”,
“ }\n”,
“\n”,
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“ 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-598e9ee5-fb74-4a51-acc5-099517bc009e button.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-598e9ee5-fb74-4a51-acc5-
099517bc009e');\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",
        "    }\n",
        "    </script>\n",
        "    </div>\n",
        "    </div>\n",
        "    "
    ]
},

```

```

    "metadata": {},
    "execution_count": 34
  }
]
},
{
  "cell_type": "markdown",
  "source": [
    "## 9. Generate the series of dates from 1st Jan, 2023 to 10th Feb, 2023"
  ],
  "metadata": {
    "id": "UXSmdNclyJQD"
  }
},
{
  "cell_type": "code",
  "source": [
    "date=pd.date_range(\"01-01-2023\", \"10-02-2023\", freq=\"D\")"
  ],
  "metadata": {
    "id": "dgyC0JhVYl4F",
    "outputId": "187fb707-db6f-42fa-d730-c96366dfadae",
    "colab": {
      "base_uri": https://localhost:8080/
    }
  },
  "execution_count": 35,
  "outputs": [
    {

```

```

"output_type": "execute_result",
"data": {
  "text/plain": [
    "DatetimeIndex(['2023-01-01', '2023-01-02', '2023-01-03', '2023-01-04',\n",
    "                '2023-01-05', '2023-01-06', '2023-01-07', '2023-01-08',\n",
    "                '2023-01-09', '2023-01-10',\n",
    "                ...\n",
    "                '2023-09-23', '2023-09-24', '2023-09-25', '2023-09-26',\n",
    "                '2023-09-27', '2023-09-28', '2023-09-29', '2023-09-30',\n",
    "                '2023-10-01', '2023-10-02'],\n",
    "              dtype='datetime64[ns]', length=275, freq='D')"
```

],
 },
 "metadata": {},
 "execution_count": 35
 }
]
},
{
 "cell_type": "markdown",
 "source": [
 "## 10. Create 2D list to DataFrame\n",
 "\n",
 "lists = [[1, 'aaa', 22],\n",
 " [2, 'bbb', 25],\n",
 " [3, 'ccc', 24]]"
],
 "metadata": {
 "id": "ZizSetD-y5az"
 }
}

```

    }
  },
  {
    "cell_type": "code",
    "source": [
      "lists = [[1, 'aaa', 22], [2, 'bbb', 25], [3, 'ccc', 24]]"
    ],
    "metadata": {
      "id": "_XMC8aEt0IIB"
    },
    "execution_count": 36,
    "outputs": []
  },
  {
    "cell_type": "code",
    "source": [
      "df=pd.DataFrame(lists,columns=[\"C1\\\", \"C2\\\", \"C3\\\"])\n",
      "df"
    ],
    "metadata": {
      "id": "knH76sDKYsVX",
      "outputId": "1f47a5ef-d884-493b-85a7-4e462c85d335",
      "colab": {
        "base_uri": https://localhost:8080/,
        "height": 143
      }
    },
    "execution_count": 38,
    "outputs": [

```

```
{
  "output_type": "execute_result",
  "data": {
    "text/plain": [
      " C1 C2 C3\n",
      "0 1 aaa 22\n",
      "1 2 bbb 25\n",
      "2 3 ccc 24"
    ],
    "text/html": [
      "\n",
      " <div id=\"df-fef6f28e-9431-4092-82cd-da1a9e44b091\">\n",
      "   <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>C1</th>\n",
" <th>C2</th>\n",
" <th>C3</th>\n",
" </tr>\n",
" </thead>\n",
" <tbody>\n",
" <tr>\n",
" <th>0</th>\n",
" <td>1</td>\n",
" <td>aaa</td>\n",
" <td>22</td>\n",
" </tr>\n",
" <tr>\n",
" <th>1</th>\n",
" <td>2</td>\n",
" <td>bbb</td>\n",
" <td>25</td>\n",
" </tr>\n",
" <tr>\n",
" <th>2</th>\n",
" <td>3</td>\n",
" <td>ccc</td>\n",
" <td>24</td>\n",
" </tr>\n",
" </tbody>\n",
"</table>\n",
"</div>\n",
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```

    "    <button class=\"colab-df-convert\" onclick=\"convertToInteractive('df-fef6f28e-9431-4092-82cd-da1a9e44b091')\"\\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 2.06-.94-2.06-.94-.94-2.06-.94 2.06-2.06.94zm-11 11.85l.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-.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.39.39.9.59 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\",
    " </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: #E8F0FE;\\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-fef6f28e-9431-4092-82cd-da1a9e44b091 button.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-fef6f28e-9431-4092-82cd-
da1a9e44b091');\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",
        "    }\n",
        "    </script>\n",
        "    </div>\n",
        "    </div>\n",
        "    "
    ]
},
"metadata": {},
"execution_count": 38

```

```
    }  
  ]  
},  
{  
  "cell_type": "code",  
  "source": [],  
  "metadata": {  
    "id": "5xEVQXkjMsDS"  
  },  
  "execution_count": null,  
  "outputs": []  
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}
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