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      "display_name": "Python 3"
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    "language_info": {
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      "source": [
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      "metadata": {
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    {
      "cell_type": "markdown",
      "source": [
```

```
    "## 1. Split this string"
  ],
  "metadata": {
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    "s = \"Hi there Sam!\""
  ],
  "metadata": {
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  },
  "execution_count": 1,
  "outputs": []
},
{
  "cell_type": "code",
  "source": [
    "print(s.split())"
  ],
  "metadata": {
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    "colab": {
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```

```
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    "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"
  ],
  "metadata": {
```

```
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  },
  "execution_count": 5,
  "outputs": []
},
{
  "cell_type": "code",
  "source": [
    "print(\"The diameter of {} is {} kilometers\".format(planet,diameter))"
  ],
  "metadata": {
    "id": "HyRyJv6CYPb4",
    "colab": {
      "base_uri": https://localhost:8080/
    },
    "outputId": "e4f4b3f1-7fa9-446e-e6a9-8a7d764a22e7"
  },
  "execution_count": 6,
  "outputs": [
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      "output_type": "stream",
      "name": "stdout",
      "text": [
        "The diameter of Earth is 12742 kilometers\n"
      ]
    }
  ]
},
{
```

```

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"source": [
  "## 3. In this nest dictionary grab the word \"hello\""
],
"metadata": {
  "id": "KE74ZEwkRExZ"
},
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  "cell_type": "code",
  "source": [
    "d = {'k1':[1,2,3,{'tricky':['oh','man','inception',{'target':[1,2,3,'hello']}]}]}"
  ],
  "metadata": {
    "id": "fcVwbCc1QrQl"
  },
  "execution_count": 7,
  "outputs": []
},
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  "cell_type": "code",
  "source": [
    "print(d['k1'][3]['tricky'][3]['target'][3])"
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  "metadata": {
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    "colab": {
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    }
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```

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  "execution_count": 8,
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      "name": "stdout",
      "text": [
        "hello\n"
      ]
    }
  ],
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    "source": [
      "# Numpy"
    ],
    "metadata": {
      "id": "bw0vVp-9ddjv"
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  {
    "cell_type": "code",
    "source": [
      "import numpy as np"
    ],
    "metadata": {
      "id": "LLiE_TYrhA1O"
```

```
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  "outputs": []
},
{
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  "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": [
    "np.zeros(10)"
  ],
  "metadata": {
    "id": "NHrirmgCYXvU",
    "colab": {
      "base_uri": https://localhost:8080/
    }
  },
  "outputId": "541c58b3-5ae1-4026-e93d-9ab293a335a9"
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  "outputs": [
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```

```
    "output_type": "execute_result",
    "data": {
      "text/plain": [
        "array([0., 0., 0., 0., 0., 0., 0., 0., 0., 0.])"
      ]
    },
    "metadata": {},
    "execution_count": 45
  }
]
},
{
  "cell_type": "code",
  "source": [
    "np.ones(10)*5"
  ],
  "metadata": {
    "id": "e4005lsTYXxx",
    "colab": {
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    }
  },
  "outputId": "70176ac7-4a33-40d7-876f-c28d98b9aa18"
},
  "execution_count": 46,
  "outputs": [
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      "output_type": "execute_result",
      "data": {
        "text/plain": [
```



```

        "array([5., 5., 5., 5., 5., 5., 5., 5., 5., 5.])"
    ]
},
"metadata": {},
"execution_count": 46
}
]
},
{
    "cell_type": "markdown",
    "source": [
        "## 5. Create an array of all the even integers from 20 to 35"
    ],
    "metadata": {
        "id": "gZHHdUBvrMX4"
    }
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{
    "cell_type": "code",
    "source": [
        "np.array([int(i) for i in range(20,35,2)])"
    ],
    "metadata": {
        "id": "oAI2tbU2Yag-",
        "colab": {
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        },
        "outputId": "2e755b91-cd23-4d3c-a468-c9d384b26bc2"
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```

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        "output_type": "execute_result",
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          "text/plain": [
            "array([20, 22, 24, 26, 28, 30, 32, 34])"
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        },
        "metadata": {},
        "execution_count": 44
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    "cell_type": "markdown",
    "source": [
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    "metadata": {
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    "cell_type": "code",
    "source": [
      "np.arange(0, 9).reshape(3,3)"
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          "array([[0, 1, 2],\n",
          "       [3, 4, 5],\n",
          "       [6, 7, 8]])"
        ]
      },
      "metadata": {},
      "execution_count": 51
    }
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    "source": [
      "## 7. Concatenate a and b \n",
      "## a = np.array([1, 2, 3]), b = np.array([4, 5, 6])"
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```
    "id": "hQ0dnhAQuU_p"
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  "source": [
    "np.concatenate((np.array([1,2,3]),np.array([4,5,6])))"
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      "data": {
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          "array([1, 2, 3, 4, 5, 6])"
        ]
      },
      "metadata": {},
      "execution_count": 43
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    "## 8. Create a dataframe with 3 rows and 2 columns"
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    "id": "ijoYW51zwr87"
  }
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  "cell_type": "code",
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    "import pandas as pd\n"
  ],
  "metadata": {
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  },
  "execution_count": 15,
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{
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  "source": [
    "pd.DataFrame({0:[1]*3,1:[1]*3})"
  ],
  "metadata": {
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    "colab": {
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      "height": 143
    },
    "outputId": "906e1a61-83a6-496f-8381-5d7de3474cf9"
  },
  "execution_count": 34,
  "outputs": [
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          "0 1 1\n",
          "1 1 1\n",
          "2 1 1"
        ],
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          "<div class=\"colab-df-container\">\n",
          "<div>\n",

```

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"  .dataframe tbody tr th:only-of-type {\n",
"    vertical-align: middle;\n",
"  }\n",
"\n",
"  .dataframe tbody tr th {\n",
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"  }\n",
"\n",
"  .dataframe thead th {\n",
"    text-align: right;\n",
"  }\n",
"</style>\n",
"<table border=\"1\" class=\"dataframe\">\n",
"  <thead>\n",
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"    </tr>\n",
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"      <th>1</th>\n",

```

```

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“    <td>1</td>\n”,
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“ </tbody>\n”,
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“</div>\n”,
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“    title=\`Convert this dataframe to an interactive table.\`\n”,
“    style=\`display:none;\`>\n”,
“  \n”,
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“    width=\`24px\`>\n”,
“    <path d=\`M0 0h24v24H0V0z\` fill=\`none\`/>\n”,
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“  </svg>\n”,
“  </button>\n”,
“  \n”,
“  <style>\n”,
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“      display:flex;\n”,

```



```
“ flex-wrap:wrap;\n”,
“ gap: 12px;\n”,
“ }\n”,
“\n”,
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“ 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”,
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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-9b29a928-12ed-4a1c-9523-f483e2a474dd 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-9b29a928-12ed-4a1c-9523-f483e2a474dd');\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
}
]
},
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    }
},
{
    "cell_type": "code",
    "source": [
        "pd.date_range(start=\"01/01/2023\",end=\"10/02/2023\")"
    ],
    "metadata": {
        "id": "dgyC0JhVYl4F",

```

```

"colab": {
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        "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')"

```

```

    "## 10. Create 2D list to DataFrame\n",
    "\n",
    "lists = [[1, 'aaa', 22],\n",
    "          [2, 'bbb', 25],\n",
    "          [3, 'ccc', 24]]"
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"metadata": {
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{
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    "source": [
        "lists = [[1, 'aaa', 22], [2, 'bbb', 25], [3, 'ccc', 24]]"
    ],
    "metadata": {
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    },
    "execution_count": 36,
    "outputs": []
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{
    "cell_type": "code",
    "source": [
        "pd.DataFrame(lists)"
    ],
    "metadata": {
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```

```

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"execution_count": 37,
"outputs": [
{
"output_type": "execute_result",
"data": {
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" 0  1  2\n",
"0 1 aaa 22\n",
"1 2 bbb 25\n",
"2 3 ccc 24"
],
"text/html": [
"\n",
" <div id=\"df-6c359152-0dd4-4058-bd46-87b89fa7776c\">\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>0</th>\n",
"     <th>1</th>\n",
"     <th>2</th>\n",
"   </tr>\n",
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"   <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>
```

```

“    <td>3</td>\n”,
“    <td>ccc</td>\n”,
“    <td>24</td>\n”,
“  </tr>\n”,
“ </tbody>\n”,
“</table>\n”,
“</div>\n”,
“    <button class=\“colab-df-convert\” onclick=\“convertToInteractive(df-6c359152-0dd4-4058-bd46-87b89fa7776c)\”>\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 11.8.5 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-.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”,
“ </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",
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"   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-6c359152-0dd4-4058-bd46-87b89fa7776c 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-6c359152-0dd4-4058-bd46-
87b89fa7776c');\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": 37  
}  
]  
}  
]  
}
```