MAHENDRA ENGINEERING COLLEGE FOR WOMEN

NAME : KALIYAMMAL T
CLASS : IV-CSE
SUB : IBM (Artificial intelligence)
REG NO : 611419104028


```
{
  "nbformat": 4,
  "nbformat_minor": 0,
  "metadata": {
    "colab": {
      "provenance": [],
      "collapsed_sections": []
    },
    "kernelspec": {
      "name": "python3",
      "display_name": "Python 3"
    },
    "language_info": {
      "name": "python"
    }
  },
  "cells": [
    {
      "cell_type": "markdown",
      "source": [
        "# Basic Python"
      ],
      "metadata": {
        "id": "McSxJAwcOdZ1"
      }
    },
    {
      "cell_type": "markdown",
      "source": [
        "## 1. Split this string"
      ],
      "metadata": {
        "id": "CU48hgo4Owz5"
      }
    },
    {
      "cell_type": "code",
      "source": [
        "s = \"Hi there Sam!\""
      ],
      "metadata": {
        "id": "s07c7JK7Oqt-"
      },
      "execution_count": 1,
      "outputs": []
    },
    {
      "cell_type": "code",
```

```
    "source": [
      "txt = \"Hi there Sam!\"\n",
      "\n",
      "x = txt.split()\n",
      "\n",
      "print(x)"
    ],
    "metadata": {
      "id": "6mGVa3SQYLkb",
      "colab": {
        "base_uri": "https://localhost:8080/"
      },
      "outputId": "826edc4f-3e69-41e8-bffc-c94dbbf01d67"
    },
    "execution_count": 2,
    "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"
    ],
    "metadata": {
      "id": "_ZHoml3kPqic"
    },
    "execution_count": 3,
    "outputs": []
  },
  {
    "cell_type": "code",
    "source": [
      "txt = \"The diameter of Earth {diameter:} is    kilometers\"\n",
      "print(txt.format(diameter = 12742))\n"
    ],
    "metadata": {
      "id": "HyRyJv6CYPb4",
      "colab": {
```

```
          "base_uri": "https://localhost:8080/"
        },
        "outputId": "f6753ae9-465e-4c1a-b2aa-584c5b085109"
      },
      "execution_count": 7,
      "outputs": [
        {
          "output_type": "stream",
          "name": "stdout",
          "text": [
            "The diameter of Earth 12742 is    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": "fcVwbCc1QrQI"
      },
      "execution_count": 8,
      "outputs": []
    },
    {
      "cell_type": "code",
      "source": [
        "print(d)"
      ],
      "metadata": {
        "id": "MvbkMZpXYRaw",
        "colab": {
          "base_uri": "https://localhost:8080/"
        },
        "outputId": "e6d7ee94-2ffb-4bd8-a5a7-005f5b117e7e"
      },
      "execution_count": 15,
      "outputs": [
        {
          "output_type": "stream",
          "name": "stdout",
          "text": [
            "{'k1': [1, 2, 3, {'tricky': ['oh', 'man', 'inception', {'target': [1, 2, 3, '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": 18,
   "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": [
      "array=np.zeros(10)\n",
      "print(\"An array of 10 zeros:\")"
   ],
   "metadata": {
      "id": "NHrirmgCYXvU",
      "colab": {
         "base_uri": "https://localhost:8080/"
      },
      "outputId": "82730e66-fb70-48b6-90d8-85a831736b5a"
   },
   "execution_count": 19,
   "outputs": [
      {
         "output_type": "stream",
         "name": "stdout",
         "text": [
            "An array of 10 zeros:\n"
         ]
      }
   ]
},
{
   "cell_type": "code",
```

```
    "source": [
      "array=np.zeros(10)\n",
      "print(\"An array of 5 fives:\")"
    ],
    "metadata": {
      "id": "e4005lsTYXxx",
      "colab": {
        "base_uri": "https://localhost:8080/"
      },
      "outputId": "3bf02af0-7bd0-4299-8d16-68347a566a1e"
    },
    "execution_count": 20,
    "outputs": [
      {
        "output_type": "stream",
        "name": "stdout",
        "text": [
          "An array of 5 fives:\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": [
      "array=np.arange(20,35,2)\n",
      "print(\"Array of all the even integers from 20 to 35\")\n",
      "print(array)"
    ],
    "metadata": {
      "id": "oAI2tbU2Yag-",
      "colab": {
        "base_uri": "https://localhost:8080/"
      },
      "outputId": "28ef5cb3-93cb-4ff8-a886-fbffc66193c3"
    },
    "execution_count": 21,
    "outputs": [
      {
        "output_type": "stream",
        "name": "stdout",
        "text": [
          "Array of all the even integers from 20 to 35\n",
          "[20 22 24 26 28 30 32 34]\n"
        ]
      }
    ]
  },
```

```
{
   "cell_type": "markdown",
   "source": [
      "## 6. Create a 3x3 matrix with values ranging from 0 to 8"
   ],
   "metadata": {
      "id": "NaOM308NsRpZ"
   }
},
{
   "cell_type": "code",
   "source": [
      "x =    np.arange(0, 9).reshape(3,3)\n",
      "print(x)"
   ],
   "metadata": {
      "id": "tOlEVH7BYceE",
      "colab": {
         "base_uri": "https://localhost:8080/"
      },
      "outputId": "80cd8b42-95ea-4b83-ad7a-9453f0613c69"
   },
   "execution_count": 22,
   "outputs": [
      {
         "output_type": "stream",
         "name": "stdout",
         "text": [
            "[[0 1 2]\n",
            " [3 4 5]\n",
            " [6 7 8]]\n"
         ]
      }
   ]
},
{
   "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 = [1, 2,3]\n",
      "b = [4,5,6]\n",
      "    \n",
      "\n",
      "for i in b :\n",
      "       a.append(i)\n",
      "    \n",
      "\n",
      "print (\"Concatenated list a and b is : \" \n",
```

```
        "                                                + str(a))"
      ],
      "metadata": {
        "id": "rAPSw97aYfE0",
        "colab": {
          "base_uri": "https://localhost:8080/"
        },
        "outputId": "445a4c3e-58ac-4a80-852e-67e724926cad"
      },
      "execution_count": 24,
      "outputs": [
        {
          "output_type": "stream",
          "name": "stdout",
          "text": [
            "Concatenated list a and b is : [1, 2, 3, 4, 5, 6]\n"
          ]
        }
      ]
    },
    {
      "cell_type": "markdown",
      "source": [
        "# Pandas"
      ],
      "metadata": {
        "id": "dlPEY9DRwZga"
      }
    },
    {
      "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": 25,
      "outputs": []
    },
    {
      "cell_type": "code",
      "source": [
        "\n",
        "    \n",
        "\n",
        "data = [['tom', 10], ['nick', 15], ['juli', 14]]\n",
        "    \n",
```

```
    "\n",
    "df = pd.DataFrame(data, columns=['Name', 'Age'])\n",
    "\n",
    "df"
  ],
  "metadata": {
    "id": "xNpI_XXoYhs0",
    "colab": {
      "base_uri": "https://localhost:8080/",
      "height": 143
    },
    "outputId": "2402a0ee-40d1-4e6a-dcd5-5cdea1985c78"
  },
  "execution_count": 26,
  "outputs": [
    {
      "output_type": "execute_result",
      "data": {
        "text/plain": [
          "    Name   Age\n",
          "0    tom    10\n",
          "1   nick    15\n",
          "2   juli    14"
        ],
        "text/html": [
          "\n",
          "  <div id=\"df-a344f79d-1761-4ba3-b335-c8666e11be17\">\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>Name</th>\n",
          "      <th>Age</th>\n",
          "    </tr>\n",
          "  </thead>\n",
          "  <tbody>\n",
          "    <tr>\n",
          "      <th>0</th>\n",
          "      <td>tom</td>\n",
          "      <td>10</td>\n",
          "    </tr>\n",
          "    <tr>\n",
```

```
                "      <th>1</th>\n",
                "      <td>nick</td>\n",
                "      <td>15</td>\n",
                "    </tr>\n",
                "    <tr>\n",
                "      <th>2</th>\n",
                "      <td>juli</td>\n",
                "      <td>14</td>\n",
                "    </tr>\n",
                "  </tbody>\n",
                "</table>\n",
                "</div>\n",
                "      <button class=\"colab-df-convert\" onclick=\"convertToInteractive('df-
a344f79d-1761-4ba3-b335-c8666e11be17')\"\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 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-.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-a344f79d-1761-4ba3-b335-
c8666e11be17 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-a344f79d-1761-
4ba3-b335-c8666e11be17');\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": 26
        }
    ]
},
{
    "cell_type": "markdown",
    "source": [
        "*italicized text*## 9. Generate the series of dates from 1st Jan, 2023 to 10th Feb,
2023"
    ],
```

```
    "metadata": {
      "id": "UXSmdNclyJQD"
    }
  },
  {
    "cell_type": "code",
    "source": [
      "import pandas as pd\n",
      "\n",
      "\n",
      "dates = pd.date_range('2023-01-01', periods=41, freq='D')\n",
      "\n",
      "s = pd.Series(dates)\n",
      "print (s)"
    ],
    "metadata": {
      "id": "dgyC0JhVYl4F",
      "colab": {
        "base_uri": "https://localhost:8080/"
      },
      "outputId": "f9c818dd-bcf2-480d-ab74-9fc46403210b"
    },
    "execution_count": 29,
    "outputs": [
      {
        "output_type": "stream",
        "name": "stdout",
        "text": [
          "0   2023-01-01\n",
          "1   2023-01-02\n",
          "2   2023-01-03\n",
          "3   2023-01-04\n",
          "4   2023-01-05\n",
          "5   2023-01-06\n",
          "6   2023-01-07\n",
          "7   2023-01-08\n",
          "8   2023-01-09\n",
          "9   2023-01-10\n",
          "10  2023-01-11\n",
          "11  2023-01-12\n",
          "12  2023-01-13\n",
          "13  2023-01-14\n",
          "14  2023-01-15\n",
          "15  2023-01-16\n",
          "16  2023-01-17\n",
          "17  2023-01-18\n",
          "18  2023-01-19\n",
          "19  2023-01-20\n",
          "20  2023-01-21\n",
          "21  2023-01-22\n",
          "22  2023-01-23\n",
          "23  2023-01-24\n",
          "24  2023-01-25\n",
          "25  2023-01-26\n",
          "26  2023-01-27\n",
          "27  2023-01-28\n",
          "28  2023-01-29\n",
```

```
            "29     2023-01-30\n",
            "30     2023-01-31\n",
            "31     2023-02-01\n",
            "32     2023-02-02\n",
            "33     2023-02-03\n",
            "34     2023-02-04\n",
            "35     2023-02-05\n",
            "36     2023-02-06\n",
            "37     2023-02-07\n",
            "38     2023-02-08\n",
            "39     2023-02-09\n",
            "40     2023-02-10\n",
            "dtype: datetime64[ns]\n"
          ]
        }
      ]
    },
    {
      "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": "_XMC8aEt0llB"
      },
      "execution_count": 33,
      "outputs": []
    },
    {
      "cell_type": "code",
      "source": [
        "import pandas as pd    \n",
        "          \n",
        " \n",
        "lst = [[1, 'aaa', 22], [2, 'bbb', 25], [3, 'ccc', 24]]\n",
        "              \n",
        "    \n",
        " \n",
        "df = pd.DataFrame(lst, columns =['NO', 'name','age']) \n",
        "print(df)"
      ],
      "metadata": {
        "id": "knH76sDKYsVX",
        "colab": {
```

```
            "base_uri": "https://localhost:8080/"
          },
          "outputId": "19affc1b-734e-4740-cb8a-40d4f6d423a5"
        },
        "execution_count": 37,
        "outputs": [
          {
            "output_type": "stream",
            "name": "stdout",
            "text": [
              "     NO name    age\n",
              "0     1    aaa     22\n",
              "1     2    bbb     25\n",
              "2     3    ccc     24\n"
            ]
          }
        ]
      }
    ]
}
```