```
{
 "cells": [
  {
   "cell_type": "markdown",
   "metadata": {},
   "source": [
    "<h3>Import libraries to use for this project</h3>\n"
   ]
  },
  {
   "cell_type": "code",
   "execution_count": 8,
   "metadata": {},
   "outputs": [],
   "source": [
    "import pandas as pd\n",
    "import sqlite3\n",
    "import numpy as np\n",
    "import os\n",
    "from pandasql import sqldf\n",
    "import matplotlib.pyplot as plt\n",
    "import seaborn as sns"
   ]
  },
  {
   "cell_type": "markdown",
   "metadata": {},
   "source": [
    "<h2>Data Understanding and Exploration</h2>\n",
    "1. IMDB database  "
   ]
  },
  {
   "cell_type": "code",
   "execution_count": 9,
   "metadata": {},
   "outputs": [],
   "source": [
    "#connect to the SQL database\n",
    "# Define the path to the database file\n",
    "\n",
    "db_path = \"data\\\\im.db\\\\im.db\"\n",
    "conn = sqlite3.connect(db_path)\n",
    "\n"
   ]
  },
  {
   "cell_type": "code",
   "execution_count": 10,
   "metadata": {},
   "outputs": [
    {
     "data": {
      "text/html": [
       "<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",
        "    </tr>\n",
        "  </thead>\n",
        "  <tbody>\n",
        "    <tr>\n",
        "      <th>0</th>\n",
        "      <td>movie_basics</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>1</th>\n",
        "      <td>directors</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>2</th>\n",
        "      <td>known_for</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>3</th>\n",
        "      <td>movie_akas</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>4</th>\n",
        "      <td>movie_ratings</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>5</th>\n",
        "      <td>persons</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>6</th>\n",
        "      <td>principals</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>7</th>\n",
        "      <td>writers</td>\n",
        "    </tr>\n",
        "  </tbody>\n",
        "</table>\n",
        "</div>"
       ],
       "text/plain": [
        "            name\n",
        "0   movie_basics\n",
        "1      directors\n",
        "2      known_for\n",
        "3     movie_akas\n",
        "4  movie_ratings\n",
        "5        persons\n",
        "6     principals\n",
        "7        writers"
       ]
      },
      "execution_count": 10,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "#view list of tables\n",
     "query =  \"SELECT name FROM sqlite_master WHERE type='table';\"\n",
     "imdb_df = pd.read_sql(query, conn)\n",
     "imdb_df\n"
    ]
   },
   {
    "cell_type": "code",
```

```
"execution_count": 11,
"metadata": {},
"outputs": [
 {
  "data": {
   "text/html": [
    "<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>movie_id</th>\n",
    "      <th>primary_title</th>\n",
    "      <th>original_title</th>\n",
    "      <th>start_year</th>\n",
    "      <th>runtime_minutes</th>\n",
    "      <th>genres</th>\n",
    "    </tr>\n",
    "  </thead>\n",
    "  <tbody>\n",
    "    <tr>\n",
    "      <th>0</th>\n",
    "      <td>tt0063540</td>\n",
    "      <td>Sunghursh</td>\n",
    "      <td>Sunghursh</td>\n",
    "      <td>2013</td>\n",
    "      <td>175.0</td>\n",
    "      <td>Action,Crime,Drama</td>\n",
    "    </tr>\n",
    "    <tr>\n",
    "      <th>1</th>\n",
    "      <td>tt0066787</td>\n",
    "      <td>One Day Before the Rainy Season</td>\n",
    "      <td>Ashad Ka Ek Din</td>\n",
    "      <td>2019</td>\n",
    "      <td>114.0</td>\n",
    "      <td>Biography,Drama</td>\n",
    "    </tr>\n",
    "    <tr>\n",
    "      <th>2</th>\n",
    "      <td>tt0069049</td>\n",
    "      <td>The Other Side of the Wind</td>\n",
    "      <td>The Other Side of the Wind</td>\n",
    "      <td>2018</td>\n",
    "      <td>122.0</td>\n",
    "      <td>Drama</td>\n",
    "    </tr>\n",
    "    <tr>\n",
    "      <th>3</th>\n",
    "      <td>tt0069204</td>\n",
    "      <td>Sabse Bada Sukh</td>\n",
    "      <td>Sabse Bada Sukh</td>\n",
    "      <td>2018</td>\n",
    "      <td>NaN</td>\n",
    "      <td>Comedy,Drama</td>\n",
    "    </tr>\n",
```

```
"    <tr>\n",
"      <th>4</th>\n",
"      <td>tt0100275</td>\n",
"      <td>The Wandering Soap Opera</td>\n",
"      <td>La Telenovela Errante</td>\n",
"      <td>2017</td>\n",
"      <td>80.0</td>\n",
"      <td>Comedy,Drama,Fantasy</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>...</th>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>146139</th>\n",
"      <td>tt9916538</td>\n",
"      <td>Kuambil Lagi Hatiku</td>\n",
"      <td>Kuambil Lagi Hatiku</td>\n",
"      <td>2019</td>\n",
"      <td>123.0</td>\n",
"      <td>Drama</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>146140</th>\n",
"      <td>tt9916622</td>\n",
"      <td>Rodolpho Teóphilo - O Legado de um Pioneiro</td>\n",
"      <td>Rodolpho Teóphilo - O Legado de um Pioneiro</td>\n",
"      <td>2015</td>\n",
"      <td>NaN</td>\n",
"      <td>Documentary</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>146141</th>\n",
"      <td>tt9916706</td>\n",
"      <td>Dankyavar Danka</td>\n",
"      <td>Dankyavar Danka</td>\n",
"      <td>2013</td>\n",
"      <td>NaN</td>\n",
"      <td>Comedy</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>146142</th>\n",
"      <td>tt9916730</td>\n",
"      <td>6 Gunn</td>\n",
"      <td>6 Gunn</td>\n",
"      <td>2017</td>\n",
"      <td>116.0</td>\n",
"      <td>None</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>146143</th>\n",
"      <td>tt9916754</td>\n",
"      <td>Chico Albuquerque - Revelações</td>\n",
"      <td>Chico Albuquerque - Revelações</td>\n",
"      <td>2013</td>\n",
"      <td>NaN</td>\n",
"      <td>Documentary</td>\n",
"    </tr>\n",
"  </tbody>\n",
"</table>\n",
"<p>146144 rows × 6 columns</p>\n",
"</div>"
],
"text/plain": [
```

```
        "         movie_id                                primary_title  \\\n",
        "0       tt0063540                                    Sunghursh   \n",
        "1       tt0066787             One Day Before the Rainy Season   \n",
        "2       tt0069049                  The Other Side of the Wind   \n",
        "3       tt0069204                                Sabse Bada Sukh   \n",
        "4       tt0100275                  The Wandering Soap Opera   \n",
        "...           ...                                         ...   \n",
        "146139  tt9916538                           Kuambil Lagi Hatiku   \n",
        "146140  tt9916622  Rodolpho Teóphilo - O Legado de um Pioneiro   \n",
        "146141  tt9916706                               Dankyavar Danka   \n",
        "146142  tt9916730                                      6 Gunn   \n",
        "146143  tt9916754              Chico Albuquerque - Revelações   \n",
        "\n",
        "                                  original_title  start_year  \\\n",
        "0                                      Sunghursh        2013   \n",
        "1                                  Ashad Ka Ek Din        2019   \n",
        "2                        The Other Side of the Wind        2018   \n",
        "3                                  Sabse Bada Sukh        2018   \n",
        "4                             La Telenovela Errante        2017   \n",
        "...                                             ...         ...   \n",
        "146139                          Kuambil Lagi Hatiku        2019   \n",
        "146140  Rodolpho Teóphilo - O Legado de um Pioneiro        2015   \n",
        "146141                               Dankyavar Danka        2013   \n",
        "146142                                       6 Gunn        2017   \n",
        "146143               Chico Albuquerque - Revelações        2013   \n",
        "\n",
        "        runtime_minutes                genres  \n",
        "0                 175.0    Action,Crime,Drama  \n",
        "1                 114.0       Biography,Drama  \n",
        "2                 122.0                 Drama  \n",
        "3                   NaN          Comedy,Drama  \n",
        "4                  80.0  Comedy,Drama,Fantasy  \n",
        "...                 ...                   ...  \n",
        "146139            123.0                 Drama  \n",
        "146140              NaN           Documentary  \n",
        "146141              NaN                Comedy  \n",
        "146142            116.0                  None  \n",
        "146143              NaN           Documentary  \n",
        "\n",
        "[146144 rows x 6 columns]"
       ]
      },
      "execution_count": 11,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "#view details of the first table - movie basics\n",
     "movie_basics_query = \"SELECT * FROM movie_basics\"\n",
     "movie_basics_df = pd.read_sql(movie_basics_query, conn)\n",
     "movie_basics_df\n"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 12,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "text/plain": [
        "<bound method DataFrame.info of          movie_id                                primary_title  \\\n",
        "0       tt0063540                                    Sunghursh   \n",
        "1       tt0066787             One Day Before the Rainy Season   \n",
        "2       tt0069049                  The Other Side of the Wind   \n",
        "3       tt0069204                                Sabse Bada Sukh   \n",
        "4       tt0100275                  The Wandering Soap Opera   \n",
```

```
        "...          ...                                          ...   \n",
        "146139  tt9916538                        Kuambil Lagi Hatiku   \n",
        "146140  tt9916622  Rodolpho Teóphilo - O Legado de um Pioneiro   \n",
        "146141  tt9916706                              Dankyavar Danka   \n",
        "146142  tt9916730                                      6 Gunn   \n",
        "146143  tt9916754              Chico Albuquerque - Revelações   \n",
        "\n",
        "                                    original_title  start_year  \\\n",
        "0                                        Sunghursh        2013   \n",
        "1                                   Ashad Ka Ek Din        2019   \n",
        "2                        The Other Side of the Wind        2018   \n",
        "3                                   Sabse Bada Sukh        2018   \n",
        "4                             La Telenovela Errante        2017   \n",
        "...                                             ...         ...   \n",
        "146139                          Kuambil Lagi Hatiku        2019   \n",
        "146140  Rodolpho Teóphilo - O Legado de um Pioneiro        2015   \n",
        "146141                               Dankyavar Danka        2013   \n",
        "146142                                       6 Gunn        2017   \n",
        "146143               Chico Albuquerque - Revelações        2013   \n",
        "\n",
        "        runtime_minutes                genres  \n",
        "0                 175.0    Action,Crime,Drama  \n",
        "1                 114.0       Biography,Drama  \n",
        "2                 122.0                 Drama  \n",
        "3                   NaN          Comedy,Drama  \n",
        "4                  80.0  Comedy,Drama,Fantasy  \n",
        "...                 ...                   ...  \n",
        "146139            123.0                 Drama  \n",
        "146140              NaN           Documentary  \n",
        "146141              NaN                Comedy  \n",
        "146142            116.0                  None  \n",
        "146143              NaN           Documentary  \n",
        "\n",
        "[146144 rows x 6 columns]>"
       ]
      },
      "execution_count": 12,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "movie_basics_df.columns\n",
     "#use the .info method to have a general idea about the dataframe - the columns, their
values\n",
     "\n",
     "movie_basics_df.info"
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "movie basic table has 6 column :
movie_id\tprimary_title\toriginal_title\tstart_year\truntime_minutes\tgenres"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 13,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "text/html": [
        "<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>movie_id</th>\n",
"      <th>averagerating</th>\n",
"      <th>numvotes</th>\n",
"    </tr>\n",
"  </thead>\n",
"  <tbody>\n",
"    <tr>\n",
"      <th>0</th>\n",
"      <td>tt10356526</td>\n",
"      <td>8.3</td>\n",
"      <td>31</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>1</th>\n",
"      <td>tt10384606</td>\n",
"      <td>8.9</td>\n",
"      <td>559</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>2</th>\n",
"      <td>tt1042974</td>\n",
"      <td>6.4</td>\n",
"      <td>20</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>3</th>\n",
"      <td>tt1043726</td>\n",
"      <td>4.2</td>\n",
"      <td>50352</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>4</th>\n",
"      <td>tt1060240</td>\n",
"      <td>6.5</td>\n",
"      <td>21</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>...</th>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>73851</th>\n",
"      <td>tt9805820</td>\n",
"      <td>8.1</td>\n",
"      <td>25</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>73852</th>\n",
"      <td>tt9844256</td>\n",
"      <td>7.5</td>\n",
"      <td>24</td>\n",
"    </tr>\n",
"    <tr>\n",
```

```
        "      <th>73853</th>\n",
        "      <td>tt9851050</td>\n",
        "      <td>4.7</td>\n",
        "      <td>14</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>73854</th>\n",
        "      <td>tt9886934</td>\n",
        "      <td>7.0</td>\n",
        "      <td>5</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>73855</th>\n",
        "      <td>tt9894098</td>\n",
        "      <td>6.3</td>\n",
        "      <td>128</td>\n",
        "    </tr>\n",
        "  </tbody>\n",
        "</table>\n",
        "<p>73856 rows × 3 columns</p>\n",
        "</div>"
       ],
       "text/plain": [
        "         movie_id  averagerating  numvotes\n",
        "0      tt10356526            8.3        31\n",
        "1      tt10384606            8.9       559\n",
        "2       tt1042974            6.4        20\n",
        "3       tt1043726            4.2     50352\n",
        "4       tt1060240            6.5        21\n",
        "...           ...            ...       ...\n",
        "73851   tt9805820            8.1        25\n",
        "73852   tt9844256            7.5        24\n",
        "73853   tt9851050            4.7        14\n",
        "73854   tt9886934            7.0         5\n",
        "73855   tt9894098            6.3       128\n",
        "\n",
        "[73856 rows x 3 columns]"
       ]
      },
      "execution_count": 13,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "#read the contents of the second table to use for this project - movie ratings\n",
     "movie_ratings_query = \"SELECT * FROM movie_ratings\"\n",
     "movie_ratings_df = pd.read_sql(movie_ratings_query, conn)\n",
     "movie_ratings_df"
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "Movie ratings has three columns - movie_id, averagerating, numvotes"
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "# DATA CLEANING\n"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 14,
    "metadata": {},
```

```
   "outputs": [
    {
     "data": {
      "text/plain": [
       "movie_id               0\n",
       "primary_title          0\n",
       "original_title        21\n",
       "start_year             0\n",
       "runtime_minutes    31739\n",
       "genres              5408\n",
       "dtype: int64"
      ]
     },
     "execution_count": 14,
     "metadata": {},
     "output_type": "execute_result"
    }
   ],
   "source": [
    "#check to establish if the movie_basic df has any missing values \n",
    "movie_basics_df.isna().sum()"
   ]
  },
  {
   "cell_type": "code",
   "execution_count": 15,
   "metadata": {},
   "outputs": [
    {
     "data": {
      "text/plain": [
       "movie_id            0.000000\n",
       "primary_title       0.000000\n",
       "original_title      0.014369\n",
       "start_year          0.000000\n",
       "runtime_minutes    21.717621\n",
       "genres              3.700460\n",
       "dtype: float64"
      ]
     },
     "execution_count": 15,
     "metadata": {},
     "output_type": "execute_result"
    }
   ],
   "source": [
    "#check for missing values in the movies_basics dataframe in percentage\n",
    "missing_percentage = movie_basics_df.isna().mean() * 100\n",
    "missing_percentage\n"
   ]
  },
  {
   "cell_type": "code",
   "execution_count": 16,
   "metadata": {},
   "outputs": [
    {
     "data": {
      "text/html": [
       "<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>movie_id</th>\n",
"      <th>primary_title</th>\n",
"      <th>original_title</th>\n",
"      <th>start_year</th>\n",
"      <th>runtime_minutes</th>\n",
"      <th>genres</th>\n",
"    </tr>\n",
"  </thead>\n",
"  <tbody>\n",
"    <tr>\n",
"      <th>0</th>\n",
"      <td>tt0069204</td>\n",
"      <td>Sabse Bada Sukh</td>\n",
"      <td>Sabse Bada Sukh</td>\n",
"      <td>2018</td>\n",
"      <td>None</td>\n",
"      <td>Comedy,Drama</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>1</th>\n",
"      <td>tt0112502</td>\n",
"      <td>Bigfoot</td>\n",
"      <td>Bigfoot</td>\n",
"      <td>2017</td>\n",
"      <td>None</td>\n",
"      <td>Horror,Thriller</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>2</th>\n",
"      <td>tt0139613</td>\n",
"      <td>O Silêncio</td>\n",
"      <td>O Silêncio</td>\n",
"      <td>2012</td>\n",
"      <td>None</td>\n",
"      <td>Documentary,History</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>3</th>\n",
"      <td>tt0187902</td>\n",
"      <td>How Huang Fei-hong Rescued the Orphan from the...</td>\n",
"      <td>How Huang Fei-hong Rescued the Orphan from the...</td>\n",
"      <td>2011</td>\n",
"      <td>None</td>\n",
"      <td>None</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>4</th>\n",
"      <td>tt0250404</td>\n",
"      <td>Godfather</td>\n",
"      <td>Godfather</td>\n",
"      <td>2012</td>\n",
"      <td>None</td>\n",
"      <td>Crime,Drama</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>...</th>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
```

```
"      <td>...</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>31734</th>\n",
"      <td>tt9915790</td>\n",
"      <td>Bobbyr Bondhura</td>\n",
"      <td>Bobbyr Bondhura</td>\n",
"      <td>2019</td>\n",
"      <td>None</td>\n",
"      <td>Family</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>31735</th>\n",
"      <td>tt9916428</td>\n",
"      <td>The Secret of China</td>\n",
"      <td>The Secret of China</td>\n",
"      <td>2019</td>\n",
"      <td>None</td>\n",
"      <td>Adventure,History,War</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>31736</th>\n",
"      <td>tt9916622</td>\n",
"      <td>Rodolpho Teóphilo - O Legado de um Pioneiro</td>\n",
"      <td>Rodolpho Teóphilo - O Legado de um Pioneiro</td>\n",
"      <td>2015</td>\n",
"      <td>None</td>\n",
"      <td>Documentary</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>31737</th>\n",
"      <td>tt9916706</td>\n",
"      <td>Dankyavar Danka</td>\n",
"      <td>Dankyavar Danka</td>\n",
"      <td>2013</td>\n",
"      <td>None</td>\n",
"      <td>Comedy</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>31738</th>\n",
"      <td>tt9916754</td>\n",
"      <td>Chico Albuquerque - Revelações</td>\n",
"      <td>Chico Albuquerque - Revelações</td>\n",
"      <td>2013</td>\n",
"      <td>None</td>\n",
"      <td>Documentary</td>\n",
"    </tr>\n",
"  </tbody>\n",
"</table>\n",
"<p>31739 rows × 6 columns</p>\n",
"</div>"
],
"text/plain": [
"        movie_id                                      primary_title  \\\n",
"0      tt0069204                                   Sabse Bada Sukh   \n",
"1      tt0112502                                           Bigfoot   \n",
"2      tt0139613                                        O Silêncio   \n",
"3      tt0187902  How Huang Fei-hong Rescued the Orphan from the...   \n",
"4      tt0250404                                         Godfather   \n",
"...          ...                                               ...   \n",
"31734  tt9915790                                   Bobbyr Bondhura   \n",
"31735  tt9916428                                The Secret of China   \n",
"31736  tt9916622       Rodolpho Teóphilo - O Legado de um Pioneiro   \n",
"31737  tt9916706                                   Dankyavar Danka   \n",
"31738  tt9916754                    Chico Albuquerque - Revelações   \n",
"\n",
"                                    original_title  start_year  \\\n",
"0                                   Sabse Bada Sukh        2018   \n",
"1                                           Bigfoot        2017   \n",
```

```
        "2                                          O Silêncio        2012   \n",
        "3      How Huang Fei-hong Rescued the Orphan from the...        2011   \n",
        "4                                           Godfather        2012   \n",
        "...                                               ...         ...   \n",
        "31734                              Bobbyr Bondhura        2019   \n",
        "31735                           The Secret of China        2019   \n",
        "31736        Rodolpho Teóphilo - O Legado de um Pioneiro        2015   \n",
        "31737                              Dankyavar Danka        2013   \n",
        "31738                Chico Albuquerque - Revelações        2013   \n",
        "\n",
        "      runtime_minutes                genres  \n",
        "0                None           Comedy,Drama  \n",
        "1                None        Horror,Thriller  \n",
        "2                None    Documentary,History  \n",
        "3                None                  None  \n",
        "4                None            Crime,Drama  \n",
        "...               ...                   ...  \n",
        "31734            None                Family  \n",
        "31735            None  Adventure,History,War  \n",
        "31736            None           Documentary  \n",
        "31737            None                Comedy  \n",
        "31738            None           Documentary  \n",
        "\n",
        "[31739 rows x 6 columns]"
       ]
      },
      "execution_count": 16,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "#VISUALLY CHECK FOR NULL VALUES IN THE FIRST TABLE\n",
     "query = \"\"\"SELECT * \n",
     "              FROM movie_basics \n",
     "              WHERE runtime_minutes IS NULL;\"\"\"\n",
     "movie_basics_null = pd.read_sql(query, conn)\n",
     "movie_basics_null\n"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 17,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "text/plain": [
        "31739"
       ]
      },
      "execution_count": 17,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "len(movie_basics_null)"
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "There are 31,739 rows that have no input/data for the runtime minutes for the movies. \n",
     "The number of rows in the table are 146,144, that makes for almost 22% of the total data with missing values. Because the data is more than 20%, it is crucial to explore imputation techniques to fill in the gaps. The imputation technique used for this set is the median incase there are outliers in the column. \n",
```

```
     "\n"
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "The genres column has a 3% output which indicates that only 3% of rows in that column have
 missing data. Because the missing data in this column is less than 5 %, it is considered safe to
 drop this rows without it significantly impacting the analysis\n"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 18,
    "metadata": {},
    "outputs": [
     {
      "name": "stdout",
      "output_type": "stream",
      "text": [
       "original_title      0.014369\n",
       "runtime_minutes    21.717621\n",
       "genres              3.700460\n",
       "dtype: float64\n"
      ]
     }
    ],
    "source": [
     "print(missing_percentage[missing_percentage > 0])"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 19,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "text/html": [
        "<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>movie_id</th>\n",
        "      <th>primary_title</th>\n",
        "      <th>original_title</th>\n",
        "      <th>start_year</th>\n",
        "      <th>runtime_minutes</th>\n",
        "      <th>genres</th>\n",
        "    </tr>\n",
        "  </thead>\n",
        "  <tbody>\n",
        "    <tr>\n",
        "      <th>0</th>\n",
```

```
"      <td>tt0063540</td>\n",
"      <td>Sunghursh</td>\n",
"      <td>Sunghursh</td>\n",
"      <td>2013</td>\n",
"      <td>175.0</td>\n",
"      <td>Action,Crime,Drama</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>1</th>\n",
"      <td>tt0066787</td>\n",
"      <td>One Day Before the Rainy Season</td>\n",
"      <td>Ashad Ka Ek Din</td>\n",
"      <td>2019</td>\n",
"      <td>114.0</td>\n",
"      <td>Biography,Drama</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>2</th>\n",
"      <td>tt0069049</td>\n",
"      <td>The Other Side of the Wind</td>\n",
"      <td>The Other Side of the Wind</td>\n",
"      <td>2018</td>\n",
"      <td>122.0</td>\n",
"      <td>Drama</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>3</th>\n",
"      <td>tt0069204</td>\n",
"      <td>Sabse Bada Sukh</td>\n",
"      <td>Sabse Bada Sukh</td>\n",
"      <td>2018</td>\n",
"      <td>87.0</td>\n",
"      <td>Comedy,Drama</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>4</th>\n",
"      <td>tt0100275</td>\n",
"      <td>The Wandering Soap Opera</td>\n",
"      <td>La Telenovela Errante</td>\n",
"      <td>2017</td>\n",
"      <td>80.0</td>\n",
"      <td>Comedy,Drama,Fantasy</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>...</th>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>146139</th>\n",
"      <td>tt9916538</td>\n",
"      <td>Kuambil Lagi Hatiku</td>\n",
"      <td>Kuambil Lagi Hatiku</td>\n",
"      <td>2019</td>\n",
"      <td>123.0</td>\n",
"      <td>Drama</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>146140</th>\n",
"      <td>tt9916622</td>\n",
"      <td>Rodolpho Teóphilo - O Legado de um Pioneiro</td>\n",
"      <td>Rodolpho Teóphilo - O Legado de um Pioneiro</td>\n",
"      <td>2015</td>\n",
"      <td>87.0</td>\n",
"      <td>Documentary</td>\n",
```

```
"    </tr>\n",
"    <tr>\n",
"      <th>146141</th>\n",
"      <td>tt9916706</td>\n",
"      <td>Dankyavar Danka</td>\n",
"      <td>Dankyavar Danka</td>\n",
"      <td>2013</td>\n",
"      <td>87.0</td>\n",
"      <td>Comedy</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>146142</th>\n",
"      <td>tt9916730</td>\n",
"      <td>6 Gunn</td>\n",
"      <td>6 Gunn</td>\n",
"      <td>2017</td>\n",
"      <td>116.0</td>\n",
"      <td>None</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>146143</th>\n",
"      <td>tt9916754</td>\n",
"      <td>Chico Albuquerque - Revelações</td>\n",
"      <td>Chico Albuquerque - Revelações</td>\n",
"      <td>2013</td>\n",
"      <td>87.0</td>\n",
"      <td>Documentary</td>\n",
"    </tr>\n",
"  </tbody>\n",
"</table>\n",
"<p>146144 rows × 6 columns</p>\n",
"</div>"
],
"text/plain": [
"         movie_id                                primary_title  \\\n",
"0       tt0063540                                    Sunghursh   \n",
"1       tt0066787           One Day Before the Rainy Season   \n",
"2       tt0069049                The Other Side of the Wind   \n",
"3       tt0069204                                  Sabse Bada Sukh   \n",
"4       tt0100275                  The Wandering Soap Opera   \n",
"...           ...                                       ...   \n",
"146139  tt9916538                           Kuambil Lagi Hatiku   \n",
"146140  tt9916622  Rodolpho Teóphilo - O Legado de um Pioneiro   \n",
"146141  tt9916706                               Dankyavar Danka   \n",
"146142  tt9916730                                    6 Gunn   \n",
"146143  tt9916754             Chico Albuquerque - Revelações   \n",
"\n",
"                                  original_title  start_year  \\\n",
"0                                      Sunghursh        2013   \n",
"1                                Ashad Ka Ek Din        2019   \n",
"2                     The Other Side of the Wind        2018   \n",
"3                                Sabse Bada Sukh        2018   \n",
"4                           La Telenovela Errante        2017   \n",
"...                                           ...         ...   \n",
"146139                        Kuambil Lagi Hatiku        2019   \n",
"146140  Rodolpho Teóphilo - O Legado de um Pioneiro        2015   \n",
"146141                           Dankyavar Danka        2013   \n",
"146142                                    6 Gunn        2017   \n",
"146143            Chico Albuquerque - Revelações        2013   \n",
"\n",
"        runtime_minutes                genres  \n",
"0                 175.0    Action,Crime,Drama  \n",
"1                 114.0       Biography,Drama  \n",
"2                 122.0                 Drama  \n",
"3                  87.0          Comedy,Drama  \n",
"4                  80.0  Comedy,Drama,Fantasy  \n",
"...                 ...                   ...  \n",
"146139            123.0                 Drama  \n",
"146140             87.0           Documentary  \n",
```

```
        "146141             87.0                Comedy  \n",
        "146142            116.0                  None  \n",
        "146143             87.0           Documentary  \n",
        "\n",
        "[146144 rows x 6 columns]"
       ]
      },
      "execution_count": 19,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "##Fill missing values for columns with more than 20% missing data\n",
     "movie_basics_cleaned = movie_basics_df.fillna(movie_basics_df.median())\n",
     "movie_basics_cleaned"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 20,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "text/plain": [
        "movie_id           0.000000\n",
        "primary_title      0.000000\n",
        "original_title     0.014369\n",
        "start_year         0.000000\n",
        "runtime_minutes    0.000000\n",
        "genres             3.700460\n",
        "dtype: float64"
       ]
      },
      "execution_count": 20,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "#check if there are missing vlaues in the cleaned df\n",
     "runtime_minutes_null_check = movie_basics_cleaned.isnull().mean() * 100\n",
     "runtime_minutes_null_check"
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "Once the dataframe has been imputed by using the median, the dataframe is further cleaned by dropping the rows with missing values. As per the cell above, the output shows that the column named genres has 3.7 % of its values missing. \n",
     "Droping the rows makes more sense because the proportion of rows with missing values is very small compared to the overall dataset"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 21,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "text/html": [
        "<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>movie_id</th>\n",
"      <th>primary_title</th>\n",
"      <th>original_title</th>\n",
"      <th>start_year</th>\n",
"      <th>runtime_minutes</th>\n",
"      <th>genres</th>\n",
"    </tr>\n",
"  </thead>\n",
"  <tbody>\n",
"    <tr>\n",
"      <th>0</th>\n",
"      <td>tt0063540</td>\n",
"      <td>Sunghursh</td>\n",
"      <td>Sunghursh</td>\n",
"      <td>2013</td>\n",
"      <td>175.0</td>\n",
"      <td>Action,Crime,Drama</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>1</th>\n",
"      <td>tt0066787</td>\n",
"      <td>One Day Before the Rainy Season</td>\n",
"      <td>Ashad Ka Ek Din</td>\n",
"      <td>2019</td>\n",
"      <td>114.0</td>\n",
"      <td>Biography,Drama</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>2</th>\n",
"      <td>tt0069049</td>\n",
"      <td>The Other Side of the Wind</td>\n",
"      <td>The Other Side of the Wind</td>\n",
"      <td>2018</td>\n",
"      <td>122.0</td>\n",
"      <td>Drama</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>3</th>\n",
"      <td>tt0069204</td>\n",
"      <td>Sabse Bada Sukh</td>\n",
"      <td>Sabse Bada Sukh</td>\n",
"      <td>2018</td>\n",
"      <td>87.0</td>\n",
"      <td>Comedy,Drama</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>4</th>\n",
"      <td>tt0100275</td>\n",
"      <td>The Wandering Soap Opera</td>\n",
"      <td>La Telenovela Errante</td>\n",
"      <td>2017</td>\n",
"      <td>80.0</td>\n",
"      <td>Comedy,Drama,Fantasy</td>\n",
"    </tr>\n",
"    <tr>\n",
```

```
      "      <th>...</th>\n",
      "      <td>...</td>\n",
      "      <td>...</td>\n",
      "      <td>...</td>\n",
      "      <td>...</td>\n",
      "      <td>...</td>\n",
      "      <td>...</td>\n",
      "    </tr>\n",
      "    <tr>\n",
      "      <th>146138</th>\n",
      "      <td>tt9916428</td>\n",
      "      <td>The Secret of China</td>\n",
      "      <td>The Secret of China</td>\n",
      "      <td>2019</td>\n",
      "      <td>87.0</td>\n",
      "      <td>Adventure,History,War</td>\n",
      "    </tr>\n",
      "    <tr>\n",
      "      <th>146139</th>\n",
      "      <td>tt9916538</td>\n",
      "      <td>Kuambil Lagi Hatiku</td>\n",
      "      <td>Kuambil Lagi Hatiku</td>\n",
      "      <td>2019</td>\n",
      "      <td>123.0</td>\n",
      "      <td>Drama</td>\n",
      "    </tr>\n",
      "    <tr>\n",
      "      <th>146140</th>\n",
      "      <td>tt9916622</td>\n",
      "      <td>Rodolpho Teóphilo - O Legado de um Pioneiro</td>\n",
      "      <td>Rodolpho Teóphilo - O Legado de um Pioneiro</td>\n",
      "      <td>2015</td>\n",
      "      <td>87.0</td>\n",
      "      <td>Documentary</td>\n",
      "    </tr>\n",
      "    <tr>\n",
      "      <th>146141</th>\n",
      "      <td>tt9916706</td>\n",
      "      <td>Dankyavar Danka</td>\n",
      "      <td>Dankyavar Danka</td>\n",
      "      <td>2013</td>\n",
      "      <td>87.0</td>\n",
      "      <td>Comedy</td>\n",
      "    </tr>\n",
      "    <tr>\n",
      "      <th>146143</th>\n",
      "      <td>tt9916754</td>\n",
      "      <td>Chico Albuquerque - Revelações</td>\n",
      "      <td>Chico Albuquerque - Revelações</td>\n",
      "      <td>2013</td>\n",
      "      <td>87.0</td>\n",
      "      <td>Documentary</td>\n",
      "    </tr>\n",
      "  </tbody>\n",
      "</table>\n",
      "<p>140734 rows × 6 columns</p>\n",
      "</div>"
     ],
     "text/plain": [
      "         movie_id                                 primary_title  \\\n",
      "0       tt0063540                                     Sunghursh   \n",
      "1       tt0066787             One Day Before the Rainy Season   \n",
      "2       tt0069049                  The Other Side of the Wind   \n",
      "3       tt0069204                                  Sabse Bada Sukh   \n",
      "4       tt0100275                    The Wandering Soap Opera   \n",
      "...           ...                                         ...   \n",
      "146138  tt9916428                           The Secret of China   \n",
      "146139  tt9916538                           Kuambil Lagi Hatiku   \n",
      "146140  tt9916622  Rodolpho Teóphilo - O Legado de um Pioneiro   \n",
```

```
        "146141  tt9916706                                Dankyavar Danka   \n",
        "146143  tt9916754              Chico Albuquerque - Revelações   \n",
        "\n",
        "                                    original_title  start_year  \\\n",
        "0                                         Sunghursh        2013   \n",
        "1                                    Ashad Ka Ek Din        2019   \n",
        "2                          The Other Side of the Wind        2018   \n",
        "3                                    Sabse Bada Sukh        2018   \n",
        "4                               La Telenovela Errante        2017   \n",
        "...                                               ...         ...   \n",
        "146138                         The Secret of China        2019   \n",
        "146139                         Kuambil Lagi Hatiku        2019   \n",
        "146140  Rodolpho Teóphilo - O Legado de um Pioneiro        2015   \n",
        "146141                               Dankyavar Danka        2013   \n",
        "146143                Chico Albuquerque - Revelações        2013   \n",
        "\n",
        "        runtime_minutes                 genres  \n",
        "0                 175.0     Action,Crime,Drama  \n",
        "1                 114.0        Biography,Drama  \n",
        "2                 122.0                  Drama  \n",
        "3                  87.0           Comedy,Drama  \n",
        "4                  80.0   Comedy,Drama,Fantasy  \n",
        "...                 ...                    ...  \n",
        "146138             87.0  Adventure,History,War  \n",
        "146139            123.0                  Drama  \n",
        "146140             87.0            Documentary  \n",
        "146141             87.0                 Comedy  \n",
        "146143             87.0            Documentary  \n",
        "\n",
        "[140734 rows x 6 columns]"
       ]
      },
      "execution_count": 21,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "movie_basics_clean_df = movie_basics_cleaned.dropna()\n",
     "movie_basics_clean_df"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 22,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "text/plain": [
        "movie_id           0\n",
        "primary_title      0\n",
        "original_title     0\n",
        "start_year         0\n",
        "runtime_minutes    0\n",
        "genres             0\n",
        "dtype: int64"
       ]
      },
      "execution_count": 22,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "#check to see if there are still any missing data\n",
     "movie_basics_clean_df.isna().sum()\n"
    ]
   },
```

```
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "Initially, there were missing values in the original column title but after dropping the rows
 with missing vlaues, they were dropped as well. "
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 23,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "text/plain": [
        "movie_id           0\n",
        "primary_title      0\n",
        "original_title     0\n",
        "start_year         0\n",
        "runtime_minutes    0\n",
        "genres             0\n",
        "dtype: int64"
       ]
      },
      "execution_count": 23,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "#check to see if there are any missing values  \n",
     "movie_basics_clean_df.isna().sum()\n"
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "<h3>The last datafame called \"movie_basics_clean_df\" is clean</h3>"
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "##### SAVE THE CLEANED df TO A NEW TABLE IN THE DATABASE. The new table is called
 moviesInfo."
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 24,
    "metadata": {},
    "outputs": [],
    "source": [
     "movie_basics_clean_df.to_sql('moviesInfo',conn, if_exists='replace', index=False) "
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "# DATAFRAME 2 DATA CLEANING - movie_ratings_df"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 25,
```

```
 "metadata": {},
 "outputs": [
  {
   "data": {
    "text/plain": [
     "<bound method DataFrame.info of          movie_id  averagerating  numvotes\n",
     "0      tt10356526            8.3        31\n",
     "1      tt10384606            8.9       559\n",
     "2       tt1042974            6.4        20\n",
     "3       tt1043726            4.2     50352\n",
     "4       tt1060240            6.5        21\n",
     "...           ...            ...       ...\n",
     "73851   tt9805820            8.1        25\n",
     "73852   tt9844256            7.5        24\n",
     "73853   tt9851050            4.7        14\n",
     "73854   tt9886934            7.0         5\n",
     "73855   tt9894098            6.3       128\n",
     "\n",
     "[73856 rows x 3 columns]>"
    ]
   },
   "execution_count": 25,
   "metadata": {},
   "output_type": "execute_result"
  }
 ],
 "source": [
  "#check df info\n",
  "movie_ratings_df.info"
 ]
},
{
 "cell_type": "code",
 "execution_count": 26,
 "metadata": {},
 "outputs": [
  {
   "data": {
    "text/plain": [
     "movie_id         0\n",
     "averagerating    0\n",
     "numvotes         0\n",
     "dtype: int64"
    ]
   },
   "execution_count": 26,
   "metadata": {},
   "output_type": "execute_result"
  }
 ],
 "source": [
  "#check to see if there are any null values in the df \n",
  "movie_ratings_df.isna().sum()"
 ]
},
{
 "cell_type": "markdown",
 "metadata": {},
 "source": [
  "There are no null values in this dataframe "
 ]
},
{
 "cell_type": "markdown",
 "metadata": {},
 "source": [
  "# Exploratory Data Analysis\n",
  "Analyzing the two clean tables - moviesInfo and movie_ratings"
 ]
```

```
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "\n",
     "<h2>Curious to find out</h2>\n",
     "\n",
     "<ol> 1. Which movies have the highest and lowest rating?</ol>\n",
     "<ol> 2. What is the distribution of movie ratings?</ol>\n",
     "<ol> 3. What is the common movie genre</ol>\n",
     "<ol> 4. What is the average rating based per each genre?</ol>\n",
     "<ol> 5. what is the rating distribution of popular genres?</ol>\n",
     "\n",
     "\n"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 27,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "text/html": [
        "<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>movie_id</th>\n",
        "      <th>primary_title</th>\n",
        "      <th>start_year</th>\n",
        "      <th>genres</th>\n",
        "      <th>averagerating</th>\n",
        "    </tr>\n",
        "  </thead>\n",
        "  <tbody>\n",
        "    <tr>\n",
        "      <th>0</th>\n",
        "      <td>tt3437164</td>\n",
        "      <td>Maldito Amor</td>\n",
        "      <td>2014</td>\n",
        "      <td>Comedy,History,Horror</td>\n",
        "      <td>1.1</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>1</th>\n",
        "      <td>tt1865374</td>\n",
        "      <td>Futures Past</td>\n",
        "      <td>2012</td>\n",
        "      <td>Action,Biography,History</td>\n",
        "      <td>1.3</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>2</th>\n",
```

```
"      <td>tt5161302</td>\n",
"      <td>Eyal Hirrifah</td>\n",
"      <td>2015</td>\n",
"      <td>Comedy,Musical,Sport</td>\n",
"      <td>1.4</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>3</th>\n",
"      <td>tt0937353</td>\n",
"      <td>The Devil's Flower</td>\n",
"      <td>2010</td>\n",
"      <td>Mystery,Romance</td>\n",
"      <td>1.7</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>4</th>\n",
"      <td>tt0249516</td>\n",
"      <td>Foodfight!</td>\n",
"      <td>2012</td>\n",
"      <td>Action,Animation,Comedy</td>\n",
"      <td>1.9</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>...</th>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>918</th>\n",
"      <td>tt5903964</td>\n",
"      <td>The Long Count Teaser</td>\n",
"      <td>2016</td>\n",
"      <td>History,Sport</td>\n",
"      <td>9.2</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>919</th>\n",
"      <td>tt3856476</td>\n",
"      <td>Sunakali</td>\n",
"      <td>2017</td>\n",
"      <td>Documentary,Family,Musical</td>\n",
"      <td>9.3</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>920</th>\n",
"      <td>tt4135932</td>\n",
"      <td>Lost Conquest</td>\n",
"      <td>2015</td>\n",
"      <td>Comedy,Documentary,Fantasy</td>\n",
"      <td>9.4</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>921</th>\n",
"      <td>tt10146728</td>\n",
"      <td>Foosballers</td>\n",
"      <td>2019</td>\n",
"      <td>Comedy,Documentary,Sport</td>\n",
"      <td>9.7</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>922</th>\n",
"      <td>tt1740810</td>\n",
"      <td>Love on a Leash</td>\n",
"      <td>2010</td>\n",
"      <td>Documentary,Family,Romance</td>\n",
"      <td>9.7</td>\n",
```

```
        "    </tr>\n",
        "  </tbody>\n",
        "</table>\n",
        "<p>923 rows × 5 columns</p>\n",
        "</div>"
       ],
       "text/plain": [
        "       movie_id          primary_title  start_year  \\\n",
        "0     tt3437164           Maldito Amor        2014   \n",
        "1     tt1865374           Futures Past        2012   \n",
        "2     tt5161302          Eyal Hirrifah        2015   \n",
        "3     tt0937353     The Devil's Flower        2010   \n",
        "4     tt0249516            Foodfight!        2012   \n",
        "..          ...                    ...         ...   \n",
        "918   tt5903964  The Long Count Teaser        2016   \n",
        "919   tt3856476              Sunakali        2017   \n",
        "920   tt4135932          Lost Conquest        2015   \n",
        "921  tt10146728            Foosballers        2019   \n",
        "922   tt1740810        Love on a Leash        2010   \n",
        "\n",
        "                           genres  averagerating  \n",
        "0         Comedy,History,Horror            1.1  \n",
        "1      Action,Biography,History            1.3  \n",
        "2          Comedy,Musical,Sport            1.4  \n",
        "3               Mystery,Romance            1.7  \n",
        "4       Action,Animation,Comedy            1.9  \n",
        "..                          ...            ...  \n",
        "918               History,Sport            9.2  \n",
        "919  Documentary,Family,Musical            9.3  \n",
        "920  Comedy,Documentary,Fantasy            9.4  \n",
        "921    Comedy,Documentary,Sport            9.7  \n",
        "922  Documentary,Family,Romance            9.7  \n",
        "\n",
        "[923 rows x 5 columns]"
       ]
      },
      "execution_count": 27,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "#join the two dataframes together based group by \n",
     "query_movie_info = \"\"\"SELECT mi.movie_id, mi.primary_title, mi.start_year, mi.genres,
 mr.averagerating \n",
     "                        FROM moviesInfo mi\n",
     "                        JOIN movie_ratings mr\n",
     "                        ON mi.movie_id = mr.movie_id\n",
     "                        GROUP BY genres\n",
     "                        order by mr.averagerating ;\n",
     "                        \n",
     "                    \"\"\"\n",
     "joined_movie_df = pd.read_sql(query_movie_info, conn)\n",
     "joined_movie_df\n"
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "#### <ol> 1. Which movies have the highest and lowest rating?</ol>"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 28,
    "metadata": {},
    "outputs": [
     {
```

```
       "data": {
        "text/html": [
         "<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>primary_title</th>\n",
         "      <th>genres</th>\n",
         "      <th>averagerating</th>\n",
         "    </tr>\n",
         "  </thead>\n",
         "  <tbody>\n",
         "    <tr>\n",
         "      <th>922</th>\n",
         "      <td>Love on a Leash</td>\n",
         "      <td>Documentary,Family,Romance</td>\n",
         "      <td>9.7</td>\n",
         "    </tr>\n",
         "    <tr>\n",
         "      <th>921</th>\n",
         "      <td>Foosballers</td>\n",
         "      <td>Comedy,Documentary,Sport</td>\n",
         "      <td>9.7</td>\n",
         "    </tr>\n",
         "    <tr>\n",
         "      <th>920</th>\n",
         "      <td>Lost Conquest</td>\n",
         "      <td>Comedy,Documentary,Fantasy</td>\n",
         "      <td>9.4</td>\n",
         "    </tr>\n",
         "    <tr>\n",
         "      <th>919</th>\n",
         "      <td>Sunakali</td>\n",
         "      <td>Documentary,Family,Musical</td>\n",
         "      <td>9.3</td>\n",
         "    </tr>\n",
         "    <tr>\n",
         "      <th>918</th>\n",
         "      <td>The Long Count Teaser</td>\n",
         "      <td>History,Sport</td>\n",
         "      <td>9.2</td>\n",
         "    </tr>\n",
         "    <tr>\n",
         "      <th>917</th>\n",
         "      <td>Ratne Price Sa Kosara</td>\n",
         "      <td>Documentary,History,War</td>\n",
         "      <td>9.2</td>\n",
         "    </tr>\n",
         "    <tr>\n",
         "      <th>916</th>\n",
         "      <td>Los días de Ayotzinapa (The 43s)</td>\n",
         "      <td>Crime,Documentary,Drama</td>\n",
         "      <td>9.2</td>\n",
         "    </tr>\n",
         "    <tr>\n",
```

```
        "      <th>915</th>\n",
        "      <td>Sweet Science</td>\n",
        "      <td>Action,Documentary,Sport</td>\n",
        "      <td>9.2</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>914</th>\n",
        "      <td>Road to Pride</td>\n",
        "      <td>Comedy,Documentary,Romance</td>\n",
        "      <td>9.1</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>913</th>\n",
        "      <td>Blood Army</td>\n",
        "      <td>War</td>\n",
        "      <td>9.0</td>\n",
        "    </tr>\n",
        "  </tbody>\n",
        "</table>\n",
        "</div>"
       ],
       "text/plain": [
        "                         primary_title                       genres  \\\n",
        "922                    Love on a Leash  Documentary,Family,Romance   \n",
        "921                        Foosballers    Comedy,Documentary,Sport   \n",
        "920                      Lost Conquest  Comedy,Documentary,Fantasy   \n",
        "919                           Sunakali  Documentary,Family,Musical   \n",
        "918               The Long Count Teaser               History,Sport   \n",
        "917               Ratne Price Sa Kosara     Documentary,History,War   \n",
        "916  Los días de Ayotzinapa (The 43s)     Crime,Documentary,Drama   \n",
        "915                      Sweet Science    Action,Documentary,Sport   \n",
        "914                      Road to Pride  Comedy,Documentary,Romance   \n",
        "913                         Blood Army                         War   \n",
        "\n",
        "     averagerating  \n",
        "922            9.7  \n",
        "921            9.7  \n",
        "920            9.4  \n",
        "919            9.3  \n",
        "918            9.2  \n",
        "917            9.2  \n",
        "916            9.2  \n",
        "915            9.2  \n",
        "914            9.1  \n",
        "913            9.0  "
       ]
      },
      "execution_count": 28,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "#top 10 highest rated movies \n",
     "top_rated_movies = joined_movie_df.sort_values(by=\"averagerating\",
 ascending=False).head(10)\n",
     "top_rated_movies[['primary_title','genres','averagerating']]\n"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 29,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "text/html": [
        "<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>primary_title</th>\n",
"      <th>genres</th>\n",
"      <th>averagerating</th>\n",
"    </tr>\n",
"  </thead>\n",
"  <tbody>\n",
"    <tr>\n",
"      <th>0</th>\n",
"      <td>Maldito Amor</td>\n",
"      <td>Comedy,History,Horror</td>\n",
"      <td>1.1</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>1</th>\n",
"      <td>Futures Past</td>\n",
"      <td>Action,Biography,History</td>\n",
"      <td>1.3</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>2</th>\n",
"      <td>Eyal Hirrifah</td>\n",
"      <td>Comedy,Musical,Sport</td>\n",
"      <td>1.4</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>3</th>\n",
"      <td>The Devil's Flower</td>\n",
"      <td>Mystery,Romance</td>\n",
"      <td>1.7</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>4</th>\n",
"      <td>Foodfight!</td>\n",
"      <td>Action,Animation,Comedy</td>\n",
"      <td>1.9</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>5</th>\n",
"      <td>The Hospital 2</td>\n",
"      <td>Adult,Horror</td>\n",
"      <td>2.0</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>6</th>\n",
"      <td>Battle Earth</td>\n",
"      <td>Action,Sci-Fi,War</td>\n",
"      <td>2.1</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>7</th>\n",
"      <td>Fahr zur Hölle</td>\n",
"      <td>Action,Mystery</td>\n",
"      <td>2.2</td>\n",
"
```

```
    "    </tr>\n",
    "    <tr>\n",
    "      <th>8</th>\n",
    "      <td>Ladies Mafia</td>\n",
    "      <td>Adventure,Crime,Romance</td>\n",
    "      <td>2.3</td>\n",
    "    </tr>\n",
    "    <tr>\n",
    "      <th>9</th>\n",
    "      <td>The Broken Key</td>\n",
    "      <td>History,Sci-Fi,Thriller</td>\n",
    "      <td>2.3</td>\n",
    "    </tr>\n",
    "  </tbody>\n",
    "</table>\n",
    "</div>"
   ],
   "text/plain": [
    "        primary_title                    genres  averagerating\n",
    "0        Maldito Amor     Comedy,History,Horror            1.1\n",
    "1        Futures Past  Action,Biography,History            1.3\n",
    "2       Eyal Hirrifah      Comedy,Musical,Sport            1.4\n",
    "3  The Devil's Flower           Mystery,Romance            1.7\n",
    "4          Foodfight!   Action,Animation,Comedy            1.9\n",
    "5      The Hospital 2              Adult,Horror            2.0\n",
    "6        Battle Earth         Action,Sci-Fi,War            2.1\n",
    "7      Fahr zur Hölle            Action,Mystery            2.2\n",
    "8        Ladies Mafia   Adventure,Crime,Romance            2.3\n",
    "9      The Broken Key   History,Sci-Fi,Thriller            2.3"
   ]
  },
  "execution_count": 29,
  "metadata": {},
  "output_type": "execute_result"
 }
],
"source": [
 "#top 10 lowest rated movies\n",
 "lowest_rated_movies = joined_movie_df.sort_values(by='averagerating').head(10)\n",
 "lowest_rated_movies[['primary_title', 'genres', 'averagerating']]"
]
},
{
"cell_type": "markdown",
"metadata": {},
"source": [
 "### 2. Distribution of movie ratings."
]
},
{
"cell_type": "code",
"execution_count": 30,
"metadata": {},
"outputs": [
 {
  "data": {
   "image/png":
```

"iVBORw0KGgoAAAANSUhEUgAAAYAAAAEWCAYAAABv+EDhAAAAOXRFWHRTb2Z0d2FyZQBNYXRwbG90bGliIHZlcnNpb24zLjMuM
SwgaHR0cHM6Ly9tYXRwbG90bGliLm9yZy/d3fzzAAAACXBIWXMAAAsTAAALEwEAmpwYAAAjT0lEQVR4nO3de5wcVZ338c8Xkiz
CgOE6GcgNDcKyCsqMLi4qMyAuLijICoKCQdG4z7qIyrpEF0F3dcHdxX3Ay6MoSBRhCIiAeI3RAfERJQNyUXDJcguQCyAhTERC4
Ld/1BnpTLp7ai7V3TP1fb9e/Zru6qpTvzndXb+qU6dOKSIwM7Py2aLZAZiZWXM4AZiZlZQTgJlZSTkBmJmVlBOAmVlJOQQGYmZW
UE0BJSPqSpI+PU1mzJQ1I2jK97pP0nvEoO5X3fUnzx6u8Eaz3U5IelbSq0euerJr1WVo+8nUAE5+k+4B2YCPwLPPBb4OvA+RHx3
CjKek9E/HgEy/QBF0fEV0eyrrTsJ4B5EXH8SJcdT5JmAf8NzImNf8NzImINSNYrhv4KXBaRPx7MdE1jqQA/gAE8ARwGfCRiHg2x7KfoAU
+S8vPRwCTx5siYltgDnA2cBpwwXivRNKU8S6zcBpwwXivRNKU8S6zcRcwBHhvJxj+ZD/w+/R13TarvfSOiDTgQeBvw7ibEYI0QEX5M8AdwH/D6IdNeB
TwHvDS9vgj4VHq+E3AtsJzs4/Uzsp2DZ6Bb6RlngIGgH8C5pLtDZ4EPABcXzFtSiqvDzgL
urSjvPen5FsDpwP3AGrIjmxem9wbjmJ9iexT45zr19MK0/COpvNNT+a9P//NzKY6Lctb71sCTwLHp/+hK0xcCVwyZ91zgvIo4L
gBWAg8BnwK2TO+dCPwe+K/02XXKeDHwE+Cx9D9+E5heIsVJ9to/VfH4+cCFIf/HCmA
d0A+8Nk3P81meCNwA/CfwOHv+f9/4F96vxPQbYXP/h6MfCFIf/HCmA
d0A+8Nk3P81meCNwA/CfwOHAv8MaKsncn+349CfwY+ALZkSXAVsDFqAjcB7c3+7U30h48AJqmI+BXwIPDaKm+fmt7rIKs6+mgIeI8NhwHQWtCnYc6OmdwuWvm8HGwyeQpQ6h
GPZInEC2Yb0TRHRFps2aRwI/Dnw1zVW+U6yPcSSZqyzssR4w+AfwMuS+vbt8psJ6ZHD/AioA34/JB5XgPsCRwMnCHpz2us8n

kG98Xpf/nncC7ImvueiPwcIrjxOFiT/6WbGN3OfDDVB7ApcDfSNoOIJ0rOQa4JL2/iKyO5gGvAN4AVJ5D+UvgHmAX4NOAyBLsr
mSfwSzgE6nsacC3yRL8DmndbxksSNJ+wIXA+4AdgS8D10j6s+H+OUl7kX1/lldMvgl4eVrXJcDlkrbK+VkO/m+/I9sJ+XfgAkl
K711CthOxY/r/TqhYbj7ZZzcrvf93ZEnbxsAJYHJ7mOyHOtQzQAdZe/czEfGzSLtZdXwiItZHRK0f3Tci4o6IWA98HDhm8CTxG
L0D+GxE3BMRA8BHgWOHNI18MiKeiohbgVuBzTY+KZa3AR+NiCcj4j7gHDbdyIzUfLIN3rNkG6/jJE2NiPuBm4Ej03wHAX+IiBs
ltZMlmw+m+lxDtrd/bEW5D0fE5yJiY/q/lkfEkoh4OiIeAT5LlsAA9gemkB1dPBMRV5JtRAe9F/hyRPwyIp6NiEXA02m5Wm6Wt
B64k2wP/ouDb0TExRHxWIrtHODPyJJvXvdHxFdSnS0i+x62S5oNvBI4IyI2RMQNwDUVyz1DtuGfl/6P/ohYN4L1WhVOAJPbbmT
NCEP9B9le3Y8k3SNpYY6yVozg/fuBqWR7eWO1ayqvsuwpZEcugyp77fyB7ChhqJ2AaVXK2m00QaWTxj1kzTGQNXttBRyWXl8CH
Jeev53n9/7nkNXNSklrJa0l2yvfpaL4Tepa0i6SeiU9JGkdWVPIYN3uCjw0JIFXLj8HOHVwXWl9s9JytexHVodvI9tj36YillM
l3SnpiVTWCxnZ5/ynzyoi/pCetqV4fl8xbej/8Q2yo6xeSQ9L+ndJU0ewXqvCCWCSkvRKso3bDUPfS3vAp0bEi4A3AR+WdPDg2
zWKHO4IYVbF89lke2yPAuvJ2soH49qSrOkpb7kPk23EKsveCKweZrmhHk0xDS3roRGWM+gEst/Pd1K30XvIEsBgM9DlQLekmWR
NMoMJYAXZHvhOETE9PbaLiL+oKHtonZyVpu0TEdsBx5M1C0F2HmG3imYU2PSzWAF8umJd0yNi64i4tN4/F5nFwC+AMwAkvZasc
8ExwPYRMZ3snM/gusfSpXAlsIOkrSum/en/SEc3n4yIvYG/Ijuv8U5sTJwAJhlJ20k6HOglO4F2e5V5Dpc0L2001pF1HR3s5re
arI18pI6XtHf6Af8L2UnQZ8m6Vm4l6bC0x3Y6WbPBoNXAXEm1vouXAh+StLukNp5vZ944kuBSLIuBT0vaVtIc4MNke9Oj8U7gk
2Tt4YOPvwUOk7RjaqrpA74G3BsRd6Y4VgI/As5Jn9UWkl4s6cDN1vC8bcnONayVtBvwkYr3fkH22f2DpCmSjiDrADDoK8DfSfp
LZbZJn8W2Of/Ps4EFkmakODaSnUSfIukMYLuKeYf7LGtKzWbLgE9Imibp1WQ7JwBI6pH0srQDsY4smQ/bNdXqcwKYPL4j6UmyP
b5/JmsnfleNefcg62UxQLYB+WJE9KX3zgJOT80F/ziC9X+D7ETkKrI94Q8ARMQTwN8DXyXb215PdgJ60OXp72OSbq5S7oWp7Ov
Jeo38ETh5BHFVOjmt/x6yI6NLUvkjIml/sh5IX4iIVRWPa8ia1gabfi4h62F0yZAi3knWHPVbst4wV5C1hdfySbJmmSeA7wJXD
r4RERuAo8h6aa0lOzq4luwog4hYRnYe4PNpXcvJTqrnknYgriNLOj8Evk+W1O8n+ywqm2mG+yyH8w7g1WQ9fT5F1pvp6fTeDLJ
6Wkd2buI6Rp+8LfGFYGaTjKRfAl+KiK81O5axkHQZcFdEnNnsWCYrHwGYTXCSDpQ0IzUBzQf2AX7Q7LhGStIrU3PYFpIOBY4Ar
mpyWJPaZL2q06xM9iQ7v9EG/A/w1nSuYaKZQda8tSNZM+H/iYhbmhvS5OYmIDOzknITkJlZSU2IJqCddtop5s6d2+wwRmX9+vV
ss802w89YQq6b2lw31bleaqtWN/39/Y9GxM41FpkYCWDu3LksW7as2WGMSl9fH93d3c0OoyW5bmpz3VTneqmtWt1Iur/63Bk3A
ZmZlZQTgJlZSTkBmJmVlBOAmVlJOQGYmZWUE4CZWUk5AZiZlZQTgJlZSTkBmJmVlBOA2QTVMXM2kjZ5dMyc3eywbAKZEENBmNn
mVj20gjmnXbvJtPs/c3iTorGJyEcAZmYl5QRgZlZSTgBmZiXlBGBmVlKFJgBJ0yVdIekuSXdKerWkHSQtkXR3+rt9kTGYmVl1R
R8BnAv8ICL2AvYF7gQWAksjYg9gaXptZmYNVlgCkLQd8DrgAoCI2BARa4EjgEVptkXAkUXFYGZmtRV5BPAi4BHga5JukfRVSds
A7RGxEiD93aXAGMzMrAZFRDEFS13AjcABEfFLSecC64CTI2J6xXyPR8Rm5wEkLQAWALS3t3f29vYWEmfRBgYGaGtra3YYLcl1U
1ueuunv72fajHmbTNuwajmdnZ1FhtZU/s7UVq1uenp6+iOiq9YyRSaAGcCNETE3vX4tWXv/PKA7IlZK6gD6ImLPemV1dXWFbwo
/+bhuastTN5KqXglc1G+6Ffg7U1uNm8LXTQCFNQFFxCpghaTBjfvBwG+Ba4D5adp84OqiYjAzs9qKHgvoZOCbkqYB9wDvIks6i
yWdBDwAHF1wDGZmVkWhCSAifg1UO/w4uMj1mpnZ8HwlsJlZSTkBmJmVlBOAmVlJOQGYmZWUE4CZ1eTbTk5uviWkmdXk205Obj4
CMDMrKScAM7OScgIwMyspJwAzs5JyAjAzKyknADOzknICMDMrKScAM7OScgIwKyFf4WvgK4HNSslX+Br4CMDMrLScAMzMSsoJw
MyspJwAzMxKygnAzKyknADMzErKCcDMrKScAMzMSqrQC8Ek3Qc8CTwLbIyILkk7AJcBc4H7gGMi4vEi4zAzs8014gigJyJeHhF
d6fVCYGlE7AEsTa/NzKzBmtEEdASwKD1fBBzZhBjMzEpPEVFc4dK9wONAAF+OiPMlrY2I6RXzPB4R21dZdgGwAKC9vb2zt7e3s
DiLNDAwQFtbW7PDaEmum9ry1E1/fz/TZszbZNqGVcvp7Owctvy8y45lHUXwd6a2anXT09PTX9H6spmiE8CuEfGwpF2AJcDJwDV
5EkClrq6uWLZsWWFxFqmvr4/u7u5mh9GSXDe15akbSVUHdMvzm8677FjWUQR/Z2qrVjeS6iaAQpuAIuLh9HcN8G3gVcBqSR0pu
A5gTZExmJlZdYUlAEnbSNp28DnwBuAO4BpgfpptPnB1UTGYmVltRXYDbQe+LWlwPZdExA8k3QQslnQS8ABwdIExmJlZDYUlgIi
4B9i3yvTHgIOLWq+ZmeXjK4HNzErKCcCsxXTMnE1/f7/v12uF8z2BzVrMqodWMG3GvE26X/p+vVYEHwGYmZWUE4CZWUk5AZiZl
dSIEoCkLSRtV1QwZmbWOMMmAEmXSNouXc37W+B3kj5SfGhmZlakPEcAe0fEOrJhm78HzAZOKDIoMzMrXp4EMFXSVLIEcHVEPEM
2vLOZmU1geRLAl8lu3bgNcL2kOcC6IoMyM7PiDXshWESCB5xXMel+ST3FhWRmZo2Q5yRwu6QLJH0/vd6b54dzNjOzCSpPE9BFw
A+BXdPr/wY+WFA8ZmbWIHkSwE4RsRh4DiAiNgLP5F0XPMel+ST3FhWRmZo2Q5yRwu6QLJH0/vd6b54dzNjOzCSpPE9BFw
RmZlZ4fL0ArpZ0oHAnoCA36VrAczMbAKrmQAkHRQRP5F01JC3XiKJiLiy4NjMzKxA9Y4ADgR+ArypnsBOAGYmU1gNRNARJyZn
r4nItzrx8xsksnTC+heSedLOliSCo/IzMwaIk8C2BP4MfB+smTweUmvKTYsMzMr2rAJICKeiojFEXEU8ApgO/hhw8FjKMzOzsas3HPR59RaMiA+MfzhmZtYo9
Y4A/g64A1gMPEx2MxgzM5sk6iWADuBo4G3ARuAy4FsR8XgjAjMzs2LVPAkcEY9FxJciogc4EZgO/EbSCQ2KzczMCjTsSWBJ+wH
HkfXY+T7QX3RQZmZWvHongT8JHE42kFsv8NGI2NiowMzMrFj1jgA+DtwD7Jse/5ZuCCYgImKf4sMzM7Oi1EsAuzcsCrMJqmPmb
FY9tGKTaTN2m8XKBx9oUkRm+dW7Kfz9jQzEbCJa9dCKqoOlmU0Eue4IZmZmk48TgJlZSdVMAJKWpr+faVw4ZjYRdcycjaRNHh0
zZzc7LBtG3SuBJR1INqZ/L0OGgoiImwuNzMwmDJ8LmZjqJYAzyG7YPhP47JD3AjioqKDMzKx49XoBXQFcIenjEfGvDYzJzMwaI
M/9AP5V0puB16VJfRFxbb1lzMys9Q3bC0jSWcApwG/T45Q0zczMJrA83UAPAw6JiAsj4kLg0DTNzHKq1kumkJ4yW051bxzLbdg
moGQ68Pv0/IXFhGI2eVXrJQMF9JR59hn3xrHc8iSAs4BbJP2UrCvo64CPFhqVmZkVLs9J4Esl9QGvJEsAp0XEqqIDMzOzYuVqA
oqIlcA1BcdiZmYN5LGAzMxKygnAzKyk6iYASVtOxE8DB0XEvsStKvJN0q6TfpFpNI2kHSEkl3p7/bj6Z8MzMbm7oJICKeA26VNJq
OxE8DB0XEvsEyuIumM0BUvaStKvJN0q6TfpFpNI2kHSEkl3p7/bj6Z8MzMbm7oJICKeA26VNJqOxE8DB0XEvsEyuIumM0BUvaStKvJN0q6TfpFpNI2kHSEkl3p7/bj6Z8MzMbm7oJICKeA26VNJq
OxE8DB0XEvsDLgUMl7U82vtDSiNgDWJpem5lZg+U5CdwB/EbSr3p7/bj6Z8MzMbm7oJICKeA26VNJqOxE8DB0XEvsDLgUMl7U82vtDSiNgDWJpem5lZg+U5CdwB/EbSr3p7/bj6Z8MzMbm7oJICKeA26VNJq
rbTdWbIhoTeTERcN2zh0pZAPzAP+EJEnCZpbURMr5jn8YjYrBlI0gJgAUB7e3tnb2/vcKtrSQMDA7S1tTU7jJY0Geqmv7+faTP
mbTJtw6rldHZ2DjtfvXln7T6P1U+NvMwNq5aPOp5GzHfbbbfzzDMbGGrq1Gnss8/LNps+1GT4zhSlWt309PT0R0RXrWWGTQAAk
uYAe0TEjyVtDWwZEU/mDUzSdODbwMnADkjqqeqVt0N/V9XmqzfveRdfxTm3Txl
2vmrrHm08zZqv1rzVTIbvTFGq1Y2kugkgz2Bw7wWuAL6cJu0GXDWSwCJiLVlTz6HAakkdqewOYM1IyjIzs/GRpxvo+4EDgHUAE
XE3sMtwC0naOe35I+kFwOuBu8guKJufZpsPXD3iqM3GkW9naGWV5yTw0xGxQcruCClpCtnJ3OF0AIvSeYAtgMURca2kXwCLZ0
EPAAcPbrQzcaHb2doZZUnAVwn6WPACyQdAvw98CyIn24BXVJn+GHDwSAM1M7PxlacJaCHwCHA78D7ge8DpRQZlZmbFyzMa6
HOSFgG/JGv6+V3kOV1vZq0h3STGbKhhE4Ckw4AvAf9DNhz07pLeFxHfLzo4MxsHvkmM1ZDnHMA5QE9ELAeQ9GLgu4GLgu4ATgJnBJb
nHMCawY1/cg/uu29mNuHVPAKQdFR6+htJ3wMWk50DOBq4qQGxmZlZgeo1Ab2p4vlqYHBMoEcAD+FsZjbB1UwAEfGuRgZiZmaNl
acX0O5kg7jNrZx/uOGgzcysteXpBXQVcAHZ1b/PFRqNmZk1TJ4E8MeIOK/wsIOK/wSMzMrKHyJIBzZ0J/IjsNo8ARMTNhUVlZptqpat
588bSSjFbVXkSwMuAE4CDeL4JKNJrM2uEVrqaN28srRSzVZUnAbwFeFFEbH4fNzMzm7DyXAl8KzC94CDjMrNlSk03lwya3PEcA7
cBdkm5i03MA7gZqNpm4yaZ08iSAMwuPwszMGi7P/QCua0QgZpOGe780XcfM2ax6aMUm02bsNouVDz7QpIhaU54rgZ/k+XsATwO
mAusjYrsiAzObsNyU0nS+z3M+eY4Atq18LelI4FVFBWRmZo2RpxfQJiLiKnwNgDVRx8zZm/VW6Zg5e9TzmZVVniagoypebgF08
XyTkFnD5T28dzOAWX15egFV3hdgI3AfcEQh0ZiZWcPkOQfg+wKYmU1C9W4JeUad5SIi/rVewZJmAV8HZpCNIXR+RJwraQfgQfgR
7C9wHHBMRj48wbrPJwV1GrYnqHQGsrzJtG+AkYEegbgIgay46NSJulrQt0C9pCXAisDQizpa0EFgInDbiyIvM0mA3cZtSaqd0vIc

wafpw34KcC7gF7gnFrLVSy/EliZnj8p6U5gN7LzB91ptkVAH04AZmYNp4jaHXpSc82HgXeQbazPHU1zjaS5wPXAS4EHImJ6xXu
PR8RmN5mXtABYANDe3t7Z29s70tW2hIGBAdra2podRksabd309/czbca8TaZtWLWczs7OcZzvfxja2W3q1Gnss8/Lcq0jz7R68
87afR6rnxp5mRNxWjY9X33n/c7k/ewnk2p109PT0x8RXbWWqZkAJP0HcBRwPvCFiBgYTVCS2oDrgE9HxJWS1uZJAJW6urpi2bJ
lo1l90/X19dHd3d3sMFrSaOtGUtVmk6Hf5bHON97LDp1Wb97zLr6Kc26fMux8k2FavXmH1nfe70zez34yqVY3kuomgHoXgp0K7
AqcDjwsaV16PClpXZ6AJE0FvgV8MyKuTJNXS+pI73cAa/KUZWZm46tmAoiILSLiBRGxbURsVURVV/HYNs84QMq6NlwA3BkRn6146xp
gfno+H7h6LP+AmZmNTp4LwUbrALJbSd4u6ddp2seAs4HFkk4CHgCOOLjAGMzOrobAEEBE3ALU6OB9c1HrNzCyfEQ8GZ2Zmk4MTg
JlNGLfddrtHeB1HRZ4DMDMbV888s8FXTo8jHwGYmZWUE4CZTWxpQL3Kx1iU6UZCbgIys4ltnAfUK9ONhHwEYGZWUk4A1hQdM2f
T399fisNss1blJiBrilUPrWDajHmbHGpP1sNss1blIwAzs5JyAjCz1jTOvXtsc24CMrPWVKV3D9zVlFAmKx8BmJmVlBOAmVlJO
QHYuKl2BaW7d5q1Lp8DsHFT7QpKcPdOs1blIwAzs5JyArDJwV0GbThVviNlb550E5BNDuM8IJhNQv6ObMZHAGZmJeUEYGZWUk4
AZmYl5QRgZlZSTgBmZiVVWAKQdKGkNZLuqJi2g6Qlku5Of7cvav1m485dTW2SKbIb6EXA54GvV0xbxCCyNiLMlLUyvTyswBrPx4
26ENskUdgQQEdcDvx8y+QhgUXq+CDiyqPWbmVl9iojiCpfmAtdExD5J+bEv67e7e3sLiLNLAwAB
tbW3NDqMh+vv7mTZj3mbTN6xaTmdn52bzztp9Hqufqj9f3vVsWLU897RqsYylvNFOqzdvtbppRozNroeh03aZ8kfWbNxqXOPJ+
33I891spmrbmp6env6I6Kq1TMsmgEpdXV2xbNmywuIsUl9fH93d3c0OoyEk1RwMbuj3TBLnXXwV59w+pe58eddz/2cOzz2tWix
jKW+00+rNW61umhFjs+th6LSTd76Lzz2y17jGk/f7UOS2cjxU29ZIqpsAGt0LaLWkDoD0d02D129mZkjE8A1wPz0fD5wdYPXb
xNMtXsMmNn4KKwXkKRLgW5gJ0kPAmcCZwOLJZ0EPAAcXdT6bXKodo8B97wxGx+FJYCIOK7GWwcXtU4zM8vPVwKbmZWU7wdg5ZK
u5jUzJwArG1/Na/YnbgIyMyspJ4CSqNadsmH3Q/UgamYtyU1AJdHU7pRudfFrST4CMDMrKScAGxVFoWs28bkJyEbFV+iaTXw+A
jAzKyknANuEewuZ5dPU38o4cROQbcwzQzNoD4CMDMrKScAM7OScgKY4BrSDum2UzGtTYEDMoS3PfRkgJHvfd9SpjqDKb3dWuNZVWvm8gM8BTHANaYd027xZPhP
st+IjADOzknICaFFjatM+JjZgaUJ5PfzD3HvQ8Q9sgVNebWSaE4TdWCkbDXmBbbHdsRjj+9Vr/ZMjYoJsRMHBcPCCgOEMfcDqGyOy94tl8OgmaudTqIR18uiFdZZ//s4rmBq9p/...

"text/plain": [
"<Figure size 432x288 with 1 Axes>"
]
},
"metadata": {
"needs_background": "light"
},
"output_type": "display_data"
}
],

```
   "source": [
    "joined_movie_df['averagerating'].hist(bins=60, edgecolor=\"black\")\n",
    "plt.title(\"Distribution of  Average Ratings\")\n",
    "plt.xlabel(\"Average Rating\")\n",
    "plt.ylabel(\"Number of Movies\")\n",
    "plt.show()"
   ]
  },
  {
   "cell_type": "markdown",
   "metadata": {},
   "source": [
    "Most of the movie ratings in the IMDB database have an average rating of 6 out of 10  "
   ]
```

```
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "what is the mode of the ratings in the database\n"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 31,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "text/plain": [
        "0    6.4\n",
        "dtype: float64"
       ]
      },
      "execution_count": 31,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "joined_movie_df['averagerating'].mode()"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 32,
    "metadata": {},
    "outputs": [],
    "source": [
     "#most movies in the IMDB DB have an average rating of 6.4"
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "### 3. Most common genres\n"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 33,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "image/png":
"iVBORw0KGgoAAAANSUhEUgAAAYUAAAFQCAYAAABQ0GLUAAAAOXRFWHRTb2Z0d2FyZQBNYXRwbG90bGliIHZlcnNpb24zLjMuM
SwgaHR0cHM6Ly9tYXRwbG90bGliLm9yZy/d3fzzAAAACXBIWXMAAAsTAAALEwEAmpwYAAApa0lEQVR4nO3deZhcZZn+8e+dGEC
QnYDsYdMRRRaDojAq4I4LLggoDCojogOrj9wwB0XREUgogiubDYQDDDJppEtKEtA2cL9++M9dVJpujtF0nVOk
bo/11VX1zmnqt6nq7rrOeddZZuIiAiASW0HEBERgyNJIiakKEiFRS1KiIiIhakkJERNSSFCIiopakEBERtSSFmHCSbpT0kKT
VRuy/VJIlTVvM17ekjzRfRzdN2bPHElKQQ/XIDsHtnQ9JmwJObKKsgpQpUYzwduAba0vQKwLXAdsF0fynvSRL9mDJ4kheiX7wP/1rW9F/C97gdIWlHS96qz3JskfUz
SpOrYxpLOlnSPpDslnVDtP6d6+mWS7pO06yhu/Q3hbG/XFHm3XmMrxFv8l+ICfxuJbpZyTFw/g0EgcjYt0ho/3mpSjq2O
hu/sPtqp7pyeXd1lj5X0qckbSTpvOrxMyQt1fX4d0qaJenvkk6RtNaI19q3eq27JH1FksZ4jz8B/M72AbZnV7/nHbb/1xa/
56uoq7e7qd3p217EbJf2XpMur9+IESctUx14sabakD0u6DTha0iRJB0q6Ttv
TcCLwGuBZ4BTAZuBtYHDEyrHvc94GRgeWAa8Cdg7+rYccBHKScuywDbdb2+gY3HKf8PwCHjHF8FuAvYE3gS5YrmLmDV6vhZwCz
KVcWKwB+r2F5SPf57wNEj4jkFWAF4JvAgcCawYdfz96oeuwNwJ7AVsDTwJeCcEa/1c8pVzXrAHOAVY/wFvetwFvW8hnsRVwB/C86
nPYq/p8lu76rC4A1qrel6uBfatjLwYeAT5Xxfpk4P3V+7tOte8bwbrlSiH7qXC28FLgG+Gv
ngKTJwK7AQbbnupzRH0b5ogZ4mJJE1rL9gO1zH0e5qwK3jnN8J+DPPtr9v+xHbx1XxvabrMUfbvs72PcCvgOtsn2H7EeBHwJYjX
vNztu+1fRVwJXCa7eu7u7nt95/FuB5XNtjmx2pGwgnUAPseCvPtM+ozbwacwh6meyHCW6hWzs4jfDOdqpqkn4U7gG7bPtz3P9jG
UpLVN1+scafsW23+nfKl3l/cocL2CLDtDtB23/k/LF/1Hbs6v4PwkjNUb2AjY2p1kk0YRj2DwiUFsVjP8ls
KaufTcBa1f3PwQIuEDSVZLe8TjK/Ruw5jjH1wbuGHHvjNrYfqD6c9mu59/e9f3/jcWHbqGs+FEr64H9KsJAsV/YyrPV+ueM5RsJATYH5R8iRgtsLdd4Fq2cLjxFi7c8QrxWcB
```

/gSnV7vWBD1TJ4m5JdwPrVnH0Ut4c2w90ba8PnNT1WlcD84A1KJ/3qcDxkm6R9HlJU4gnlCSF6BvbN1EanF8F/GTE4TuZfzXQs
R7V1YTt22y/0/ZalLPTry6sx1GXM4DXd9onRnHLiHIXKLvPFii76g216iKWfSbwhoU85mbgUNsrdd2Wra6OejFyGuWbgVeOeL1
lbP/V9sO2D7G9KfAC4NUs2K4UTwBJCtFvewM72L6/e6ftecAM4FBJy0tan9JA/AMASbt0dau8i/LlNK/avp1SXz+Wwyn1+8dUr
4uktSUdXjWy/hJ4mqS3SHpS1Vi9KaUuv99+CLxd0haSlgY+DZxfVZ89Xp8A/rX6vdYGUOkG/Iyux3wT2FfS81QoTUxYvYvx
fp3xmnfd1qqTXVfe3l7RZVTV4LyXpzxv7pWIQJSlEX1X18jPHOPxe4H7geuBcyhfmd6pjWwPnS7qP0qP9Hzh3y3pz
aOU+XfKmerD1WvMpZxV3wPMsv03ylnsByhVMB8CXm37zsX9fRfG9pnAfwM/prR7bATSviv9SdK28A6lN5Yc4HfUa5G/rt6zEx
Ku8KXKcl1FqU6b1EdQfk8TqvK+wOlERvgqcCJlIRwNXA2VZKPJw7ZWWQnIiKKXClEREQtSSEiImpJChEhCERUUtSiIiIWpJChERUUtSiIiIWpJCRETUn
tCzHq622mqeNm1a22FERDyhXHTRrbfIXRXfanjrasSd0Upg2bRozZ47VBT4iIkYjaeQ0L7VUH0VERC1JISIiakkERFRS1KIiIhakkJ
ERNSSFCIiopakEBERtSSFiIioPaEHr/Vi2oG/WKzn3/jZnSYokoiIwZcrhYiIqCUpREREELUkhIiJqSQoREVFLUoiIiFqSQkRE1
JIUIiKilqQQERG1JIWIiKglKURERK1vSUHSupJ+K+lqSVdJ2r/av4qk0yyX9ufq5ctdzDpI0S9K1kl7er9giImJ0/bxSeAT4gO1
nANsA+0naFDgQQOONP2JsCZ1TbVsd2AZwKvAL4qaXIf44uIiBH6lhRs32r74mhRs32r74ur+XOBqYG3gdcAx1cAxAXau7r8OON72g7ZvAGYBz
+1XfBER8ViNtClImgZsBlwArGH7VigJA1i9OmZt4JaOp82u9o081l6S5kiaeNFfl4UNTx5CDCQW8N5RJNb0BoXt4iv5sRtcz1jf8Xaw5HfTZhrz+4XtWpANrk0c7
ssI+yPd329KlTp05UmBERQZ+TgqQFsgFIWl5XBIlRwrO2fVLtvl7RoTTGNbRDMqGv
y/g5K79u0laWtIGwCbABf2KLyIiHqufK69tC+wJuFDVoZS8fWvuH1FvDR4XRFPAdMk7Q
Vn7QVKvzNPmT8LEhIp0mn7FfUUtXekh0qaZ9wMP4Cyf4eEMPGbqcyK7ZNMaNPcJxDSIt8y9Ftrg
R2wkAdhzjOYcCh/YrpoiIGF9GNEdERC1JISIiakkERFRS1KIiIhakkJERNSSFCIiopakEBERtSSFiIioJSlERES
tn9NcRGXag
b9Y7Ne48bM7TUAkERHjy5VCRETUkhQiIqKWpBAREbUkhYiIqCUpRERELUkhIiJqSQoREVFLUoiIiFqSQkRE1JIUIiKilmkuhsj
iTreRqTYilny5UoiIiFqSQkRE1JIUIiKilqQQERG1JIWIiKglKURERC1JISIiakkKERFRS1KIiIhakkJERNSSFCIiopakEBERt
SSFiIioPa6kIGmSpBX6FUxERLRroUlB0CPWPtj/0CIiomm9XClsavteyeteYGfgl8B6wJ79DCwiItrRS1JYQtIiIwn2Siri2PgMUc8sPdkZs
cbPthwH2NKiIiWtFLUvgGcCOOwHHCOpPwPpPWBe/sZVEREtGOhScH2l2yvbXuWi2BSqJmIwF7yuVyStf02fXdSQ7r2EGSZ
km6VtLLF/k3ioioIRbbQNZolrQF8jQZo8H/j2Qp76XeDLwpdG7P+i7f83ooxNgd2AZwJrAWdIeprteT39nt4FvGKjEsbjrrEP
Wio7op16qj74LnEr5sgb4E/D+hN3J9jnA33QA1AF8bYftHDBHxo8dDMAt4bo/PjYiICdJLUljN9gzgUbjwCLcwb/HkmXV9VLK1f71
gZu7nrM7GpfREQ0qJekcL8L9Kval7HenHBrBhnEcv7GrARsVAVwK3BYtkHn5
HaSN476IUZvt22/NsPwp8k/lVRLOBdEsBdbseusZGkn6sfweHCiIiIMSy0odn2xZJeBDydckZ/bTVW4XGdTckZ/bTVW4XGTtKbtW6vN1
wOdnkmnAD+UdDil7WIT4IJFKSMiIhbdmE0yP0MPYQ3KHgoPY0BqBq0EXgXgO2rJM2gTKPz
xCLBfeh5FRDRvvCuFGFwF/AV4zyjYEDD4yYF27uPsnvMEd88aIyKiv8ZMRfYE87IKv3kCx8K+ZUOOOOkrSjpJsGyUU
RFLiF6SwtOBM4D9KAniy5K26L76mPvqn7Rm23wBsHRhl7mBsCawAwN8sB7B1PmX4o
lVS8T4t0AXArMAD5o+/5BxUREe3o5Uph8uGpgSTqrURf0Y0nrIr9D2yiIhoXC+oWXWT+/Vm1LyIi
jC9JIWpto+2/Uh1+y6QmegiIpZAvSSF0yMDF/A4uIiOb1htcUFLsDYvTuhaGNwzc9xp9vU2X8BXtWtalBERbJ
exilsQF1UZ1r3420nUURELGF6GafwU8qU1z+jWqc5IiKWTL0khqdhIHjQa5JtcWSCIonW9JIUjB0MnAY82Nlp++K+SB
uwJ7MD86iNX2xGxiBZ3Uj7IxHwx8XpJCq8HNrT9BuTvT9UL+DiYLu6G6oSEe3XpJCmsA10i6kKSN6XL7LmcdUnLNjR0iCdN
LUji471FERMRA6GVEc5bejIi+SqP74OhpOc6IiGGQ9pXeJsSLiIghMWZSkHRHMkKhRm9fNzzYUTERFtGq/6aE1JLwJeK+l4QN0HM6I5I
mLitd2+Ml5S+DhwILAOcPiIYxBGxBBBozKdg+EThR/b2/b/lSDMUVEREt66bFbqYZr0SGYp0WPm1wQj9PVVtG+bh9qISAV7JiidRLQ/Nxk
4Y3Xbv9oXERFLmF7GKewEbH7UQBJxwCAaZxzEwLIUAYxfM7CIiGher+MUVuVEUyuq6v2If4oiLiAHQy5XCZ4BLJP2jDjlOhexfVV6dRLQ/Nxk
s4CtqYkhQ/bvq3fgUVERPN6mvvI9q3AKAKX2OJSIiWpa5jyiopakEBERtXGtgqRJkq5sKpiIlVuhlLkbrsluRlvRNX6E4eoPOAmmG6a5v6mgY
6k4qkVSSdLunP1c+Vu44dmTAWUjphgGPOeghiwYWNGjA1wggGiJv7KQ1nRX8F75kYmrtMQG7Bnfcjg6MOXt6vdGfnkRrhRwkFxrS5
B5/h4iImCC99D46ZFFe2PY5kqaN2P064MN0P064MXV/WOAs4APV/uPt/0gcIOkwcBzgfMWpeyIg0FPa3RLGL9YBPb2Z0haaFljUs/g1qu6
t2L5V0urV/rWBP3Q9bna1vtbE4nbhfHhjvjBE4EvlHtWhvh6QTHoVH2eYx49pE0U9LMOXmTHAYERHDrZc2hf2AbYF7AWz/GVh93
GeM7XZJawJUJUP++o9s8G1u163DdTrALa09g02jbE+3PX3q1KmLGEZEROZeR4Iyml6Twow2O2HOhuSnsQZYZ/E9OAXYq7/7dJC0taQN
gE+CCRSwjIiIWUS8NzwdL/LbjeN4ZEkeZ4N4N/GxhT5bNBDRPP0HkVReTVJs4GDc8M0UtwMiBDtVuW0LW0bT02M/2vEX4fYSVIVEwYH0k
hQOBPYGrDeBfwS+NbmCnmR79E22XbEzOwsiE7OTjioI6JNeeh89WFMRvNRLjUHkTrBCnWhMT4HTzqlFv9w8CrDqbJBUTtBnwe14LtkK2ENpD0Ltu
/6ndwERHRrF6acwl/jp4Dtc9yvDSApHgCSFiIglTC+9j+7oJITK9czvShoREUuQMa8UJL2hzhunvVF8CMyhtCrsAFzYyFzYQW0RENGy86
qPXdN2/HXhRdX8OsPJjJHx4REU90YyYF229vMpCIiGhfL72PNgPtCzerfzt1/1YvIiIaEMvErbnvnCnybyMor50b5GExEReolKTx
g+8i+RxIREa3rJSkcIelg4FfUg4Dg2ew2xf3LaqIiGhFL6L0hT6Wa
BgAvVwprAFcI+lCfCmxTSJfUiIglTC9J4eC+RxEREQOhUlzHm9fZ5b3fN2Ax8qdM38zx7s2AJ18N5qMXCAvgGt4eT0/bjE8GG5FsLu/elrQ
z8Nx+BRQREe3ppffRAmz/lIxRiIhYIhCdavSeNB5jSr30h1lSaFN3yB7+AnMmmVXZm/ij4RjSS/RbErH3SjpeRUEq3ppU8i6ChERQ2K85Tg/P
s7zbPtTfYgnIiJaNN6Vwv2j7C0SmPvzkbOvHofgWHfznuCc3t9zqc2nSQWQ9u8g0vsY4gO0OjzR86ZDcbZFfjQ2fIs9ThSpSlW2INVRMbVdDUK7FoEaQOG1P7d1wBGwoS
FRETzxmtT+ALwBuAoYYDPb9zUWVUREtGK8wWfANYCPbcIune6jZX0r3NhBcREU0ar03hcY92joiLiAHQy5XCZ4BLJP2jDjlOhexfVV6dRLQ/NxkKE
RFRS1KIiIhakkJERNSSFCIiopakEBERtSSFiIioJSlERES tl5XXJpykG4G5wDzgedvTq8n3TgCmUVZ3e3e3Mm34uIaFabVwrb297
C9vRq+0DgTNubAGdUZjaAGdW2xER0aBBqj56HXi8Sv4l0L8qXSkTEcGorKRg4TdJFkvap1plAerkBc6RGJ6fbn1j58cStSmQo6IGAqNJwVJy1VrPiNpOeB1wJX
V3T6xOrJLIPwHrrrdev+CIihlrVwq2b6l3gGcBDwXuEO2kVVnuT3Gk6O5Rtq1fbnj516tSmQo6IGAqNJwVJy1VrPiNpOeBlwJX
AKcBe1cP2Ak5uL9xXBLGSBJkjrl/9D2ryVdCMyQtDfwFwF2CXFmKLiBhqjScF29/29Dm4ImLnhqS4jr1S19cDm4+y/2/b0kRPrFSEjIeVjbNgSIGIGhZk
kJERNSSFCIiopakEBERtSSFiIioJSlEREQtSSEiImpJChERUUtSiIiIWpJCRETUkhQiIqKWpBAREbUkhYiIqCUpRERELUkhIiJ
qSQoREVFLUoiIiFqSQkRE1JIUIiKilqQQERG1JIWIiKglKURERK1JIWIiKglKURERKtSSFiIioJSlEREQtSSEiImpJChERUUtSiIiIWpJCRETUkhQiIqKWpBAREbUkhYiIqCUpRERELUkhIiJqSQoREVEbuKQg6RWSpSrpU0S9K1kl7er9giImJ0/bxSeAT4gO1E
IioJSlEREQtSSEiImpJChERUUtSiIiIWpJCRETUkhQiIqKWpBAREbUkhYiIqCUpRERELUkhIiJqSQoREVEbuKQg6RWSpSrpU0S9K
BbccTETFMBiopSJoMfAV4JbApsLukTdNdNKiJieAxUUgCeC8yyb3th4D7h4XYZuDTi2+CwG5nl+SUTAUtb1KxeOtuFd9lidwUWFKXJaOO9DKUQCpKhuubBcTV36OHE
w+wT7X5dODaxSx2NeDOxGKaQxyNsTAICxCDDAYcSSG+QYhjkGIAQYjjomIYX3bU0c78KTFfOGJplH2LC1bB8FHDVhBUozbU+fqNd
7IscxCDEMShyJYbDiDiGIQYBiWOfsncwVHs4F1u7bXAWS5pKZIEYtREnhQmATSRtIWop4O6UtdaqYDWsGSQvxtRmX1geaUePXCsnXVNDIYTY3JfLPfrJz2DLmGxiSX06
HdsX9XnYiesKmoxDUIcgxDX+DADBEYiGWrWQZAWDYijKjwDVJCheRULaukUtsSiBgAkiZJ2AtJhPbcUQKkSKW5Sa+
WlL8DQNKTJT29jbjtPwq8Z6EPbICkyZL+s+04YjjrZRVE1B+GUjaRNKJkv6vFIl56fOpOreeEYhaw4Ejy5Iq4q8fmOiVSx3bwqfhHRqeQn1RG6ukdLtaTsTLJBv7hkaYXRSmqLtNDS
t4i6SOSPt65K8KMtsw5NMnlxNNBTuhTaH9hdHSRnRqRSmT/kuvSupJW6dwTaajhbi8iA6SWUVU7RNHW5W5ConqTnthDHTHEn7tfz/er6kH0lH6laTRBvl
OmKFMCsDRwNeAR4Dtge8B3+9rRE88xyNuu7Nwt4CTlD4H0qFyF6OcnCKxRoV9FkqQQJ5Vb1H28C4H81QTSl5ZqTOIOUR7L6ePeqnyMe2aTqVnZJR8VDzw8KyMTWfeZQJ3XUlJQRZB5OC4nwmsBVrNuTjmnzWaknLVT
RjeAewHnANcVN1mmNhxDx+8kfVnSv0raonProbwpwKnAWSVBM8yHdEEhwtUVM1Hzv12ZIqAnBg9BaJbbZEQGSvAHKSPP1xHnLtSMmYJaolcXVBr
SRbafI+kK25vXtr/P9Qlhf9j09H2LnSazA0MBaYnNbnLb9dU29OWKZVA6NMb9UcmkUwdFIhlOo/O0n82Phy7b8UA2uqv3MBaz/3Xy/v
7vNuNoi6bej7LbtHRqM4WLbW434TC6zvXlTMYyIZxLwasoJ5aPAd4AjbP+94Ti2B34AqyJev2BGrzWoAeqD/jP1WC
5vwKrNx2EbUu6DbiNcpa8MnCipOD2Npi6TjGCSPlKUNqJcLT3X9h2SlqMH74nBeD3kjazfUUDZYl3SklvASZL2gR4cq/Do3
vMDgPVs71PNDRPNTF8XTbP28yDgDb2zdd5igerqbTN4CkqZQv48ZJejbl/+RVwI+BY4HdgC+AkLO/kVYHDQDaA0JgkOM5XN11JmegSe9gC+BGwwYQ
VZnvobsDWwFMocysdDfwE2KbhNtCFmLtnwRc12AcxxAvHOPYYg3F3eYfigIlcgMt5cDVwCXN/4JL4Yjg3Fm8EzglgBmQuh6XGbpEDQc19FawmYQ
o7hBOBDwJXV9pOBS5uMoSuWfmSaWkH0DKdVXM4HDg9BUbjuGf1Rff7O4qzuRbYpYX3iLgTOAtwNIjjv2koRj+BPw3sMoxz48kWUNZfX
RIJD0SUpV0U2jHHuG7asbiGEycKrtl/S7rIXEsf5o+0d7b/pU/qC8DzNtTx+E6hJJPwaupJw0QDlD3dz2GxqO4yrbmzVZ5hhBL/OrIbgU3kWpbyPNIw1HRmS0Jh8g/A3C
+NbIXYR+NQkSSVkRaHKDrbRFDXkaBCMvBlIXgrHRs6Y2Z8bSnx4JLCgJS6H4JMaN38w4PjznsfEuEEm0lKtWyQ1PhrSHGXxf8Lg/NWNWwwY0gpHyK2qG6sl4fJ+8J2GGUZ/LPY/e/GXi2JumWj/Mx7LPjIkbSD0l+6jL8SrpNM1gAN6uO8lPc0TNL5y8BS3LxMw5IMw1+MQHZEHpspMbYMt0PpsxxI0W/tc3nsQMYUu7C4YUuKAQA0hRm2cfr+9yXELNXYFtNIzAODSNv8v5M4ZgKcZVw1egtmjGu4Nbi5zjLBuxRG0F/7U0mBgHt3zmODbYKoZ/g7xbsFVo5+tkWYPWN4k7txzBWArwRDsm6L8eDNBoRuoEU3FVqpyhYUO8RhYP2U0wgVqdDBGUgXB0HLYVRiNs76EDaOlGPkqNbUuXXu2lqbkXKZ+JWoWK2UkZd+0HKc6LuN8PbTXaeNHtxFhXMgzovoCwXtwbnHXMoghLkJz7jtFB
SRbafI+kK25tV+/7P9r82HIeAlwFvB6YDM4Bv276vB4y49urUbHfyu5TiqWHFYD9gDeD1wNbAwcaftLDZR9pe1n9buchcRwvu3nSbrE9pbVvstttGFHGGXExlLcrTfxpv72EH
ZmKGB3ZCRJmd4s8ckDrcB4Bf4CKiOt2Vkv53gKUdlZJjBTbh6ahMhnG8jucLbbrrL1DXhBnHu3nXbLx+Tl7ENFKwNfqHtPJQ3N9p51LPj4g6dlYh
vMDgPVs71PF8XTbP28yDgDb2zdd5igerqbTN4CkqZQv48ZJejbl/+RVwI+BY4HtgN8AWzQzRQ/qqUk7Y9gduB91Jme9gC+BGwwYQ
VZnvobsDWwFMocysdDfwE2KbhGN5HqR44FdgFmFmLtnwRc12AcxwAvHOPYjg3F8EfgIcqMt5cDVwCXN/x5LAscSplq5ULgf4BlG
o7hBOBDwJXV9pOBS5uMoSuWfmSaWkH0DKdVXM4HDgBUbjuGt1Rff7OqzuRbYpYX34iLgTOAtwNIjjv2koRj+BPw3sM4oxz48kWUNZfX
RIJD0SUpV0U2jHHuG7asbiGEycKrtl/S7rIXEsf5o+0d7b/pU/qC8DzNtTx+E6hJJPwaupJw0QDlD3dz2GxqO41+AHSkzKJ/Zx

P/FKDFsaLvRjiijxCBXX9ZVLcdTbN/bj7KGsvpI0nTgo8D6dL0HbqD+uKs3yf+O2O7E8Pem/vBtz5P0D0kr2r6niTLHiOMmSZs
DnTad/7N9WYPlD8T7ADwk6cnMry7ZCHiwpVg2sv3Gru1DJF3aZACStgGusv2Vant5Sc+zfX5D5R/Qdf8xx20f3kQclWMl7QvMo
1y5rCjpcNtfmOiChjIpUOoDP0ippmi6jvIiyj+9gPWAu6r7KwF/YSLrBnvzAHCFpNPp6vFj+31NBSBpf+CdlGo8gB9IOsoNNHJ
3af19AA6mdIldV9KxwLbA2xosv9s/JW1n+1wASdsC/2w4hq8B3T2e7h9lXz812QNvYTa1fa+ktwK/BD5M+S5JUpggc2y3MiW37
Q0AJH0dOMX2L6vtVwJtVF/8orq1aW/KCnv3A0j6HHAezTRyd7T+Ptg+XdLFwDaUE4X9bbe1yte+wPckrVht3wXs1XAMdZUJlAF
+khr7zrJ9SFNl9WCKpCnAzsCXbT8sqS91/8OaFA6W9C1K41F9eW77J2M/ZcJtbXvfrrJ/JelTDZbfKfeYhT+q70S5LO6Yx+ir8
PVNm+/DKP3/b61+ridpPdsXNxzPZGAP25tLWgGgX/XXC3G9pPdRrg4A3g00Vrcv6UO2Py/pS4xYARIav4r8BnAjpQvqOVU7XNo
UJtDbgX8BpjC/+sjMr75owp2SPkbpb2xKd7O/NVg+UEZ3A58BNgWW6ey3vWGDYRxNGbF5UrW9M/DtBstH0g2M/o/fxPtw2DjHD
DQ2NgDqNpbnVPfbSAYd+wJHAh+jvA9nMn999iZ02vbaGkBYs30k5b3ouKkarzDhhrL3UfegtRZjWIVSh/xCyh/8OcAn3fxAmHO
rOL4IvIaSMGX74Ibj2IrS71vAObYvabj8Vbs2l6F0E17FdqPTbQwKSYcBm1D6wHe3sTR54hRdJO0EPJMFT94+OeHlDGlS+CbwR
dt/HIBYnmL7vhbLb210t6QVqsazUef3aTpBjiTpXNvbNVDOuN082/gilnT06KH4HQ3GMJXSAWEaC/YSbCyGKo7Weit2xfB1yli
a7YFvAW8CLrC990SXNazVR9sBe1VVBg9Szk7d8If8AsqH+xRK3fHmwLtsv7upGCptju7+IWXagE6PrA5V241VYY2o159EmXakq
d4nrxnnWNPVmp02hTttf7DJckdxMvB/wBks2ObUtDZ7K3a8wPazq6lXDqmu5PrydzGsSeEVbQdAqa55OWXEJrYvk/TCFuJ4P+U
M5H3ApyhnIv/WRMG2X139bLob7mi66/UfAW4AGlnfwPbbmyinV1WbQtOT341mWdsfbjsIWuyt2KXTHfgfktaitD/25f9mKJNCZ
6SspNXpqp9rIY6bRwyKaeNsaJrtC4H7KO0JSNoFaGSAUFXembZ3XNi+Ptt75KhVSY0kK0l72P5B92Cpbg0Pkuq4VGXq8DbbFH4
u6VWdbtstGoTeij+XtBJlXMLFlCvIb/WjoKFMCtUkcIdRpsO9g1JXeDWlEacpN1dVSJa0FOVMvfEh/MBBlH/8he2bcJKWoVylr
KYyV30nQ65A+WyadCKPHRR1IvCcBspervo5SIOlVqGcjXb3fGq6Kmt/4COSHgQeZn417woNxgCD0Vvx87YfBH4s6eeUk9kH+lH
QUCYFSjXJNsAZtresunbtvpDnTLR9gSOAtSkTfp1GmUu/EdVguVcBa0vq7uq2AqX6pAnvolRfrUVpV+gkhXtpaN78am6dZ1KmD
ehu8F2Bhq4ibX+jqse/1/YXmyhzYQahSsv2oCTJzdvurUgZzLkVQJUcHqwGOk54Nd+wJoWHbf9NZV3cSbZ/W42ibUw1UvWtTZY
5wi2U/tevpXwhd8wFGlmK0fYRwBGS3tvwlBbdnk5p7F6JBRt851J6vjSiqsd/LaWtqXWS1qGMKN+WclZ8LmWE9eyG41iZ0jW2u
xvmOU3GAPxB0qZt9FaU9FTKieOTJW3JglfTy/alzCHtknoGZYDUZ4DVKFVIW9t+QYMxbECZE30aC3Zze21TMVRxTLH9cJNljhL
DfsCxtu+utlcGdrf91QZjeL4ncKGSRYzhUMqU1SewYD1+oyOaq1hOp/QO66xIuAfwVtsvbTCGf6dUIa1DWSp1G+A8N7jQTxXH1
ZT1RhrvrShpL8r8V9NZcBDdXOC7/WjXGNaksBylNX8S5Wx9RcqXUmMjiiVdRhm1u0A3N9tnNxVDFce2lKUoO32wO3/wTXYHvdT
2FiP2XeJq+uiGYmi9T7wGYLWzrlhG+0wes6/PMVxBWfvkD7a3qKr6DrG9a1MxVHG0OrV7FcMbbf+4ibKGrvqoqrs92WXu/EeZP
1980x6ohq637duU6qKLaK8v+CRpgfniJwNLNRxD633iPRirnXXcKWkP4Lhqe3ean4blAdsPSELS0ravkfT0hmMYlN6KP1dZGXA
aC560TPiI5qFLCh6cufOPkHQwpYG5u5tb01UF99j+VcNljnQqMKMatWlKI3zTMbXeJ17S0sAbaeAfvwfvAL5MaeMwZWnSRkcSA
7Orbpg/BU6XdBelLaxRA9Jb8WTgHsrJW1/X2BjW6qMZlPrJNtcQ+AxlNavr6Orm1kJ96WeByZTuda0kp2pE9T6UqcMFXAKsabv
J3lj/A/y+zT7xkn7N/H/8+mrF9ngT5g0FSS+iVPP+2vZDDZd9GaVr7gK9FW03NjmfpCttP6uJsobuSqHS+tz5wOuBDZv+Ax/F8
6qf07v2NTozp8s8+X+gTGuxK6WPfCP1p106feIfoqwX3Uaf+HVstzraXmNME93R5IkT1J0O1qU0rM4FnkUZvNWk1nsrAr+XtJn
tK/pd0FAmBdvHVA2L2J7TUhiXUbpB3tFS+UC79diSngbsxvz66hPaimlA+sQ39o8/ju4eLodQZtBthcr6Im+jrKHQPWis6Yb3u
yU9hTKT8bGS7qC5sTwd2wFva2K+tqGqPlKZU+Jg4D2UN3US5cP9UtP1tpLOAp4NXMiC1TZNd0ldA/g0sJbtV0raFHi+7b6vZyD
pUUrj7t62Z1X7rm+y51NXLKL0RNvA9qckrUupwrqggbKvpHzpPYnSJ/96WpqocURcjfYAG6X8a4HN2rqaVlng6C8D0luxsR5Qw
3al8H7KYJytbd8AIGlD4GuS/rPh0aStnYGN8F3KIjcfrbb/RDljb2KRmzdSrhR+W9WnH0/DK651+Srli3kHyoj3+yijqrduoOy
1gS0aKOfxavuM8UravZr+KbCV7fsl/dj2G2mpt2KTPaCGLSn8G/BSd617a/v6quvdaTQ4mtT22dVZeudL5wLbbfzxr2Z7hqSDq
rgekdRIl0zbJwEnVWdiO1O6xq4h6WvASbZPayKOyvNsbyXpkiq2u6o5qZpwQ5N93p9APgNcUl1JtXE13X2C0vjVa7cme0ANW1K
Y4lEWQrc9R2VR7MZIejNlxsOzKH98X5L0QdsnNhkHcL/KqmOdMQLbUHrANMb2/ZQ5649VWXBnF+BASqJuysPV+IjO+zCV5ubOX
11jzJAKzc6SKmku868QlpXUWY6zjYb3Y4DP0d46Bh7jfhsam69t2JLCeHWTTddbfpRSjXUH1F9CZ1Bm5mzSAZQ1HTaS9DtgKmV
Vp1a4rLb2jerWpCOBkyhf0IdS3oOPNVT2ZMpiS21VndUGpMG9486WB3huXiVFUeYeajNBNtYDatgamufRNS6h+xCwjO3GrhY0Y
p3oqq/+ZW5hNkZJT6JMDCfg2rbnQmpLNY3CjpT34UzbjUxlLuli24OwqM1AkXQ4pdroFNod4Nk6NThf21AlhUEi6QuU3kedaQR
2BS5velRtVWWyE48dRdvGwi6tkXQEcILt37dQdqu9fAbVIM0F1ZY2ekAlKTRM0sbAGrZ/pzJ//3aUM9O7KB/ydQ3H80vKYh0jJ
+Y7pMk42qYyG+WuwNMo1Ugn2J45/rMmrOxVqmqziAV0X0V29YDqb5lJCs1SWTXpI7YvH7F/OnCw7fEWce9HPJe31Q9+EFUN3Z2
usuvZ3qTlkIaWpBUpXbc7a5efDXyy5TnLGtV9FdnUFeWkfhcQjzFtZEIAqM5KpzUfDr+S9LIWyh1UG1OWXpwGXNNuKEPvO5SpL
d5c3e6ljKkZJo33gMqVQsMkzbK98eM91sd4Xg/8gHKC0OY6uK2qenK8gTJB4QzgJ64W/Yl2aADWdGhbV+cYAU8G/tE5RJ/+T4e
tS+oguFDSO21/s3unpL1ZcFnMphwGPB+4wsN9hnADZXqPx4xjidb8U9J2ts+FekGof7YcU6NsT266zFwpNKwaxXwSZVxEJwlMp
ywq83rbtzUcz6nAK223MTiodZLG7Qo6jN0fB4WkLSgD2FaknBn/HdhrtOrXmDhJCi2pRiR25ke/yvZvWorju5Qh/L9iwb7gQ9E
ltavb4zKU5HwZ5Qvo2cD5trdrK7YoJHWqSP4B7Gr72DbjWdKl+qgltn8LjNYPu2k3VLelaH4JzNZ1pumWdDywT2faaknPAv6rz
diGVZUE9qNMFHgyZaT/fpTP4zLKlCjRJ7lSiCCNmoNE0smUcTvnUUaYr0w5Ydnf9qUthjYUkhSGXFV98pg/gmEaNQog6ThKL48
fUN6PPYDlbL+l1cCGUPcUMNWI+zspY0bmthvZcEj1UXRXkSxDGbjV9KpSg+DtwH8A76O0KVxMO+NGonSNBsD2PEk3JCE0J0lhy
Nke2Q32d5LObiWYFtl+oLpqWpMy3cXKND9jbRSd2UlhwRlKh3IMTdOSFIZcNa1DxyTgOcBTWwqnceOsE/3iFsMaam30zY/5khT
iIkoduijVRjcAe7caUbOuoawT/RrPXyf6P9sNKaI9SQpDzvYGbcfQskFaJzqidZkQb8hJ2k/SSl3bK0t6d4shNcr2SbZ3pUyCd
xZd60RnosAYRumSOuTG6J8/1Iu+dK0Tveuwdc2NSFIYcpIuBzbvTIZX9Qu/3PYz240sItqQNoU4FZgh6euUBud9gV+3G1JEtCV
XCkNO0iTgXcxfsP404Fu257UaWES0IkkhkLQU8HTKlcK1th9eyFMiYgmVpDDkJL2YMmf9jZQrhXUpc9af015UEdGWJIUhJ+ki4
C22r622nwYcZ/s57UYWEW3IOIWY0kkIALb/BExpMZ6IaFF6H8VMSd8Gvl9tv5V21oqOiAGQ6qMhJ2lpyqpW21HaFM4Bvmr7wXG
fGBFLpCSFQNJUANtz2o4lItqVNoUhpeITku6kzBR6raQ5kj7edmwR0Z4kheH1fmBbYGvbq9peBXgesG2mjo4YXqk+GlKSLgFea
vvOEfunAqcN84R4EcMsVwrDa8rIhAB1u0K6pEYMqSSF4fXQIh6LiCVYqo+GlKR5wP2jHQKWsZ2rhYghlKQQERG1VB9FREQtSSE
iImpJChELIWkNST+UdL2kiySdJ+n1bccV0Q9JChHjkCTgp8A5tjesphTfDVhnAl578uK+RsRES1KIGN8OwEO2v97ZYfsm21+SN
FnSFyRdKOlySe+CsnCRpLMknSjpGknHVskFSTdK+rikc4FdJL2suvK4WNKPJD2lnV8zokhSiBjfM4GLxzi2N3CP7a2BrYF3Stq
gOrYlZSqRTYENKVOKdDxgezvgDOBjwEtsbwXMBA6Y8N8g4nHIegoRj4Okr1CmGX8IuAl4tqQ3VYdXBDapjl1ge3b1nEuBacC51
eNOqH5uQ0kav6suJJYCzuv7LxExjiSFiPFdBbyxs2F7P0mrUc7q/wK81/ap3U+o1r3uXo9iHgv+r3UGDQo43fbuEx92xKJJ9VH
E+H4DLCPpP7r2LVv9PBX4D0lToKxvLWm5x/Haf6DMSrtx9fxlqzWyI1qTK4WIcdi2pJ2BL0r6EDCHcqb/YeBHlGqhi6uG5DnAz
o/jtedIehtwXLUCHpQ2hj9NVPwRj1emuYiIiFqqjyIiopakEBERtSSFiIioJSlEREQtSSEiImpJCRETU/j+
FUKboCMmWmgAAAABJRU5ErkJggg==",
      "text/plain": [
       "<Figure size 432x288 with 1 Axes>"
      ]
     },
     "metadata": {
      "needs_background": "light"
     },

```
      "output_type": "display_data"
     }
    ],
    "source": [
     "#split the genres column and make it into separate rows\n",
     "df_genres = joined_movie_df['genres'].str.split(',',
expand=True).stack().reset_index(level=1, drop=True)\n",
     "df_genres.name = 'genre'\n",
     "genre_counts = df_genres.value_counts()\n",
     "\n",
     "\n",
     "# check how many counts there are \n",
     "len(genre_counts) #there are 26 genre counts\n",
     "\n",
     "#plot the bar of the most common genres\n",
     "genre_counts.head(10).plot(kind='bar')\n",
     "plt.title('Most Common Genres')\n",
     "plt.xlabel('Genre')\n",
     "plt.ylabel('Number of movies')\n",
     "plt.show()"
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "### 4. What is the average rating based per each genre?"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 34,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "image/png":
"iVBORw0KGgoAAAANSUhEUgAAAscAAAG9CAYAAAD5p9sUAAAAOXRFWHRTb2Z0d2FyZQBNYXRwbG90bGliIHZlcnNpb24zLjMuM
SwgaHR0cHM6Ly9tYXRwbG90bGliLm9yZy/d3fzzAAAACXBIWXMAAAsTAAALEwEAmpwYAABGS0lEQVR4nO3dd5xtZXX/8c+Xi0h
RsIAmSrWLBQtWiDFqbKixRcVeIhorGltSedYoslUbEQoqgoasSG2FBRRC8CdhODBSMqqAiiUtfvj+c53HOHmXvn3tn7zJ3h8
3695jVzzpnZa5+ZOWev/ez1rCdVhSRJkiTYarl3QJIkSdpSmBxLkiRJncmxJEmSvFkdSxUe6hilVpUbEQoqgoasSG2FBRRC8CdhODBSMqqAiiUtfvj+c53HOHmXvn3tn7zJ3h8
3695jVzzpnZa5+ZOWev/ez1rCdVhSRJkiTYarl3QJIkSdpSmBxLkiRJncmxJEmS1JkcS5IkSZ3JsSRJktSZHEuSJEmdybEkrVB
J/iTJ90ba9rFJ/mqMbUvUslszkWNIWrSdpv05y+eXel6VK8sIkFyT5bZKzknwpye024ecrytz6XUm9vqC1V1/XH2djhJtknyj0m+l
+TcJP+X5ONJ7rrc+yZJc5kcS9piJjdkT+BOggPuMsP2th97mIhxRVVcAdgY+C7xvGFh1o4E/gJ4ABQwdapr+ppFX
E5FjSluyRwJeB/wAeBZDk8n3U9caTb0qySSWnvVSOm+DpybbZOskz0vyyn0vyyN0OSfLtJPeb+v41Sa6dV1F3Zr+ppFX
MwkP0jylD6Cu3V/fKcKb0tyeh8RfWmSNRt7YlV1IXA4cM0ku/Rt3X/T0/OAkd0zykznP7VlJvp7
kN0mOSLLt1OPP6dv9a0L2/mjjsSPY46OHklylb+ejSZ46/Y095/n3nbiDJXYA/B/6iqk6oqvPaP/n
p829dgLk7w3yX/2v9G3kOVP+ZZe9G3k/cTl5/OHC3JFevqvIk6oVxh+x0v6uoSFZ+WS2FZm/SbFAmpBjnjZJW//L52cObCLdDb1Blx0Kr7C7XstK+ACXFX7Zw/zEaRZYxMkvHX0yDX9cs5/Kc4PcTpjtcHUpt2zq5mUP
p829dgLk7w3yX/2v9G3kuw753nP/Zvetv/tz0pySpI7buxvIklgcixpy/ZIWgJ5OHC3JFevqvOADwAHTn3fg4DPPVdUvktwCeDv
wBOCqwJuBo+aUZxIG7W8Uk9S/5c2Qr0T8CLgnUn+4F44F7ADcd84X0wQ0V1V4X4jxcu0tbLRDv7t5beaaxuo96WmUtIJM2xtX8QJ
EaVbwfcGXgSQFXdoX/PPdeGbF6x2b9JX8edbSk/eSXDxI8CPPN3WtvEAXVVlCLmB7PlsRMhmuk5b8HOg3Esgj1/3ui4Bn0
FOKGqfjLLPY5Of3wr4MHBK386dgbYOT3G1/8dgYOT3G1/zjPPClb21dgYN3hz+4Dv8LvAu4/DLbM
qQlsA/tD7+L9ZPjh/b7oCWzb+6jlBdV1WHAecBtp77dAH4/uNNPDmbnhAu8JoXXjsn1sv5SuHwvahPMn9m8Ts1CbSVGgCdgEwyqn1ctu67AWaIJaZK
cD66qc6vqF8BrgIds4KK9kK9w6KE1MKjk2kcKL9rLXnBmecu/i14m1jcBWjeT9Ynnz0LTmMZPDgOt8XE8vUb+dg8Ihj1n7/8/5BWsGfswdYCoIJT
s4F/qHv+xrgQ8B1k1y3f98jaOUi58+zjZ2BnR6lA+hUCDsPv6p7XJJV4fW6p9RlPbn9NQxi3mvAL8r+sWaXdXYPsmmH8+PjXsf3Xbmfzp+pWU6nr
48LH+/RdX1SeBtcA9F/GcJV3GmCjmqs7st9V7wP4DLBdktsk2zf6KtPv4e4CJSn5e4VdY2NJPhdJ0QQMBwNxV09lVcnrmOTUDYQDNtwk
GcBN6YldfSfO22Bn90DuBxw+tTPvhm42ae13ur6kqh00c1ArJSlx2Ltr7zHAn9XajyJ5Vw2zBKa+PAmNj5xBFa9XdNYVpe1Lz
OffT+vcDD+6jvgbSEdT6/BCaj8FTVr/rzvyUwGc3fA7jGnL/Gk4UnZEg1Dp9n+nh/rRaYmYAJBgjEbb9eS4tJRk5H2nwJKL3RmUaBtHQZbE5jqN
UkmSdHlgSsl2aeqTknyXlpS9nPgICIP1V1Tv++04CXVdLNhCipmLtQRulvDNwfFVdlORKP1bTgd2nfrZ3PR3sar
qzCRPAL6a5F1Vd2TrwRuAk4MCqOifJwcVw6y6wmsjSaenOjBc6GjLP5Hz6atmv3cGasAqtGVpHhCmP1xGRKTHjDUq8S6I6Q1HJEP9v6eb
cWoqa9Po416P34J25N0GeXIsaQt0X1p9bd700aFbwbcEPgCrQ4W2kjyg4GHsa6kAlqi+8QpwkOyQ5IMkVF4i1Ay2xOgMgyWN
oI8cT7wWenuSaSa4EPHFyeQyQE9ojwFelWTHXRiuUXsuxAz3+l3XRE4G/htkhshAfz3nR34OXGsx257He4HhJLlhku+0G8MvZzsQ3u2wmVxDGnMgSZuBf
1zEzzw8yd79+18MHNnLLLCrJ8N8MAq1h4iJlgw0obTLbaWM2Xef0PN6beDOhhHQyjg2/n6+PVhqdvVNR1a5NFnkDWpXT1m+u3YVfTCBhBp9wIcFl2JSkzkwvrsEoCGXGaoQTLcdoNMZ
1zEzzw8yd79+18MHNnLGujJ8MXAq1h41JiqOobWleO/+t9kmySXY/0yl68AZ/dJddulTYK8cZJbbdYzhXcC905yt76tbdMmL6CyhG6
60Z+UdJlncixpS/QoWn3n3oFP1SMMV9OWg5f9H4k5ZU0/sgdTl5kpbIx7QSv0gwhR1fedPTKQn5YBmDypYcJn6nrfTUpAQ91aSBNA
cBfp43qfow2Oe2i/vgjgW2Ab/d4R7Jpl+9fARyU1mnjWbT66XN63LmT7l4IHNZLBR60TT40qzm/vePhYbxKBZDpH4v4WqfGsbeZRVPtKrmMR0BACN5y/DosCn4+4E7k0
Iz4BtgafNefw/ab+vd24k/P2By4Ck4Hb/TvOwv4Ae2k5u593y4C7k07CfohCYZsSXxFBDZXT4SgNqBzQr7XGFY
YAk9wDeVFV7LPe+LEWSNG9Jqni+/4J5hGUsKFqSNqBf5r9n7TeAFrJv8t6IkuV8va7gy8M/Ah5eQGG9
PazN3yJD7KEnLzeRYkjYstLZnv6aVvXyWWtcSnibLAjvlRhlBc1Skm6p4ijY5SsUkKZRwSJRJr8KU24z1BR2c1JkcS
5IkSd0WtjIzjvvXHvuuedy74YkSZJWsRNPkdimtQjIzjvmk6mSJSkrJVJWsRNPbjSZikbVoZmzWJEmSOpM0lFvSPzcm
WJEmSOpNjSZIkqTM5liRJkjqTY0mSJKkzOZYkSZI6k2NJkiSpMzmWJEmSOpNjSZIkqTM5liRJkjqTY0mSJKkzOZYkSZI6k2NJkiSpMzmWJEmSOpNjSZIkqTM5liRJkjqTY0mSJKkzOZYkSZI6k2NJkiSpMzmWJEmSOpNjSZIkqTM5liRJkjqTY0mSJKkzOZYkSZI6k2NJkiSpMzmWJEmSOpNjSZIkqTM5liRJkjqTY0mSJKk6rZd7B
xZjz+d9dJN/5ocP2CEPZEkSdSdJq5sixJEmS1JkcS5IkSZ3JsSRJktSZHEuSJEmdybEkrVBJ/iTJ90ba9rFJ/mqMbUvUslszkWNIWrSdpv05y+eXel6VK8sIkFyT5bZKzknwpye024ecrytz6XUm9vqC1V1/XH2djhJtknyj0m+l
```

JsSRJktSZHEuSJEmdybEkSZLUmRxLkiRJncmxJEmS1JkcS5IkSZ3JsSRJktSZHEuSJEmdybEkSZLUmRxLkiRJncmxJEmS1JkcS
5IkSZ3JsSRJktSZHEuSJEmdybEkSZLUmRxLkiRJ3ajJcZJnJPlWkm8meXeSbceMJ0mSJC3FaMlxkmsCTwP2raobA2uAh4wVT5I
kSVqqscsqtga2S7I1sD3w05HjSZIkSZtttOS4qv4PeCXwY+B04DdVdcxY8SRJkqSlGrOs4srAXwB7AdcAdkjy8Hm+76Aka5OsP
eOMM8baHUmSJGjxiyruAvwg6o6o6ouAD4A3H7uN1XVIVW1b1Xtu8suu4xWnkiRJSzJ/xi4bZLtkwS4M/CdEeNJkiRJSzJ
mzfEJwJHA14Bv9FiHjBVPPkiRJWqqtx9x4Vb0AeMGYMSRJkqShuEKeJEmS1JkcS5IkSZ3JsSRJktSZHEuSJEmdybEkSZLUmRxLk
iRJncmxJEmS1JkcS5IkSZ3JsSRJktSZHEuSJEmdybEkSZLUmRxLkiRJncmxJEmS1JkcS5IkSZ3JsSRJktSZHEuSJEmdybEkSZL
Ubb3cO7Al2fN5H93kn/nhyw8YYU8kSZK0HBw5liRJkjpHjpfBpo5QOzotSZI0G44cS5IkSZ3JsSRJktSZHEuSJEmdybEkSZLUm
RxLkiRJncmxJEmS1JkcS5IkSZ3JsSRJktSZHEuSJEmdybEkSZLUmRxLkiRJncmxJEmS1JkcS5IkSZ3JsSRJktSZHEuSJEnd1su
9AxrHns/76Cb/zA9ffsAIeyJJkrRyOHIsSZIkdSbHkiRJUmdyLEmSJHUmx5IkSVJncixJkiR1JseSJElSZys3LYkt4yRJ0mpic
qwVwSRckiTNgmUVkiRJUmdyLEmSJHWWVUhTNrV8w9INSZ
JkqTOsgpJS2L5hiRpNTE5lrQi2QqOZPkjQLJseS1DlZUpJkcixJq5RJuCRtJa0RETSrJgcS
5LUmYRLsqxCkiRJ6hw5liRpxrbUtoGOgksjJ8dJrgS8FbgBUMCjq+qLY8aUJEn5mWsMWebPNtR4Zc32FPJ2CI409cvxa4OiqemCSbYDtZK
02UzCNVpynGRH4A7A7AowGq6nzg/LHiSZIkSUs15oSSawFnAIcmuTb1ZdlDIejRt2JjJ8dbALYA3V
tXNgXOB5839pqo6Kr2rap9dtlllxF3R5IkSdqwMZPjtcDaqvpS//+RwE1HjCdJkiRtltHKKqrq9CQ/SXLdqjoNuDPw7bHiSZI0C5+/F3C36+Eq+V8MHA5S28H0D94t8yDNX9iJP5JP6nsGkB0vUR+F5yq0sb0BygLWMzGB0aUdgzpMS2+a30U2a4FMZA7VLAO+EbF9
qZJZkEGyOpkkyqZdqJdIo/iUIyBfOmRsjwGgyHvqvCsqGxz3X9cDQi8qyR8T5RfR+wH1DIyvPJFc4eTv79JYXJ8aXfLD+9g9ajGKfgvtEJxcyZ1+i3E+bkXvs3jx
8DSDp6KLMJX+qTXqCTKrZOtd6kWZcjyzLRLRRjuLD6J7hnmbm3J2Od+NVUjfQLTaRKPtsKJrtcJkHdH9z7q58aL+PZ1KFVpqBi7vuAlLdqyQAcEyhTOUGNHZHPtKmqCxH/RrOF+xOrN2xYIZ3ujUuWTjxrGpZ6qKPJAJBG3BhrhQ1CXYCZ8qgJuiYV3kC
9ZWMFr9s1MU3jR8pk4EDJYzHb/xbsS/6ZXwgkBF+1AfCXbqsgWsk4ftmhCDRkhIzxJf2NV/6cRvxk1JnMR5MK4jM3mBgpyvA56I1+q88RYAERBbc7G+TuGKOGjjmVFWZpKr8VrSnlNgRymhW+aZXXSZzWhjMEzLR+l+b5nG0FjBP
4LnG1pMuyaF+2jH1iLHhFWtpuPRmCaYqjMNYTcLrWPQ7j4R8Vx8Nie2HUV2/Q96wp7dnk9hNS2rFDyeB+q+nNHsvdJmDyjvrw0+eYy8Hy9kJBx9Lu5K67Rc3wpt1M4Ge8LmLX1R8B+ZJhaLpLyIRhVqnNVJgs/h2iwXCHpQvA4qVvF0dWk4hyXm1ZCNYTkqr5MK56nwYPn3LFPF4uZuZnM0ZbG3JVYmWtyXb9VmKbBv/n5s0aK6Yk0YWuSqD2o9h8tj07mNKh1NT4ezHxwzaQPMyXnOsBDPMWhbdmiGP0IXIbTi28HSqTq0YMh4XJMDHYlRwcuyfsB1ttlgFRvRaV7MprRXjtPm/mr9iM5iCgdHmrMQqAfgKSCxcQQ4OuYrswunvjkeS0RwsbCptAz/l9QK4f9/bD2vVm8xN6lzUUzbIb3bKGFK9eIxzkI1Z+CrTuzk4gZ2cPzULT62Ov/aG4X9y4wR2tgC16YjgY4J2n4Y63hTYc0yekTQj5/HQ7x1Ox9WpqrGg3hFBcQx9iF4ugwZKNRGgq4RCbjzhOPhJu+AEdMVIdwERlr0wAh8+1+fxm+KP0x8T7NjyQ0a6tJaJA9LFN9mLQtKFA==

/CmqrrBUrY/MWqf44H9lPZivg/tDztxDjDK8H1VnZ3k/cB2tIP+/YBnJ3ldVb1+qdtP8lbaiNTPaaPGD6SNhIzhgiQHAo+iHeQ
BLjd0kKqqJD8DfgZcCFwZODLJJ6vqOQOFuTjJ7lX1Y4Ake7CBEbjNdPv+efqMumgJxmCq6mzgMOCwJFel/Q+8vr9J7rbhn96kO
AV8Evhkkj+jvbE8KckpwPOq6vglhtgGuALtPWX65O5s2nMa0mm0N/hZ2K6qPp0kVfUj4IVJvkBLmJdkyOR3ES6sqt+0fHJcM/h
fuyTODN5rJrFGOxZU1V4D7OJiY30f+Ls+Wn0v2qj7xUneDrx2oMRslq/PC5Ksob//J9mFdaPVg6mq0+a8doa8wvf3wAf6158Cx
iyl2LWq7j7i9qeNdQy9G/BoYFfg1VP3nwM8f4nbvsSKSY6r6pQk3wTuWlWHjR0vyX1oZ9jXBt4B3LqqfpFke+A7wJKTY+CqtNU
DzwJ+BZxZVRcOsN35PAZ4IvCyqvpBkr1oB63BJHkaLfk+k3YZ6tlVdUFavd7/AEMdsP4OOC7JJLm4A3DQQNsGoKr+bMjtbUy/H
Hh/2ojOVWiXcIfc/lWBhwOPoJ2MPZVWWnMz4H3Akg7QVfW5Psp6k6p60dL2dqNOBY5N8lHgvKl9ePXCP7LZ/jD5/01b8fP/gKs
NGWDM0o0p30zyUGBNj/c04EsDbv8SY/+v9Rizeq8Z/VjQt/NMYPd+ef26tJK3jyxx1xeKd1Pa87kn7X3mcFp532dof6OlmuXr8
3XAB4Gr9ZHKB9KSzSGd1ksrKsk2tNfOkKU1WeDrMXwpyU2q6hsjxxntGNrzv8OSPKCqBj1OTlsxyTFAVV2U5KpJtqmq80cO9wD
gNXMvb1fV79JqhZesqu4HkOSGtLOhzyZZU1W7DrH9Of6INmrzux77B8DLB46xM3D/PsJ2iaq6OMm9hgpSVUenTVS4Le3N5BlVd
eZQ259IcgBwI9ZPWAarzUpyReC+tMu1t6AlEC8FPjtC/eTxtAP7favqJ1P3r03ypiEC9NfnLCb+/bh/bNM/xnQwsD3tgPgS2qj
HowaOcSjrSjf+jF66MXCMp9JOKs8D3kWbd/DSgWNMjP6/xozea7qxjwWH0q6GTkbafkI7iRg8Oe7lNWcBb6MdDybJ6wkZbuLsz
F6fVXV4f053pr1m7lvDzw96IvBa2qX8nwDHAE8ecPvbJbk5rUHCtv3rS17/A5fy7Q88upfynNfj1EjlVTvR3tfu0O/6HG2ew5K
uKiR55nxfTwx1ErZiao4nkryZdYnEdB3LYGel/TLNJ6rqLkNtc4E49wL+hPbPc2XaQeULVfX2EWL9Jy2Z/CWthOMLwHE18KSM/
ru7OusX+/94oG3foKq+mwVm8A75JtIP4tvTkpW30kYkvlJVjxswxpm0JOU9wNFVdcFQ254TZw3wiqq61BvJCLFeBVyXdnCffn1
+YMEf2vxYV2ybrt8Ove1ZSnJiVd0yyTeq6ib9vi9U1Z8MtP2ZvJ9Nxcvk5K6P5F6hlw8Nse0NnnwNXa85i99dkrVVte+YdbNTs
a5VVacOvd2p7a8BDquqh48VY0682wLfmtR+9/eEvavqhFnEH0Lmn4g3UTXshLw9Fgjyo/nuX2Ks9wPfpJUNQruStE9V3X+J291
gSdtQVy5X1Mhx99P+sRXr1zYOpo+A/S7JTks9y9mIewCfp9V6/XTEOFTVIwGSXIOW6P0bcA0G/B/ol51fyJxZysBQZ6XPpJVPz
Dd5YOh64NtX1U3TJi29qCd9Qyd4n6mqhw28zUvp/8+DH2gXcBXaCdj036IY8HeX5Ma0kcmr9NtnAo+sqm8NFWMq1r60Edc9WP+
Eb8iRllFLN2b4fjZxeJIn0uoyTwR2SvLqqnrFANs+kfb/FGB34Nf96yvRRisHrd+d0e/u/CTbsa5u9tpMlSMMYc5o26UeH2pwq
f++dpnR1V2AN7J+je6589y3JL0E8alcusPDIJ1eZlnCV1U/6seCyYn3F6rqlJHCXbuqHjB1+0VpXbOWZAZle8AKTI4nv5gZjBr
9AfhGWtuw6RGwpw0VoKqenOTqwK36aOhXquoXQ21/WpKH014QN6HV6b2BNno8pINptXKjzFKuqoP651m8mfyhf/5dP6H4JQMfe
IHrDLy9DTk5yVGMPKJbVY8ZcnsLOAR4ZlV9FiDJHYG3sO6y9JAOB54NfIMRJvp0B7N+6cafMXzpxujvZ1P2rjaB7WHAx4Dn0pL
aJSfH1Sev9Ss7R1XVx/rte9A6ZIxh7N/dC2jtHHdLcjitveOjB9r2xCgDSQv4IfDF/n4zytXdKZdcpegxLk4ydF7zX7QylA8z3
nvAetLbu42w3acDj2fdYMU7e6wh5lDN9fsk+1fVcT32frSWhYNIcijzTMSvqkHKXldccjzDUaOP9o/RpC1e8krgWNrox+uTPLu
qjhwh3L8C/wu8iVbT+sMRYsxklnL/vR1dVeck+XvaKMFLquqkAbZ9MPBF4Ki0RVL+hdZBpGjlFUPafm592bSBa81GH9EFSLIrb
YLSfn37xwFPn1N7ulQ7TBJjgKo6NuMtpHNGVR010rYBqKqv9i9/S6s3HsPo72dTLpfkcrR6+jdUmyg3dP3erarqiZMbVfXxJC8
ZOMbEqL+7qvpkkq+xbg7F04eeQzGr0bZu9Ku7U05Nm5z5xn77SbQJgUP6Q1W9buBtbsy+I233cbQ2e+cCJPlnWjnnGMnxE4H/7
LXH0K7yDHnSP12Tvy2tg8xgV+BXYs3xl4C/mzNq9E9VNcao0ajSWhv9+WS0OK0NzafGqDXr278Rrb55f1pd6Peq6hEDbHdyye5
GwPVpB5LRZin3UoebJtmfNsv/lcDzq+o2A2z7lbQRyBsCp9Bm9H8JOH7oEfEk5wBfZf7keNBas1npo2vvop3AQuta8LCq+vMBY
3yQdsIyHWPfqrrvUDGmYt2ZNmHy06z/Pz1kmcjoi9rMUk9Wnkt7/RxAK39451A11D3GJ2hXvt5JOwl7OHCHsX5nvexh96r63oD
b3OCl/4HnUDynqv4lyeuZf7Rt8CsISXaYJGFjSXI1WseKO9Ge16eBg4e8ApvW5eW6tIl40+8BY7VdJcnRNULLtSTfoJ1Y/qHf3
hb46mSuw4Bx1gAvr6pnp/UIn7QtHU0vTfvUUMfNFTdyzIxGjTKb9kpbzXkR/5KRlvTu/6C702on96Q15x7qEtFkdGBWs5QnPSY
PAN5YVR9K8sIhNlxVzwJIa9mzLy1RfgxwSJKzqmrvIeJ0359VAjyjEV2AXarq0Knb/9FH44f0WOBFtFHv0Or2xxpxfQxwA1pP8
Ok6+iFH3HeeJMYAVfXrftAfTNrs9PmSosEXmuijbNMjbT9K63c8pANp5QgfpD2vz/f7Bpep1QWBvTLc6oIbWnhh6DkUkw4Oawf
c5rzSFgR6G63v+eAryk3rx8+HDL3dOW5Cm0x2J9Z/DxjtvXuMxLg7lNaZ5IP99n1pf6tB9drzW/avR02Kp1yXluMMYiUmx6emN
TCfHjWab4WhpZpFe6Wj+wjIu/vtB9Nq9MZw3NTHG4ZMiuZesuuJeNXAKwlO+b+0riV3Af45bUnMoU8qtqOtuLNT//gpre50VEn
+qKp+NsKmD6WN6P5lv/3wft9gI7rdmb2+ffI/fSDtpG8w1TqsjFErO599hh5VmccsFrWZvky7Le3/YLS2e5mnDSLrLwawJNW6U
jw9yRVGnHcy8ULaSn/H9tgn90laSzLjiVgf7p9HXyOAVsJ3N1pHqckaBXfY4E9spn619fFcerLcIHWn3f2Aa401wTDJv1bVwVl
gOfmhJv71bb06ybG0q8cBHjNEOeICThpznku/8jqZnFu0xYCeO8S2YWUmx7MaNRptZayJfsnhAbTRvACHVNUHN/JjmxvrpjDup
a60mf2H0keSk/wGeGxVnbjBH9x0DwLuDryyqs5K8se0SVNLluQQ2kH9HOAEWknFq2vglnfdfC/kjzHOCkmzGNGF9vp8A+uWkP5
iv2/JZnkQmfLlJHtX1bdH2PbELBa1mXuC8q9pi7b845BxYOE2iAPHuH3f9uijk8y/uuCST16SbLCl1ZClO1MxZ9F9ZewV5aZ9i
FZe86kRY5xC64YyymR51g30vXKk7ZNkx2qTZK9CmzD5w6nHxlqyetR5LlU1aj37ikuOZzhqNPrKWADVVngZbZWXiRld6no78KS
q+kKPuT8tWR66wfjO9MuDSSaXUb470LZ3By5PW2Xr/2hN388aaNvrqapj5rl7rBWSRh/RhUt6Wo+RpMIMDiLz2B94VEZsml8zW
NRmTn3rVrSR5LEOLrNog/gaZjQ6yXirC957A48NPlm2m0X3lbFXlJu2fVUNNlq4gKsD303yVdavOR6qldtk8Ggt8Puquhguqdu
9/BAxaFcN78W6VogTk1HXQcur+r6fWVWDDFrN2fZMavVXXHKc5HrAs7j0ZZSh638O5tLtlR45ZIA+cvDPtKQ7rDvw7jhknO5fG
f9gcs4kMe4xjuuXPob2UdZdTtmW1mLte7QR3yWpqrunDXnciFZv/DfAjZP8ijYpb7ArBwt4y0jbnR7RLdrBffArLkmuRVtN6rY
9zvG0ZG/JM8inDiI3q6rXzon7dNoKTEMbq/ZvvkVtJjOtd+9lFkNO+Jmub72QVor2oAG3P23SrmnMNoizHJ2cb3XBJXfGqNm0P
Zxr9O4rzL+i3Bgj+gAfSXLP6i39RjL2e/7Ep2mlgpMyoe1ov7slNxuoqnv1z4O/DheId9HGktglmLyXbUs7yT+FlgvclHa1d/8
hgqy45JhWv/Im2iW1sd4MAfas1mLpkvZKaS3Ehlx551+Ae9fwy13OawYHk6/0WuB30xKjBwPHTl4kQx3s59aA9u0/YYht9+0Xb
bToLFprut/QzrpvzQhvlGkrCb0d+HhV/fvQ2+92mzvSkdZ3cpDVC6e8i7bAzP367YfQ/h+W3ElkyqNoB99pj57nviXrJVWTWfH
bbuTbN9UsF7V53NwTlCHqZhfwkbQ2iK9gvDaIsxydPKCq/o6WIAOXHAvet5SNJnl4Vb0z8yyBC6P1BX5BkrcyYvcVWq/79RY36
u81XxwwxsTTgecnOQ+4gBEGmKpqjJPu+Ww7XT9fVb9Nsv2QAZJ8uqruvLH7BjJKb/1JrX6S9wAHVdU3+u0b0wZOB7ESW7mdWFW
3nEGcr1XVLTZ23xJjfLGqhlrPfmOxjgReTRs9vC3tYLJvVQ020zczXAZzntiD/G3S2lDdnlYHfgHtDf34/vkbk0teQ0pyF9oJ2
G1pbyT/UVVDlYlMYoz+/9y3eULNaamX5MtVddsBtn0g8FDayMD0AjZXBC6qEZb4TXIfWvJ6DVrN4R7Ad6pqyVcpZmmBv/8o76V
JLl9V502+pp1U/GFy30AxdqadDN2FlhAdQ+u+Mnip0FivnSRPqKo3Z4HlcGuE3sRJ3knrvvItpjovDDmBbVbvNWNLclxV7T818
euShxjhCm+SLwJPnQwi9frw11fV7QbY9ra0K+GfBe7IuvK9HWmDMjdcaox5Yh46z92D/a8lObmqbrax+zbXihk57oXkAB9O8iR
aC5/pM99BCsrTVlq6J3DNJNPtiHakXY4cIsZkIsbaJEfQVuAZ6yx+Yr5LXU8eMkDNaPb1nJGWrWgT2M4YaPN7AkfSSgFOH2ibG
1RVnwI+ldYs/UDgk0lOo5VYvLOqLtjcbfda89sDu8z5ve0IrFnCbi/ks0meB7yHdVcPPjp5/S7xdfol4HRazfn0aOs5wNeXsN0
NeQntpOVTVXXztJZkg7YMy7iL2tyAViK005wJYDsy/Ej4xPH0SaU9IT4vbZGLwZKjXpM96tLrYx8LemK8Bji7ql6z0R8Yxj5zr
7wNZRneayZxr0xr4zXdcvXzS91uVe3fP89qdcGDgfcl+SntvfMatPfPITyhb/8atLrjSXJ8Nu1K3+BmUDb0nX4VZLrX+WATp1d
Mcsy6QvLJH3Xu8PlQBeU/pRXG36fHnDgHeMZAMaYnYvwOuOvU7VEmYsziYALzt3CqqsFaOHXTb1YX0mqQB5nUWFXzXuIcW5Kr0
l7cjwBOok2c2Z9WQnDHJWx6G9okzK1Z//d2Nq2LwNAmb+aTbguT1+tjWeLEj17i8CNgySMpm+CCqvplkq2SbFVVn01bVWpI/1B
V70ubwHo32oTDNzFMKcr1aSVBV2L9951zaC2wBpPkj2gn39tl/ZUfd6SNWg0Zay9aLfCerD/3ZMjJoKMfC3pt5n1Y191lbGN2X
5n1ew1J/opWWrErcDLtRPZ4BipJSpuU//WquvEQ21sgxq2A06rqq/1k9gnA/WlLig/SprbP0XhtkqfWOEtFX0rG763/GOCvaVf
BQyvh2nOgba+csookt6b9A53ebz8KeACtJckLhxo5nop3uaWM2G0pkmyoVVNV1WBLrmaBFk5V9bihYqxGST5Au9T5DlpJxelTj
62tqiUvJZpkj6n62a2AK9SAzdmn3uB/1m+P9vpMclvam+4NaQfkNcC5Q1/m7LE+RWuU//9oI9a/oK0wNdiKnElO6qPS/49WuvO
uyX0DxrhdVR0/1PYWiPEoWu33vqy/2MQ5tP/rIVcVPIXWfWe9rgtj1IdOHwv6KOVuVTXYlYokL6P1Uj+C9WszB1+BLcl3gGvTk
q5Ruq+M/V4zJ9Y3gFsBX66qm/Xk8kVVNdSIK0kOB/62eh/yofWrKnepql+lTZJ/D+3E72bADatqsBOLJE8GDq/1V+M8sEaY65L

ZrJZ6M1qp3YNp/9NHVtUbBtn2CkqOZ/YP1OPtR2v+PukHOXkTWfIIdZLHA8dW1f8kCe1N/gG0UbFHDXE5dSrW38xz9w60NdavW
lVXGDDWZFnnyecrAB+oqrtu9IcXt/0NzrIeeNRoZjLPbOvpus2BYryLVlpzEW0UbCda/+ZXDLT9Wb7Br6VN9HsfLRF7JHCdapO
mBpW2+ubvaeU7D6P93g4fsrY1yUdobQPvAtyyx/tKDbiMfGazWMIk1gOqtagczXy17SPGOpY2erw1bXTyDOBzQ11lyvxzNapGm
KORtsDMfMF+NGCMUd9r5sT6alXdKsnJwG2q6rwh6057jM/QEvCvsP7JyyDHmySnTF7rSf6N1lHkhf320M9lvjrdQU/ENxJryc8
nrWPZQ1jXjvQI4FlVNe//9uZaSWUVa6ZGnx5MWzDj/cD7+wtjaG+jXTo7keG7Ojwd+I/+9YHAPrTLzTenLbv6J0MFqqpLajOTX
LHHfgwtednQ8qWb4w/981gtnG4HnEbrfnACjNYTeNZeyqVXRrykbnMge1drAv+wHuu5tP/toQ5YM319VtX3k6ypqouAQ5MM0Xd
2Pb0e9EPVJvpdDIy1uthoi9pMmcViCRMfSesLvCfrJ+JDlle9Nm0i2zGsP19j8NFWYKf+2vkr4NCqekGSwUaOa7Yr5Y3ZfWVi7
PeaaT9J64zyX7S5Gr9mXUvEJUlyHVqP47kTI/+UdjI7lDVJtq6qC4E7s/4CQEPnaFslSfVR0f4et83AMSbG6q3/Xdp72b2r6vs
ASYYqeb3EikqOZ/gPBPCbqvr4CNuFtuLSpGTjXsB/9pGoTyX5l6GDpU2GeiZt5Osw4BY1zopvH86lWzgN2bf3j2jLHU+6FnwUe
HdVfWvAGDMzyxpN4HJJLkcrEXhDVV2QZMjLRrN8ff4urX3Xyf31cjrtasigej3o75LsVFW/GXr7U8Zc1GZiFoslTHyI1v7wRKY
S14HdhFaffyemui4wbPu7ia37CcuDmGrnNpS0jh4PYNyTiUmsebuvMECP+Cljv9dcoqomLSNf2Efgd6LV6g7hX4Hnzy2hSXIur
aXn2waK827gc0nOpF01miyidR3a62hInwDe20sgizbCP1aeM19v/SGuVD2ANnL82SRH0wb6Bh8oW0nJ8Sz/gaD94l9Bmxw39Mj
Exf3N9te0ROJlU49tN8D2L9Gfw/2BQ4Cb1FQfxYHjbAV8utcyvb9fKt52yKSijxIeDRzdDygH0voov7hmNMlgYHej1WjuSmuzN
3EO8PyBY72ZVv97CvD5fnl1yDrAWb4+H0GrM34K7erObrQ3zDH8AfhGr5+bvqQ65Cqdoy1qM2UWiyVM7FpVoy2e0t0PuFZVnT9
yHIAX05KK46pNmroWbQXNocziZGJi9O4rjP9es55JHTjtffMc4Ma0wZml2nO+2vKqWptkzwG2P9ney5J8Gvhj4JjJqC6tlOupQ
8XpnksbuPhr2vvNST3u4Gqk1VKr6oPAB3vJ231px4CrJ3kj8MGaf+XZTbZiao7hkok4k3+gc/t916MV/A96OW3MOrAk96K9gaw
BPlxVj+/3/ynwnKo6YKkxpmJdTHvDvZCRezUmOb4G6Mm4kRiXBw6gvaHvSVvx7+1VNeRlrpmaRY3mAnEnI71DbW9mr89ZSZtkd
ilVNVaJBemL2lTVYAvbpPVq3QE4v3+MthpnkkNo/Vm/MfS2p2IcQesJ+4uxYkzFukoNPOF7zva/WSN2Q5gTa21V7Zs2ofHmVXV
xkq9U1a1Hjjvoe83Udl9CG2A4lfX7Ng9xnP5+VV1nUx/b0mX9SWynAu+vgSax9e2/nvVzjfUMPLAwiXkV4C+BBw9Vq7+ikuPVJ
MnWwBWnyxv6mVDGGt0dW5IX0frNfqBG+MdKchhtVODjwHuq6ptDx5ilrFsh62+Y582kBlghK8uzCteo+snlS7j0ZNkxll2fTGa
jqobqpb2YmCtu0YSJJN8GrsO4HRGOpS0X+1XWv7I3+EhVkv+hTcQ7lLZgwqDvbbM4mZiKNYvuK1cH/gm4RlXdI8newO2qaqgyh
OlY36NdER38CkKSdwOfqaq3zLn/ccBda8COGGOb1SS2Hmt6QOFFzFlVdsyBhSGZHC9gli/wHu+Qqjpo49+55ZoanbqQdjl60KS
lj4JPLm2PvmLR2DKDFbJmEWPWknyfVir0jTFOwnqM0N7Un0L7/9qK9n/9+qFrQTP/ojZXraq7DRgjtDkHe1XVS5LsBvxxVX1lq
BhTsWbREeFPF4gxRiu30DqJPJa2hPwRtNZ0/73E7X6TNtq5NW0Ri1MZ72Ri96r6cWbTfeXjtBOJv6uqffpA0Ek1wuIjSd4P/PU
YVxB6DvBB2pWWSZ/rfWkT2O5XvW3lStCPnV+gLSM/mcR2ag3QfWsjcU+qETphzILJ8QJm+QLv8VbsSJE0S73k6c41wlLeUzGeQ
Vsd7aCq+kG/71rAG2mr2Q22aMOcE5cLafWa76+qP8z/E5sV4420ROxOVXXDXqd5TFXdaqgY88RcryNCDdwnticvk/3/yoxKLP6
MtiLXDrSa2ufVZvaPTuuscLOFHh/4ZOKS40uS91fVWDX60+3VLkmMMnBLsqlY+9Jqtr/JSFcQ+t98Uvbyrar6zFDbnpUk96ONH
N+eNm/nPcBbq2rIblLzxV2xec1KmpA3aztX1XuT/C1AVV2YZMwWSKO/sY+t10rO9RvgR2PUm610WX9J2ksZojZrFjGWWwXOAjyX
5HOsfEIcsEXkk8OfVVpacbP/UtNZExzDgimYzGr2/TVXdIslJPeav0zp+DC4z6IiQ5EG0rjjH0kZaX5/k2VV15FAxpmJNr175c
9okqaNoie372Px2lT8YMgHeiOnZ/KOOFgLn9t/ZpF3YbRln0jy07kv/zJzFYIZUVZ8F5puDtGLUjCaxrSYmxwub2Qs8yQ41/uz
uWfh32iXhSe3cTWijK1dN8kRfgJdy4sa/ZdAYl6r/WqFeBvyWNio5Vo/Oy00nxhNVdUZam6oly2wXtbkgrafp5P1sF0ZKJphNR
4S/o9XK/gIueT6fAgZPjmk9x98B3LfWX/p2bVpLrM11tYXmAsDgJ3u1wNeDSXIw8EXayeuHgGsl+SKwC22y1BjOrKoNDgBonWo
TpQ8HDp+axPY82gn/IHp55eR/bPskk04lK6r80eR4Yc+kjQ5ce+oFPvQqfLenLbN8BWD3JPvQZqk/acg4M/RDWk3TtwB6nfaza
QfLDzDgC3A1mMXEhOkYSQ5eKZMhNuIqNdCqixuwoQk+Q03+meWiNq+j1U9eLW254gcCfz9SrAuq6pdJtkqyVVV9Nsk/Dxxjqzl
lFL+k1dGO4foL1bZX1VKe1xrae/8sFjPapycpofVVHyNh2RV4LXADWp/uT9JG9o+Y70RzICemLbt+FOMvBrOqVOvA8ub+MeR2r
zjk9paLNccb0OuMr097A/lerVu4Y6jtn0A7SB01VZs1s7Y+Q5uvrmxy31g1Z6tBH/V6LrA369doDrqgwUqu/5qW5OW0WeSjnWz
1Eqpz53uI1r97yaPHfSR3sqjNTRl5UZskN6D1VQ+tJ/l3Roozi44Ir6D9ziarbz0Y+HoNuNDJ2CP7q+X1OFcv19mXVt96u/5xV
lXtPUKsmS29rcsWR44X0A9c92TdqkV3TTJ466uqOq1Nhr7E2Eu7jul7vYbpPf32g4H/TutNPOiJxSpzOG0G/AG0FYseBcysbdg
K9GTgOUnOo/1fDX65rqrWDLWtDcSY2aI2SV5LG8H7tyG3OyfG7n3S3V/QOiI8g3UdEQbp8JG+pG9VPTvJ/YH9aX//42mvoyGNP
bI/ixHj5bAdbZXPnfrHT1lXajeomuHS27psceR4AUk+Rl8di6navCEnzyQ5krYy2htoNXpPA/atqocMFWOWkmwHPIl1B6zjaHX
If6AtX7si+zePLcmJVXXLJF+ftG9K8vmqut+BvK9K8rmqmrdd1SZue736L+B3k4dYQfVfq1VmtKhGrVmtKhNWu/RBwPXo5VXHFFVaweOMXpHhLSVN+db0
ndf4AVVde8BY406sp+RFxeZtbR+zTeirVJ3AvBl4Ms11ct/hJg70eZR3KHf9TngxTXucu+6DHDkeGG71oB9JhfwRFqN1jWBn9B
qcp88cszRVNXv01bHOYaWkE2XopgYL2zyOzo9yQG0kZZdh9jwaqn/glYWUFXfXaAryoqrM8z6i9q8qEZc1KbXmh/WJ+E8APjnP
tJ73QHDzKIjwkyW9O3bHHVkfzUlxt3uwOVpS2v/H+2YdtbIMd9Oa+P2oH77EbQWrPcfOa5WOUeOF9AnkHzaDguLl+SOtNY6P6Q
dKHcDHlVVn1++vdrypa349gXa7+v1tEuSL6qqDdY8XtakL5SzWuoMswyL2iS5NW0E+b7AtwceaZ0eOR6lnjYzXtJ3ViP7q0Vaj
eCNaPXGt6ed/P0KOL6qBu+Us6F5LkPH0mWLyfECetPsd9JmQI9S15hkL1rPzD2ZGsUfuIXTzCQ5EXhoVX2v374e7TLkLZd3z6T
Ltn6yf3/gf4H30pZ4P2vgGJNJjKHVnQ5ewpMZLumbVbZc/Swl2RXYj5Yg34u24uOVRohzPPDsqjqu6PeGVV3W7oWLpsMTleQ
JJTaaMrYy5RewrwNi5d1zz4EqizMF0zu6H7tL5+EvFG2kSjGye5KXCfqnrpMu/aFqu3QdyT9U8q/3PZdmgLl+SJwJEjttSaicx
wSd/lGNlfyZI8jZYM70cbUPoibaLkF2nH0cH7aie5Ge1q5U60v8uvaFcrL1V6I20Kk+MFJPkEcI8xTBTMU6oqtuMf1ZS/J22
kHkHf2uhwFbV9Vjlm+vtnxpK709G3jzamjpN7Yk7wCuDZzMuu4uVStztb9RLVSfPbHS6rQnsgqW9F1tkrwa+BLwxao6fcJaxJy
qvwMeXFVDdy7RZYJ8QKS/AdtUsnHGWmJ2iQPBa5YXwP8F5VHaoAIaMLhHe9J5f+9y96lbQ/Rr7aBf7+fRU5FcrtGH3/cCyqDmOS0MpNbi2PFC/wSr
HusKzqryVR99ra0EdZTaK/NmwInVNX+y7Vv0ubqyfCTaZPZP0RbHfHJwLOAU6rqrL5Zx97QK2K1iYT/oH9sw3hK1N6HNrr0T68o
qqt9ecXoS/Or+ocU7M8m1Wbe07wOBmY68rDDfBP4If0cbNekDm+Q9wEFV9Y1++++D++8a0REJaid4B/JpWtvF42pLV29CW+D55GfdLq
4Qjx8soyXeBm1bVUMvRLosk762qZXWmn/9q4s5XhXIYGm6Ik4NjyqGbm9eUkd01qT16kCfU8axfbrDUp4SZNEq4
GVd2kf70GOBPYvarOWd4902rhyPEC+gF4vkRvyFHdU4Ar0ZZXZ5Xcme3j/fa1n3YoWqqlOBuyTZgdYd5fe0dlsmx/N74dTXoZXxH
Lg8u7JifCfJW2kdeAp4OPDt5d0labNdsuJqVV2U5AcmxIdSRTSQCTmmN1rL83ByvQG9ZAOQ8uvtOaF3S8kp8urOTTL5RiJXrXW
hC7NubvP1WeoPpTX//wGtNdmgSy6vJkm2BfG4a+BPaCcXXaAtqPG5Zd0zaDFNtA2H91oF2EtEgHDleQFWdOOeuL/auAkMavCn6c
khyW+DltDY6L6HVg+0MbJXkVVWk19HLu3xbMurlN0FvePYQ2SvxL4AjaCf6fLeuOrQBV9Yd+NeyPaVclrgwcubx7JW2eqeqm2Pu
g1c2R4wX0ZVYntgJuCbuyuqq6/TLu0xUqyFng+rdfkIbQWeF9OcgPaIA3X9Yd3EJZN7dpet/ZLwCPq6rv9/tOraeqlipe8RY4o
XhWVe2xrDsmjSrVswRt44XdiKtNi/AhbRLt4Neguwjrq8hbkgVVwDnLsCLwlt0maBbaq3dymeQAt0ftskqO
B99Ben1rYd2knFPeeOqF4xvLukiRt2UyOF1BVe80gzBtoB/v30XqQPpLW93ilmV4o5fdzHvPSxML2SXJ2/zrAdv22dXPzqKoPA
h/sExfvCzwDuHqSNwIfnJygaT2eUEjSJrKsYgFJngwcX1Vn9dtXAMX+dtXBg6sqn8fMMbaqtp3eonlJF+qqtsPFWMWpiZHTE+MoN/etqo
ut1z7ptWtlz/9JW1VrBXZH3wWpk4oDqT1UT8MTygkaV4mxwtYoC/oJSuYDRTj88BdgLfRFjQ4HXhXVe29v7rz7zt6XBf1UEmX2ml3b6VGj
pJ8Hdhn0oqsT5j6elXfYW7/bPf0VbPwPYEXjjpDZQkiRJs2N8cI8c4uYCPoSm97ajl6KvY8xprW5+dKgBc+bKIEfqsJaH9vT+A1yRv
lSZKWgSPHC0iyFAE4M602tljgLdW1UduL0hjeIj5T/l9wlJv+d43xE6gBTlqDtfVMx7fq1z8pCpnv8jTMuMr/5Py9kRpmerQ/dj+
hh3x1XVr4Bf9YkziRJWgYmxwuoqt8CSyz08dqbOCi/6bMSPdDGP97SJD4bzOCBR3XaEG5uf9HHR7u8vqXeWl40RzyTUEPPUj9Hxn6
kZbJvkxA8a4EzBpDfetqvrMUNuWJEnpSPSjM5XkCSywNPbyaXyh5/Hv6j3qjpvWXdMkiRJzOAkuwBU1RnJHo6vDg8UIKN20FvVk4
zwiRnAt8FvpfkjCT/uNFS1V2dnVxFGnQYLTB
zwiRnAt8FvpfkjCT/uNz7JkmSpHGZHF/awcB++K2q6qVdRXgXgNsmSZMUeSk4A/r6oz59y/C3MVd18efZMk

iRJY3Pk+NIuNzcxhkvqji+3DPsjSZKkGTE5vrTzN/MxSZIkrXCWVcyR5CLg3PkeAratKkePJUmSVimTY0mSJKmzrEKSJEnqTI4
lSZKkzuRYkrYQSa6e5F1JTk1yYpLjk9xvufdLki5LTI4laQuQJMB/AZ+vqmtV1S2BhwC7DrDtNUvdhiRdVpgcS9KW4U7A+VX1p
skdVfWjqnp9kjVJXpHkq0m+nuQJAEnumOTYJcm+W6Sw3uSTZIfJvnHJMcBf5nkrn0k+mtJ3pfkCsvzNCVpy2ZyLElbhhsBX1v
gsccBv6mqWwG3Ah6fZK/+2M1py97vDVwL2G/q5/5QVfsDnwL+HrhLVd0CWAs8c/BnIEmrwNbLvQOSpEtL8m/A/A/rTFh34E3DTJA
/vDOwHX7Y99pap+0n/mZGBP4Lj+fUf0z7elJc9f7APL2wDHj/4kJGkFMjmWpC3Dt4AHTG5Ewb5f0x8NSq+sT0DyS5I3D
e1F0Xsf77+mRBowCfrKoDh99tSVpdLKuQpC3DZ4Btk/z11H3b98+fAP46yeUAklwvyRY
0naAlRVJbkv8JokzwHOoI38Phd4H61c4mt9wt0ZwH03YdtnJHk08O4kl+93/z3w30PtvyStFi4fLUmSJHWWVUiSJEmdybEkSZL
UmRxLkiRJncmxJEmS1JkcS5IkSZ3JsSRJktSZHEuSJEmdybEkSZLU/X9brSTVPFThrAAAAABJRU5ErkJggg==",
"text/plain": [
"<Figure size 864x432 with 1 Axes>"
]
},
"metadata": {
"needs_background": "light"
},
"output_type": "display_data"
}
],
"source": [
"#merge the genres back into the original dataframe \n",
"expanded_joined_df = joined_movie_df.drop('genres', axis=1).join(df_genres)\n",
"\n",
"# Compute the average rating per genre\n",
"avg_rating_per_genre = expanded_joined_df.groupby('genre')
['averagerating'].mean().sort_values(ascending=False)\n",
"\n",
"\n",
"#bar plot\n",
"avg_rating_per_genre.plot(kind='bar',figsize=(12,6))\n",
"plt.title('Average Rating by Genre')\n",
"plt.xlabel('Genre')\n",
"plt.ylabel('Average Rating')\n",
"plt.show()"
]
},
{
"cell_type": "markdown",
"metadata": {},
"source": [
"### 5. Rating distribution for popular Genres"
]
},
{
"cell_type": "code",
"execution_count": 35,
"metadata": {},
"outputs": [
{
"data": {
"image/png":
"iVBORw0KGgoAAAANSUhEUgAAAuMAAAJFCAYAAAB3OPlXAAAAOXRFWHRTb2Z0d2FyZQBNYXRwbG90bGliIHZlcnNpb24zLjMuM
SwgaHR0cHM6Ly9tYXRwbG90bGliLm9yZy/d3fzzAAAACXBIWXMAAAsTAAALEwEAmpwYAAA/YklEQVR4nO3deXhcZ333//cndiA
JCVkIpA1LzF6B2Ur4UYr7YNWUsgXowiL2okJpi1m6kT5KgULVhy60BVpKA2IHsQQoS1p2GXDZE7aCoLQJWwmQBAhJ2GLz/f1xj
pKxY9lyIukejd6d6v65rLmnNmzvnOmWPpM/fc931SVUiSJElafYe0LkCSJElarwzjkiRJUiOGcUmSJKkRw7gkSZLUiGFckrRJasQ
wLkmSJDViGJekZZCkktysdR0tJdma5Ov7Wb/b/Wb/uj5Ek7c0wLmmkJPlykh8muSTJd5OcmeSGretakOSxRXa2rkOSNBwM45JG0lVd
STws8C3gOc3rmfFJNnYuoZRlY5/JyZRlY5/JyWtKH/JSBpZVfUj4AzgVgvLkhyd5/VR/
LLk7w7ycvJ3p/kpH3tdz/7GANeCNylb7n7n/w+bDAWBdY9G89vCauBhpcNyn45HPWQ5LcAbhOhUCDHTDN6Ilx7aNZjv/BZU1
Nc5M8oT8mGweO/0yS85L8b5K/SLKhX/foJDuT/G1r97lJ7JppP8BUfnY3OL+AkTjlFsHVYWfjn7+Q8JW+yaZN+RcnmwB4CZqrt4NG
Bj4yMDi5wNHAzcB7gY8EvitqvoO8BjgEbd7v+vdWvR6BNwm8Fqk+6Fsc+ZxYkmlrCasd2ofZNa1zvE89OzfvyzXMmgdMbBBoQzadJPS
/vbXS2Pmdzdvo3Gzr6GkUfSAqnpP3zXh/sD7MTq7k5oyn9Ku8XQsDTr9jB8G+A1L7G2ABj9vTrbHxj1gs3F8/1Ypr0KLhRHewdS12WXPq6V5bOHdvNO5N4JTS6hGMEmEZb4T94d
pd5zT3/nQ+54/EY8+nZSvTcTxVa9Zyd1/xyPr9W92hAvq4LMrpbXoDSq9N+HpoNBhoUOUTqgOXCmhyBX1PBUsEdw3J2ujfeX5TmpAqfDThg/tLIZAsCvNXX5RxeoCuGCEzsy3xq
ead+6n/Rn3dRwwsexXwqv7nTf2+bjKw/r3A7w3cvyVwVGbAR2Ap8fR/H6O79z88APjKw7hDgPOCX6ELrV/d67p8CL+1/Pge458C
6x+29r72eW9/veA9/Y/3xn4GnBIf8/TwIMW/3643P/4wPoJYG7g+P/3tgsbRP643/4wPoJYG7g+P/3wLoj+uf+TH9/B/DMgfUPBj641
/7/BXh663Pdmzdvo3Gzr6GkUfSAqnpP3zXh/sD7k9yKyLnRdA/jKwGO/Qtfqu+B04AnX1bVhXtt92sLP1T/VJUm+A5w4uJyuDutV
A+9ifE4HvVNUP9trv0oNQB/d54j72OXbkR8MDZ4xH3uZdqx+AH7QEk3uAiFvJvi1gWlBq4u0Lz/0ZaE2zQjfrMMMKhHLC/0MKHOh2
9nG3vsd/Pkk4FDgvIHG2P2esh0ZyH3K61qDEglUrYJn2Ffnh2yCw5Eqz0qCDYjcVSSOrqnZX1Zo3qH7J2jmmxM2ga4yWdrvt7H4m5S+Lo7WrC3ABfQtrgP9vW/vW/Hj29TFvz7gFPV/
Fpmv1fAXwu7nyNHyxB+IkR9J16/jGXo/ewAacoAu7z+nAcc13exudwJ+B1/ewM/f2Mf+dtENXr2UrvV3oe4NwNwN79sAdf1yHADfptf

g04t6qOGbgdVVX3Hqh1sLYbHeC17f1absSex+/ldF1VHgGcUV2f/305r69xX9v8Gl3L+PEDNV+7qg6mW8ngsf0a8P69jsGRVfW
7B7E9SVqUYVzSyErn/sCxwHxV7QZeD0wnOaofgPkHdN1AAP5v/+9jgL8FXrEw8K937yRbklyDru/4R6tqsBWVJezjW8AN+m1cS
VV9ha6LxjOSXCPJXYBTDvBSZ4Gn9AM/jwT+EnhdVe0C/gs4LMl9khwKnAZcc6/n3zHJr/cDIJ9MF2Y/Qtdv/ftJntoP1tyQZHO
ShYGarwf+NMmxSW4AbD9AnQB/3D/+hsCTgNcNcrNcNrHslXZ/yh9N9IFrM64EnJbl+kmOApy6sqKrzgHcBz0ly7X6A6E2T3Jte3L2
4FbJHlE34/+0CR3SjcYV5KuNsO4pFH0tiSXAN8HpoFHVdXn+nXb6VqLzwF20g3Me0mSO9KF5kf2gfqv6FpIT3Y7mvoBi1+B7g
j3YDOfdnnPvp17wM+B3wzyQWLPP9hwF2AC4G/oAusP97P630JXZD9AHAu8KO+BqrqIrq+2S52S+ma52/FNj7wjxvoesb/V26Vulfr
6rL+uNwCt1AyXPpWv1fTDc4FeDP6bqanEsXgJfSdeMtwFl0A2DPBGYWVlTV14Gz6Y77B/f15N6L+v19Bvgk8G903wTs7tc/kq6
r0Of713QG3TSXB62qLqYbAPoQulb8b9KdG3t/oJGkqyRVB/rGVJKU5U5Gv0gxNPa7Dv1wFfqKqnr8C2nwHcrKoefqfDHroYkLwG+c
TDHuZ+a8IVVtc+pJiVpmNkyLklDpEdpu8GcdO+i8U96Qah/mvjslZckk3ArzPQah/mvjslZckk3ArzPQWr7I4w5Pcu8kG5Ncn+7bijevQomStOwM45I0f
Gboq9S4DnAb9bVZ9sWtEKS/Is4cLouMt+l66YyDzxtZSuUpJVhNxVJkiSpEvGJUmSpEYEvGJUmSpEYM45IkSVIjhnFJkiSpE
cO4JEmS1IhhXJIkSWrEMC5JkiQ1YhiXJEmSGjGMS5IkqRGDOOSJElSI4ZxSZIkqRHDuCRJktSIYVVySJElqxDAuSZI
kNWIYlyRJkhoxjEuSJNGMYlXSVJXpjkz5ZpWzdKckmSDf39HUl+ezm23W/v35M8arm2dxD7/YskFyT55irt75IkN1mNfQ3s8
9eSfK3f9x1Wc9/LJckzkryqdR2S1ifDuCQtMOR6DfBxwyLaCy9iqZ+F0odb8DbSPrdyezDnYrr3KwfdbgrkiOuE8Q4uixvzr4UPdHZcZm6r
qe1XVy6/utg+yjhsCfwjcqqp+Zh/rtyb5+S6Odn/P4tf8/ws8od/3J6/uxvrX9aP+uFyQ5E1JfnYZ6Z7D9sl+L+lGzFGkWzqoUCuyjmvE+i3ycY6vA4
lxVSX4lyVz/3l6Y5FNJnpsna1SRouhnFJizmlqo4CTgKeDTwTVmGLkZ9/f38C8Ll2bc2Tb1sjTbWq0QngoWc3BWt3KdnXf4fk385c4u6vVNVRRdW1bF385hvVNbXAAvSnLLVal
u+ZwEfO6qPHHhm5B9eEJ/XG4BHAP8/VUrbeXt6zUkeSBwAa4KSqug7wVZR/T8krQuGcUnqR2qFefeGWM/E0RSzbSAAxtuoKTIqHAd9zn0sGfUjMSZR3FT/zcf
kjysiR/0f98fJK3963o30nywxp0Lq55Q/Za39c/cOHtqOdXz3FRSRSZvhZYYDNp7UMAsAuBmApJvZVz/Ruyht9ncwv6N1eZ6WDXDMDOkWGl
ORATNbBRMPvc4HDZ8M//nDHFZaU1C0rUvLDO/r8hQSGbbn/Z8bBbt09VXt2R2BGlXQiJyOwH+11OnjLxxbKt4oXyEZFkBNAGoynQ3uw3kahtR0a
sJr8BjvlqF+rM+qVsrTzvX1GfkUz9yNuoZN0nMWcf5iPtrKC1lEb8zJHtTFKr0HeqYGMqj0+MLLDa6BlO56kThzm5ZU3Ad7xyMfEQ5HqSiX5o+2FQvUDMlUVQsnVLzYXmCKKM7SVnvK2SNxkW+yNL7XLWvyUrB5rzP1Xqot1W1pnJXVpWr7eRsWSrpPkAkA
VNdRC/7QbtljEDXNcv2DW/eS3crqSMvsb3+6O8G6/cT51rn9k9MeHGUlHBdbbRbaGe8o2J+rW3SUj3JnY7UfLy1hnB1X5s0vXRF6T8/7V6e8a3dXWoyWuz1gNhJcrvk5iaJlEGMVWeB22XBn6OD7iFiVPoR6/8oMEEEjvBoeMYWZ48/rQ7mFm7xGMdzMsVYnyX7L7KFScKnehw7mlWDnDj0llzNH2KSMvJyHB1ccfDNnLRsx21XlQPfHULvn6twnVCT6jMn/sbF3bFV/7jy6Khpvo28V2VMlchK3wPyq6K02UEBlvh0VjyC/ul1QpYrO8cDRuD4UePpSVH5yeVxmyHqHKLXR5SjMSQRTXG71J/uQ5qlMPEs1kGZaMV8YNWEQYbYO4DSM9SSQaXmzVYOvuQYnpNXwpWaXMMnBGxePNXPWMdR+fvVwBdTN5FzJVdgzJ9x69IWGhRAGUOJXKpJVpqC+WCFm7M2TZUN3MjkQ1IMp8hPdC1GHr2tRSuQEAWwtIVUtVeOCZfxWN4GTEbAYK9NE7Vj5NBLg8yqHlj4ajx5WB8aJwn6nG3VW7ncyJLZ9hUqNe7Xh1YeBGDlc9OYdOtbU9bajSwkQQG+8mNxk3h2IrSfDmRxGqODdHbStQyX+hb2HI1rlVZUcOAqQkWBTcpHWUwrkRs3tWlqPMxq0eQCDdBMRUxHMETAEUpuGe2Eb7LOoSdnupH4LN0QFNRH4OUiU0aGHknHuX1nlsAy9UbOTnSfqnBVFqk8zWf7W2U6d1XO5JgYpc+h6m9vXl7+bpfhd1UBgNzyTK5UBNeIV+Hd0MwQNDnjgUF8YKyA2rg8hd9jrBRvSdQWqrDvNCiHuQMpy79jmLcGF5dBqb1LJt9hb7RAz8bj0AWHIrJ6wHaG3LOAMRsa1gUbOiChz+TIfjpfqw4PDQi9iFDUfvM+2nFd1W8WjbJNqz0F8RORoLngyFlwLFuOVC0Okv3kZEdlnrm5Cw9BZSBcxGVOQ+ZntJyCBlXrSdzw5iQ7brddhSDKAmJVqtVoqvIJMrHjx4SXQ8tlsdZrYfwY0FV7YX4zr9j8zWLrFj8mNNzdjJhtjquF1X1ZCPfL7uAd1b0hqgFWdy1ZHqxP59d6qnQDaYl6DH07TcJzC5gU8vZsF4Bv5U4qRYRvbJi8Xq0xzIkADgupGWJd3KaNpbDtqvHQ3TTR1jUjuvmRCvrUlEIVsaZmT3qLqm4Vg==

Ux3NYvs61j6ckSdJVYxg/SMPSx3NY+nfC8HwokCRJWmvspiJJkiQ1YhiXJEmSGjGMS5IkSY0YxiVJkqRGDOOSJElSI4ZxSZIkq
RHDuCRJktSIYVySJElqxDAuSZIkNWIYlyRJkhoxjEuSJEmNGMYlSZKkRja2LkCSJO3fplPPbF3CFd7RvpajDz+0dQnSsjGMS5I
0xL787Pu0LuFym049c6jqkUaB3VQkSZKkRgzjkiRJUiOGcUmSJkkRw7gkSZLUiGFckiRJasQwLkmSJDVViGJckSZIaMYxLkiRJj
RjGJUmSpEYM45IkSVIjhnFJkiSpEcO4JEmS1MjG1gVIkiTp6jlq7FRu8/JTW3xBjSAfVqXsV+GcUmSpDXu4vln8+V
nD0fo3LFjB1u3bm1dQkCbTj2zdQkHZDCSZLUiqRHDuCRJktSI3VSkFTBUffffstytAyM+nAAN7yhCNcW/zvLxIDUtvoYGA6YbsrUjxYKA+OAe+4LkAJFDLqzBu5gIA8HgFhoM7A3XoVGxWZFhXSZ45rWkSyRoGMy2XYtJvkoFGL8Pte3CF++B/8a+DDi4LWZMLo5LvMaoQ8tD1QzVSFPiPvVfdyhQPgUb2aovMQ4KNUXiBG4IR6+mxeHFSF2ftW6Ufp4NlvGLnAVaGGdOsh6egWfhfoNKMJ1AfthwAAf3IAIBtM1XXWvPYE2PjQHUgGGffWfEaqQYwx8XHrIFOaBbfBRKJUVqKtNxDOyXOsdOy9DVFlUAUJP9dUbIu2BDaO9IzjZfyuSzGJ9efm/PJXDIaHEaT5OWnd+2e1V1pLQgn2DiE/EAXE5r5/BW4SUfPu7tWRaKNjtTWWh+N+E+S5uZS/LQVOv0m+ZXOrqptRNDyuRkD1QMSBVnlRpM5AglhAc7E1aD1M8d1hl2j6ZAlQ+/1URpHbahcH0l4tbQYmZcXFqTXOQRdbJRYjBl+/UpuIN7KZEOjsFhxvVmqQLzAZxBoK/99vk7twlZYDjRQlXdnY+ZH+KbmGM9yHNPJ4zDAK59mFIsqYiJ7kw+D99YkKMLJXh+W0qxHGS0ShBxuXLaFgqUXhzl5+5oH2Rw==

WrEMC5JkiQ1YhiXJEmSGjGMS5IkSY0YxiVpHZudnWXz5s1s27aNzZs3Mzs727okSVpXNrYuQJLUxuzsLFNTU8zMzLB79242bNj
A5OQkABMTE42rk6T1wZZxSVqnpqenmZmZYXx8nI0bNzI+Ps7MzAzT09OtS5OkdcMwLknr1Pz8PFu2bNlj2ZYtW5ifn29UkSStP
4ZxSVqnxsbG2Llz5x7Ldu7cydjYWKOKJGn9MYxL0jo1NTXF5OQkc3Nz7Nq1i7m5OSYnJ5mammpdmiStGw7glKR1amGQ5vbt25m
fn2dsbIzp6WkHb0rSKjKMN5BkebbzV1d/G1V19Tciac2amJhgYmKCHTt2sHXr1tblSNK6YzeVBqrqat/m5uaWZTuSJElqxzAuS
ZIkNWIYlyRJkhoxjEuSJEmNGMYlSZKkRgzjkrSOzc7OsnnzZrZt28bmzZuZnZ1tXZIkrStObShJ69Ts7CxTU1PMzMywe/duNmz
YwOTkJIBzjUvSKrFlXJLWqenpaWZmZhgfH2fjxo2Mj48zMzPD9PR069Ikad0wjEvSOjU/P8+WLVv2WLZlyxbm5+cbVSRJ649hX
JLWqbGxMXbu3LnHsp07dzI2NtaoIklafwzjkrROTU1NMTk5ydzcHLt27WJubo7JyUmmpqZalyZJ64YDOCVpnVoYpLl9+3bm5+c
ZGxtjenrawZuStIoM45K0jk1MTDAxMcGOHTvYunVr63Ikad2xm4okSZLUiGFckiRJasQwLkmSJDViGJckSZIaMYxLkiRJjRjGJ
UmSpEYM45IkSVIjhnFJkiSpEcO4JEmS1IhhXJIkSWrEMC5JkiQ1YhiXJEmSGjGMS5IkSY0YxiVJkqRGDOOSJElSI6mq1jUcUJL
zga+0rmPIHA9c0LoIDT3PEy2V54qWwvNES+F5cmUnVdV197ViTYRxXVmST1TVya3r0HDzPNFSea5oKTxPtBSeJwfHbiqSJElSI
4ZxSZIkqRHD+Np1eusCtCZ4nmipPFe0FJ4nWgrPk4NgN3PMOlAvwWuWuHyUuCf6XLKOPAK4JVNK1ojbBlfO025QVfdsXYSG3q6quihBR
L8oQkx7auQ8MvyX2TmBekFbKxdQFamiTXBH4D2MTA+1ZVz2xVk4ZPklOAvwWuAdw4ye2BZ1bV/ZoWpmH0M8DHk5wNvAR4ZzmiX
/v2EOC5Sd4IvLSq5lsXpOGT5ObA/wNuBRy2sLyqbtKsqDXCT7prx1uA+wO7gEsHbtKgZwD/H/A9gKr6FN0HOGkPVXUachcHNgBng
08KUkf5nkpk0L09CpqocDdwD+B3hpkg8neVySoCf6XLKOPAK4JVNK1ojbBlfO25QVfdsXYSG3q6quihJ6zq0BlRVJ
fkm8E26P6DHAmckeXdV/Unb6jRMqur7fcv44cCTgV8D/dWHDzjC+dnwoyW2q6rO
tC9FQ+88kDwU29F8ZPhH4UOOaNISSPBF4FHAB8GLgj6vq8vqsr5v8JcAw7gASHI/4Am84BhXAA/Wvj9keQJ
P8C12tc05rgRX/WiCSfB24GnAv8GAhdw9ZtmxamodL/cZwC7tEveifwF1X1a7zbdgdwb1uzH7BWpDk5XTnygf7+XpFWnt1U1
bVb23QVkaMknuRPh7Bjgh7cWJWAGwWc8WDRwF9X1Uda1rUWGbdf6rUWGMbXiCQgn7+XpFWnt1U1
oiq+kqS2wG/1C/6YFV9V9umVnVTvJD5IcvVtsR8N3Oi+XbslaZho6/V7RUSU6m+2b2JPac9c1v8A/
AML5GJHkS8FjgTf2iVyU53YEz2suPgM8meTcDs+1U1RPblaRhUlU3BkjyQuCtVfv/f17AbZ+al/8vaKleDXwx8BngZ82rmVNs
ZvKGpHkM8BdqurS/v61gA/7iVODkjxqX8ur6uWrXYuGW5KzquqOey37FWd3KomDSd/r2gpkuysqi2t61iLbBlfOwLsHri/u18
mXc4/jjoIFyQ5DXgVXbeVhwMXti1Jw8jfK1qipyd5MfBeuokmAKiqNy3+FIHhfC15KfDRJG/u7z+A7mId0uWSnEsXrPbgFdC0D
xN08/++me6c+UC/TNqDV1bUEv0W8HPAoVzRTaW4onutFmE3lTUky9RPpaW1RSRpySY6
sqkta16HhlWQn3Qe3vwdOoQtdqSov5qLLJflsVd2mdR1kWF8yCW5dn/ls31OR+Y0ZDoq+/FpX5L8It3Ff
uPSNGQWxhcMhq0kH6yqXzrQc7V+JHkR8FdV9fk4FvYnZN+0FrNL1dl1uf7bkwWHACCDRzUqR8Pt74FfBd4KUFW
fTvJ/2pakIeWVFbUUW4BH9d0lvTjrpLWxQj/EH/d0lvTjhQTCMD7mqum//r3P/aimeM/DzLrortj6oUS0aclX1tWSPceC7F3us1rUnA0CAT6S7suI48
MiWBWko3bN1AWuVYXyNSPLeqtp2oGVa9yar6pzBBUn8IKd9+VrfVaWSXIMuaM03rknDaVNVfRy4hK6/OEkeCHy0Y0aVUaKgtXBE9
yPQYG+urADmldgPYvyWF9f/Hjkxyb5Lj+tgk4sXF5Gj5nLHGZ9Hjg94HrA18Hbt/r1b2p0tcpnUsyf2SfInuG9n3A18G/r1pU
WuELePD73foviI8ka7f+MJ3yt8H/qlRTRoySX4OuDVwdJJFH1h1bWyh0D5U1QXAw1rUcrh1XUoehHVX5X13sD1kzxvYNW16brBSYOeBfw
C8J6qukOScScZwudUkM40Ouqp4LPDfJ9qp6fut6bNLRuSTfQ9xi6qcWXAw8tkXtB7QuqKBQtDCzJcldqurDrevxXXKB
lwMPKVJRRpml1XVhUkOSXJIVc0l+avfvG146dJ3hJZd8Ba7ywQKoXtC1Lw6Cq3gK8JcldqurDrevxXXKB
DulxVfRr4dJLXVNVlrevR0PtekiPpLiD26iTfxm9QlsR5xteIJJ+qnqtvvteyTVXWHRiVpCCW5Ll1L+Cb2bO18TKuaNJySfLSq7
ty6Dg2/JHcFngGcRPd7ZWHKOqfW1eWSXAv4Id14xIcBRwOvrqoLmxa2BhjG14gknwFuV/0blmQD+0V4kI+CDdV8q
XT1NXVW9sVpSGUpKHAjcH3kU3JzAAVXV2s6I0lJJ8ga5byt6/VwxZAi7PJO+sqru3rmUtspvKkhjR9/Un9bPWbeaNNw6gNrnRh4/M
fXU1kVoTbgN8Ajgl7mim0r196VBF1WVf2+0qKraneQHY6kWqSC8CfxsVTkmS6X5C+AD1XvVTv7W
uRcOtb+28bVX9pHUtGm5Jng1m1sAN6E36JoEUleTzbyruBSxeWV9Ut1RtgyvkZU1U+TfA1W4k8TfAS4CfBg4DjAgfa25OA/5vkJ8BPu
KJv57XblqUh9Gm62Xe+3bgODb+FsQUnDyzzWxTt7cz+poNky/iQS3IL4C0gNsCH2fP1k6nNpR
0lfSTCFBV57euZS0xjA+5JD3D+lG5A3WVX/3S87x1Hs2pckoRvFfuOqelaSG9J1Z/pY49I0ZJLcbV/Lq+r9SE4C/BE6sq
nsluRVWl6qaaVyahkD/d+fpwBPovo09Vo09hG5Kw+dX1TNb1rCqe0txcAdwEe2t+/BK/Uqn3oQ/c
XgKP627xBXIt4Gd0kAif29/+L7srQEnTnwl2BO1XVdarqWLquTXdN4kSn5Pco2lxGkZ37
gf1/gigqr4LXKNtSRpGSR4EfAx4IPAg4KNJfrAJ44IPAg4KNJfrNtVRpSx1fV6+ln3amqXQxMcah175F0FyE8d2FBVZ0DPLxfpwNwAOcaUVWXAq+
mu6rVcXR/QE+lmyNYWnBZP9/rwnz0l8r7wHOaFqVhtgWFw+jotOLSqLth7YVWdn+TQF/jb
YbxNaiqvgP8S3+TBj0DeDdwvSSvBm4FI+7LAHB6pHkgZ0hYeOMBVkWdUUONvZ8G1TL9TWvTw0I/bmLSXe2Xh
vVc03LklDKMnf0M2mMtsvejdVVX29aJSuMlG4JZ0v1e+WFWXNS5HmOGM3mWLUdH8xBJbgn4cCzfPh
DcDTqiq/0jy68AWvGEZ4BGbCpMN+tV4vkT1c9YDkj3M3YDVrnY9XGXmnXAXRr5jCE9XqMF5u1g9XlV6Ykb
VSXJyv+6UVoVpaL2NblD4Z3EMirTsbBmXRlA/yPc36C4YdaOqunnjkjQkkxvxVW1eZN1nq+o2Ii2pVPQlxXaCK4
+lmdNNhbqKbS1pacNh+1h2+alVoLfl3p9KVVo5hXBohSf4qyZeAZwKfA+5YVXY70KCPJ3/DDJ95N
cnOT7rYuSRoXdVKQRkuTxwBn7mvNVGssvbf5muinHFsL3yXQh/q1qvpmq9o0nJKcAzAwA+GwZGqRlZxiXRkCSn9/f+qo6Vq0
dqQZBxY6Dv+uap6X8t6NLySvBO4NaAYZxqmet/PIyulfPTdNPV3Rb4aFVtaVLbputycamwD/Dvx4YblTG0rLw6k
NpRFQVeMASV4LPK6qPtvf3z8zz8wK155/a3a/Q3ScvIlnFphCT5VFXd/kDLJEnScLBlot80leDLwf
V2p5a6qfrlBOdLIMYxLo+W3gN2FN7kjnkCdkG3KKlrWVXBt/DpawHyUcLlhjM
8fyR5f5NipBFkGJdGQJJBAA8BJoALgdcxBGFJGIVuUJvW4GGgUDjnUYjiIzGjA7YmEKgBhnkgf9DQG
HTdU84FJptWJI0Qw7gGn6DrmV8Lsk7gNfS/eGKaUKulqm7cugugzHGOOvJmN0tOS+SMMQi7fCJm
SYwbuH5vk9xqWJI0U5xmRXlTfz/OBwIodgkzSVbXi9Qs+WVV3aFSNFIM45IkaVFfE6hfFM80iPg
+8EXp/khXXOR8PvKNtSdLosGVckvckQGtkshwFHwO8A28PwLO3VXVJLVBvoRFFLHV7gW5amdQiiVDu
kK/By4Mt0LeM3BB5VR9R9oV5U0goF3EMiz6XmlRR/ZGdxE+7O8V0F8FnNqwBuHenan
08kmQFe2d9/GHBWw3U3qkkWI3FUmStKgk1wRMuIT3eHbh/4Bh2xQUHn+AWYmPaZokJ8Enan
AvpjK/CRPa12bNEOM45IkaV+eNVuFNVXaeqgPuDNw0H7O9OfHSpViktLXFXJIk7
cuhewdxuLzfuFMbSsvEMC5JkvbJl1dxnaSDYDcVSZJ0JUl2A5fuaxHhZ1juV4cE5o8SdqTZ2A5fuaxVwWFXZOi4tA8O4JEmS1IjdVCRJkqRGDOOSJElSI4ZxSRo
hSU5I8pok5yQ8mHk/xa67okSftmGJekEzL8CH6iqm1TVHYGHAddDHLwHMOCdWNxF6isetgbMXXcLuBdwdJW2CTcpyQU
EjyN0k+nuQzSX4X4HHkC0Ie3Yd6knw5ydOS7T4AQmOGOeCpJmPAveGUkAlLTGgAkpv92UnekOTGkKaYHVVySRsetgbMXWTcJDXfRVdwLuBDw
2yY37dxegu/T5rYCb0F0CcfGPqmoL8B7gNODCuAP1j2VyBj68zG1G1gVIklZGLbdoGumW2s/9W6uj+zXy32VH
/vnfArYBOzsH/e6/9foAvr/9E3nF8D+PCKvvwhJGnGcUkaHZ8IkD7crMcBFM3vaRjYPZ6YThBb4f4FILj6Vqxwp4ysdvwV6DMBL
EeHdVTSx/2ZK0ftlNRZ/uAw5Lm1JZRm1DmLbHwHumumRm/fOPSHKUBjVH4yVGbgXYxLqr6LbPEhyxUpRbqR/IHs
f4EOJ+uZfupwBvoup+c3Q/QPB94wEFs+/wkjwZmk1yzZ3X3wa8F/LVb8krUqRfNnHvc1sFXZv5XAPD3S
f4EOJ+uZfupwBvoup+c3Q/QPB94wEFs+/wkjwZmk1yzZ3X3wa8F/LVb8krUepqtY1SJIkSeuS3VQkSZKRgzjkiRJjRjGJ
Rw7gkSZLUiGFckiRJasQwLkmSJDViGJckSZIajfz/eUKQj/LnW4IAAAAASUVORK5CYII=",
"text/plain": [
"<Figure size 864x576 with 1 Axes>"
]

```
      },
      "metadata": {
       "needs_background": "light"
      },
      "output_type": "display_data"
     }
    ],
    "source": [
     "popular_genres = genre_counts.head(5).index\n",
     "\n",
     "df_popular_genres = expanded_joined_df[expanded_joined_df['genre'].isin(popular_genres)]\n",
     "\n",
     "# Box plot of ratings for popular genres\n",
     "df_popular_genres.boxplot(column='averagerating', by='genre', figsize=(12, 8), rot=90)\n",
     "plt.title('Distribution of Ratings for Popular Genres')\n",
     "plt.xlabel('Genre')\n",
     "plt.ylabel('Average Rating')\n",
     "plt.show()"
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "## Initial Data Exploration on the BOM MOVIE dataframe"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 36,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "text/html": [
        "<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>title</th>\n",
        "      <th>studio</th>\n",
        "      <th>domestic_gross</th>\n",
        "      <th>foreign_gross</th>\n",
        "      <th>year</th>\n",
        "    </tr>\n",
        "  </thead>\n",
        "  <tbody>\n",
        "    <tr>\n",
        "      <th>0</th>\n",
        "      <td>Toy Story 3</td>\n",
        "      <td>BV</td>\n",
        "      <td>415000000.0</td>\n",
        "      <td>652000000</td>\n",
        "      <td>2010</td>\n",
        "    </tr>\n",
```

```
        "    <tr>\n",
        "      <th>1</th>\n",
        "      <td>Alice in Wonderland (2010)</td>\n",
        "      <td>BV</td>\n",
        "      <td>334200000.0</td>\n",
        "      <td>691300000</td>\n",
        "      <td>2010</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>2</th>\n",
        "      <td>Harry Potter and the Deathly Hallows Part 1</td>\n",
        "      <td>WB</td>\n",
        "      <td>296000000.0</td>\n",
        "      <td>664300000</td>\n",
        "      <td>2010</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>3</th>\n",
        "      <td>Inception</td>\n",
        "      <td>WB</td>\n",
        "      <td>292600000.0</td>\n",
        "      <td>535700000</td>\n",
        "      <td>2010</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>4</th>\n",
        "      <td>Shrek Forever After</td>\n",
        "      <td>P/DW</td>\n",
        "      <td>238700000.0</td>\n",
        "      <td>513900000</td>\n",
        "      <td>2010</td>\n",
        "    </tr>\n",
        "  </tbody>\n",
        "</table>\n",
        "</div>"
       ],
       "text/plain": [
        "                                         title studio  domestic_gross  \\\n",
        "0                                Toy Story 3     BV     415000000.0   \n",
        "1                   Alice in Wonderland (2010)     BV     334200000.0   \n",
        "2  Harry Potter and the Deathly Hallows Part 1     WB     296000000.0   \n",
        "3                                  Inception     WB     292600000.0   \n",
        "4                        Shrek Forever After   P/DW     238700000.0   \n",
        "\n",
        "  foreign_gross  year  \n",
        "0     652000000  2010  \n",
        "1     691300000  2010  \n",
        "2     664300000  2010  \n",
        "3     535700000  2010  \n",
        "4     513900000  2010  "
       ]
      },
      "execution_count": 36,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "#read the csv file to a dataframe \n",
     "\n",
     "bom_movie_df = pd.read_csv(r'data\\bom.movie_gross.csv')\n",
     "bom_movie_df.head(5)\n"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 37,
    "metadata": {},
    "outputs": [
```

```
     {
      "data": {
       "text/plain": [
        "<bound method DataFrame.info of                                                  title
  studio  domestic_gross  \\\n",
        "0                                    Toy Story 3          BV     415000000.0   \n",
        "1                      Alice in Wonderland (2010)          BV     334200000.0   \n",
        "2     Harry Potter and the Deathly Hallows Part 1          WB     296000000.0   \n",
        "3                                       Inception          WB     292600000.0   \n",
        "4                            Shrek Forever After        P/DW     238700000.0   \n",
        "...                                          ...         ...             ...   \n",
        "3382                                   The Quake       Magn.          6200.0   \n",
        "3383                 Edward II (2018 re-release)          FM          4800.0   \n",
        "3384                                    El Pacto        Sony          2500.0   \n",
        "3385                                    The Swan  Synergetic          2400.0   \n",
        "3386                          An Actor Prepares       Grav.          1700.0   \n",
        "\n",
        "     foreign_gross  year  \n",
        "0        652000000  2010  \n",
        "1        691300000  2010  \n",
        "2        664300000  2010  \n",
        "3        535700000  2010  \n",
        "4        513900000  2010  \n",
        "...            ...   ...  \n",
        "3382           NaN  2018  \n",
        "3383           NaN  2018  \n",
        "3384           NaN  2018  \n",
        "3385           NaN  2018  \n",
        "3386           NaN  2018  \n",
        "\n",
        "[3387 rows x 5 columns]>"
       ]
      },
      "execution_count": 37,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "#more info on the dataset to understand the structure\n",
     "bom_movie_df.info"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 38,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "text/plain": [
        "title              object\n",
        "studio             object\n",
        "domestic_gross    float64\n",
        "foreign_gross      object\n",
        "year                int64\n",
        "dtype: object"
       ]
      },
      "execution_count": 38,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "#Check on the datatypes of each column \n",
     "bom_movie_df.dtypes"
    ]
   },
```

```
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "## Data Cleaning -Handle Missing Values"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 39,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "text/plain": [
        "title               0\n",
        "studio              5\n",
        "domestic_gross     28\n",
        "foreign_gross    1350\n",
        "year                0\n",
        "dtype: int64"
       ]
      },
      "execution_count": 39,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "#check to see if there are any null values\n",
     "bom_movie_df.isna().sum()"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 40,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "text/plain": [
        "title              0.000000\n",
        "studio             0.147623\n",
        "domestic_gross     0.826690\n",
        "foreign_gross     39.858282\n",
        "year               0.000000\n",
        "dtype: float64"
       ]
      },
      "execution_count": 40,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "#check for missing values in the movies_basics dataframe in percentage\n",
     "bomdf_missing_percentage = bom_movie_df.isna().mean() * 100\n",
     "bomdf_missing_percentage"
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "The dataset has missing value in columns : studio, domestic gross, and foreign cost. \n",
     "As *my*  rule of thumb, the columns with mising values that are less than 5%, the rows with
 the missing values will be dropped, as this is will not significantly impact the analysis."
    ]
   },
```

```
{
 "cell_type": "code",
 "execution_count": 41,
 "metadata": {},
 "outputs": [
  {
   "data": {
    "text/html": [
     "<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>title</th>\n",
     "      <th>studio</th>\n",
     "      <th>domestic_gross</th>\n",
     "      <th>foreign_gross</th>\n",
     "      <th>year</th>\n",
     "    </tr>\n",
     "  </thead>\n",
     "  <tbody>\n",
     "    <tr>\n",
     "      <th>0</th>\n",
     "      <td>Toy Story 3</td>\n",
     "      <td>BV</td>\n",
     "      <td>415000000.0</td>\n",
     "      <td>652000000</td>\n",
     "      <td>2010</td>\n",
     "    </tr>\n",
     "    <tr>\n",
     "      <th>1</th>\n",
     "      <td>Alice in Wonderland (2010)</td>\n",
     "      <td>BV</td>\n",
     "      <td>334200000.0</td>\n",
     "      <td>691300000</td>\n",
     "      <td>2010</td>\n",
     "    </tr>\n",
     "    <tr>\n",
     "      <th>2</th>\n",
     "      <td>Harry Potter and the Deathly Hallows Part 1</td>\n",
     "      <td>WB</td>\n",
     "      <td>296000000.0</td>\n",
     "      <td>664300000</td>\n",
     "      <td>2010</td>\n",
     "    </tr>\n",
     "    <tr>\n",
     "      <th>3</th>\n",
     "      <td>Inception</td>\n",
     "      <td>WB</td>\n",
     "      <td>292600000.0</td>\n",
     "      <td>535700000</td>\n",
     "      <td>2010</td>\n",
     "    </tr>\n",
     "    <tr>\n",
     "      <th>4</th>\n",
     "      <td>Shrek Forever After</td>\n",
     "
```

```
"      <td>P/DW</td>\n",
"      <td>238700000.0</td>\n",
"      <td>513900000</td>\n",
"      <td>2010</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>...</th>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>3382</th>\n",
"      <td>The Quake</td>\n",
"      <td>Magn.</td>\n",
"      <td>6200.0</td>\n",
"      <td>NaN</td>\n",
"      <td>2018</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>3383</th>\n",
"      <td>Edward II (2018 re-release)</td>\n",
"      <td>FM</td>\n",
"      <td>4800.0</td>\n",
"      <td>NaN</td>\n",
"      <td>2018</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>3384</th>\n",
"      <td>El Pacto</td>\n",
"      <td>Sony</td>\n",
"      <td>2500.0</td>\n",
"      <td>NaN</td>\n",
"      <td>2018</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>3385</th>\n",
"      <td>The Swan</td>\n",
"      <td>Synergetic</td>\n",
"      <td>2400.0</td>\n",
"      <td>NaN</td>\n",
"      <td>2018</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>3386</th>\n",
"      <td>An Actor Prepares</td>\n",
"      <td>Grav.</td>\n",
"      <td>1700.0</td>\n",
"      <td>NaN</td>\n",
"      <td>2018</td>\n",
"    </tr>\n",
"  </tbody>\n",
"</table>\n",
"<p>3356 rows × 5 columns</p>\n",
"</div>"
],
"text/plain": [
"                                          title      studio  domestic_gross  \\\n",
"0                                Toy Story 3          BV     415000000.0   \n",
"1                  Alice in Wonderland (2010)          BV     334200000.0   \n",
"2     Harry Potter and the Deathly Hallows Part 1          WB     296000000.0   \n",
"3                                   Inception          WB     292600000.0   \n",
"4                        Shrek Forever After        P/DW     238700000.0   \n",
"...                                      ...         ...             ...   \n",
"3382                            The Quake       Magn.          6200.0   \n",
"3383                 Edward II (2018 re-release)          FM          4800.0   \n",
"3384                                  El Pacto        Sony          2500.0   \n",
```

```
        "3385                                  The Swan  Synergetic          2400.0   \n",
        "3386                           An Actor Prepares       Grav.          1700.0   \n",
        "\n",
        "     foreign_gross  year  \n",
        "0        652000000  2010  \n",
        "1        691300000  2010  \n",
        "2        664300000  2010  \n",
        "3        535700000  2010  \n",
        "4        513900000  2010  \n",
        "...            ...   ...  \n",
        "3382           NaN  2018  \n",
        "3383           NaN  2018  \n",
        "3384           NaN  2018  \n",
        "3385           NaN  2018  \n",
        "3386           NaN  2018  \n",
        "\n",
        "[3356 rows x 5 columns]"
       ]
      },
      "execution_count": 41,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "#removing missing value from 2 columns \"studio\" and \"domestic_gross\"\n",
     "bom_mov_clean1 = bom_movie_df.dropna(subset=['studio','domestic_gross'])\n",
     "bom_mov_clean1"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 42,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "text/plain": [
        "title               0\n",
        "studio              0\n",
        "domestic_gross      0\n",
        "foreign_gross     1349\n",
        "year                0\n",
        "dtype: int64"
       ]
      },
      "execution_count": 42,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "#check to see if the missing calues have been removed from the two columns \n",
     "bom_mov_clean1.isna().sum() "
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "The only column left that has missing values is the foreign_gross column with 1,349 values
 missing! That is 40% of the total column of that data as shown in the cell below. \n"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 43,
    "metadata": {},
    "outputs": [
```

```
     {
      "data": {
       "text/plain": [
        "40.19666269368295"
       ]
      },
      "execution_count": 43,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "bom_mov_clean1['foreign_gross'].isna().mean() * 100"
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "Imputing the missing values can be a practical solution. Replace the missing values with a statistical measure either mean or median. \n",
     "1. First, check whether the data in the column Domestic gross is normally distributed or not, to decide whether to use the mean for normal distribution or median imputation if there are outliers/not normally distributed in the foreign gross column. \n",
     "*The assumption been made here is that both values in these two columns are positively corelated and are similar*"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 44,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "image/png":
"iVBORw0KGgoAAAANSUhEUgAAAmoAAAGDCAYAAAACbcTyoAAAAOXRFWHRTb2Z0d2FyZQBNYXRwbG90bGliIHZlcnNpb24zLjMuM
SwgaHR0cHM6Ly9tYXRwbG90bGliLm9yZy/d3fzzAAAACXBIWXMAAAsTAAALEwEAmpwYAAAjvUlEQVR4nO3debxlZX3n+8/XAgV
FVKRAqCooJDgAiaAlwZi+UdGWCLaaWN5HTAXJdIkMS39ikJoJX3DNXYcEpJAGicGByyHjmgkCsQpN7RQGgwytRXGoipQYiuoN
EP56z/WU7Itzzm1C2qf85xTn/frtV9n7Wc9a63f3vvUru9vZxZpxpSVUiSJKk/D5vrAiRJkjjQ1g5okSVKnDGqSJEmdMhGqSJEmdMqhJkiR1yqA
mSZLUKYOaJElSpwxq0nYiYiV8n+c/baF37JPlBkkkXt+ZeSvG5brLut78Ikx2yr9W3Fdv84yXeS/Otsb3uSkpyc5H1zXYekrRevo
ybNf0luBPYE7gc2AlcD5wJnVdWPH8S6/ldVF2FMl8ZeCPl92WkiwD/iewb1XdPsX85wB/D/yoNX0P+Ef
gT6vq8tmpcstanR+qqqVzXIqbAnA9aatLC8etV9WhgX+BPgDcD79/WG0yw7ZeZyf6YKqSNWFdVuwCPBg4HrgW+muSI2I2G/Hb8b/yS
wv49OKaUwY1aYGpqu9X1QXAy4FjGJK8M2m3uJXJ0/JnvJYkcyCbnN0vj/0lmYTN0/ZyYHfNfZH1o/mnPp/Xdas8dA1RYPEpr2fn/tVfRwPXBgeXZzHGmHelJKzGZM/buAJo4Vf3oR1Sqcfhmdmb4ghwWUO8YdzQ2s+1
uTnJXkluT/KckjwIuHHkdP0iyd5JTk3w6ZgSXoRrzRuf5BOpR4n7Xdv43YsgADcgbPzHWj2dCXbRiKVWbz
evlGIZ2PCSGffedNFBEdUJPUsutRwWuFuwzRzHCIkJ6zU0PeyoiFWw5nSVSdEoYQKr7Kcx2wgI8jLjqPhn7CL1onyh9Ti5B/pq2Lg61JPMy/dsNfX
cC7gb9N8viR/iuBVwMvA2ih6yLgI8Ic11a4nYMWqQ9hxN2CU6ee+ltA1F6xk9z
w/wEfa9t72hTdXtsezwBf0XxOpCrzVKBDDN4t5xSxfb0LM2fWZ9ndqgMLsLsJi9vRyyrOMBfRqTibMDuVXL/zVOh6e/zk4J2GpOATEYBJUmRtSsHpH9ZC81xqBYx7d3oJFdlcQXg/PgaUpWLcprP32VqDk6F8PrPt8F9/gkNmCdgpkULfU1Nnz/l4IYn9tdPnPS8BNJZn
8ig4D36VJXx8TtHbRsBSssEPrxfh+AhwI4VgFQojbbA9zVvZyuMM3rI
SDM0H+7VzvSe0WXmQ1F6P3e1+V0H0OnuKsP8IZwlKq8ui+9wxhC0ZFI+aGvTEwn4wSHlopB8j4+vfU4lV8ea0rwqw1W/Yik9vojGG7WgMeXvJumBDaIP1pcCMjoDqdkg9SVTHkVkZuYhJYJW7xKyp0BrSrjzH7t2D+RZEDZKrHMxnkN1vFnuqOUvYVE6dGI0Rhb2V9ZOHYp0W3tzp+QL0phc1rEGQomNXHAVXntWkWiepZqGKz+d+j7hkHyQ3qsNA6QqHSCxfOE1d2KPNxXn/JBxYzCJHI4XMk/EAuXDMYJYHP3grVJtB8oBAHr4XZSdTXr3sIa8UUbUTHqzXoRMPFI7tUXw6FB7Lkc1Oamh4+G7o5/VoFKEaR8M7rrp8vfd2dvH7yCbsG1YLc19Nk8M5vzlSJf7ysMnaJTsjDbkgIwrjqF3U6YjZBaYWYYdqDTJfHxzJHFmGC9a7tu6a1sSq8dvHAUBzhLUb+ln7p/w+lCy9y6xVuq2fPmkUnAW01Pcst4UtMLShzWTfdGmcRSm1iwz8UpO1JfAfTJYwwknC93Nwn4ucjnxlHc4zCG5qM21iD4Fx/JQmT9G+4wGGkeWBoF94eZFM9cqwAZ9Hdx+fdHzfgPVRn8EbWsGHlhiBEeVUyV5yDMPvFu3Zh7l0fXbZR+Ts7gu5OGLNW6JbMgjuFW2yxbSMXY/9HHVXZWbvvOjQJJD3UpjQeXnQlIlj8MHJgqj/vzZzRDpUTnuiO2M06/KFM99DgR37VpfTFSX/Z4Y8DtBUAwKZgxmNfsw/59VLYL4EyhnPhZcUHgBu+VXxrzTHxrWqu8oFxU9Jx+UIkdDvUYOo0bgg/jpSO/bY4oazGwbqiTbYAS0Xtlx+Gd+L7YgQIB1b4HeeBaq5btXrpUr3TMJfH6yI1BfZAI9m7NSU3b6oVA8bAJtuyzQz6W7Dw4drDDDGPXp7GJM2gHqNV9uHx/OzenJbhy7pdDKldTKtRyBFs3I5jy9gDPYAkf7T7n5nnvsNDtCB0mBzTRi1FwZy+GNL0znnUPXAOXv/HFxfb7cA6k8unO8UhzRpB0aWJKjt6ZT6p1ItkfdYtZndtH0z85zP8nJqiuNjnHR6jTpIe9vfWS2+iizgJoNHoi2fHkyI6DfGn5iMDxnewGbvOQlTV6dO1/+1JDKR7uYNjwA7/AuE3ORFgIAEoXDCCQaYMuYQm6Ehtiss73Wa4bL0uu6MGRvzZv6pxqPSN1yUaUz3YNdzbCsqS3Tvxbhlr75EHz4KfmIMNRwRxMUEX0EY5TUeDq30ywmZ8LNjfSz9h2Bt2jx3HZwpChxkgNB6a+LZdtfdcYFkQ+Nzv/TD/5udUj6IU3vn21cvi7CEs4mgWrsRV/0TSibJIXrAR4bwjYRldJBzxF/T2zG08IafCOdWd/jp/cGyUBzHsXmOBuSGwKSBuWBVb2yDzN0EN5+Fv1YUxGvLxY2uJHqMFkB1yq9j3G2uBKywnCQBrk16P5KhB5AFCnq2YcBfy/1Zh3yIwzZsGMMAYRkgoBiAh9qF2g
```

R+19t2SXJTk2+3n40aWOSnJmiTXJXnhSPszklzZ5p2eJJOqW5IkqReT3KN2D/C8qnoacAhwZJLDgbcAl1TVAcAl7TlJDgRWAgc
BRwJnJFnU1nUmcBxwQHscOcG6JUmSujCxoFaDH7SnO7ZHAUcD57T2c4CXtOmjgfOr6p6qugFYAxyWZC9g16q6tKoKOHdkGUmSp
AVroseoJVmU5ArgduCiqvoasGdVrQdoP/do3ZcAt4wsvra1LWnTm7dPtb3jkqxOsnrDhg3b9LVIkiTNtokGtaraWFWHAEsZ9o4
dPEP3qY47qxnap9reWVW1oqpWLF68eKvrlSRJ6smsnPVZVd8DvsRwbNltbTiT9vP21vsRwbNltbTiT9vP21m0tsGxksaXAuta+dIp2SZKkBW2SZ30uT
vLYNr0z8HzgWuAC4JjW7Rjg0236AmBlkkck2Y/hpIHL2vDoXUkOb2d7vmZkGUmSpAVrkhe83Qs4p525+TBgVVV9NsmlwKokxwI
3Ay8DqKqrkqwCrgbuB06oqo1tXccDZwM7Axe2hyRJ0oI2saBWVf8MHDpF+x3AEdmscxpw2hTtq4GZjm+TJElacLwzgSRJUqcMa
pIkSZ0yqEmSJHXKoCZJktQpg5okSVKnDGqSJEmdMqhJkiR1yqAmSZLUKYOaJElSpwxqkiRJnTKoSZIkdcqgJkmS1CmDmiRJUqc
MapIkSZ0yqEmSJHXKoCZJktQpg5okSVKnDGqSJEmdMqhJkiR1yqAmSZLUKYOaJElSpwxqkiRJnTKoSZIkdcqgJkmS1CmDmiRJU
qcMapIkSZ0yqEmSJHXKoCZJktQpg5okSVKnDGqSJEmdMqhJkiR1yqAmSZLUKYOaJElSpwxqkiRJnTKoSZIkdcqgJkmS1CmDmiR
JUqcMapIkSZ0yqEmSJHXKoCZJktQpg5okSVKnJhbUkixL8sUk1yS5KskbW/upSW5NckV7vGhkmZOSrElyZXIXjrQ/I8mVbd7pS
TKpuiVJknqxwwTXfT9wYlV9I8mjga8nuajNe8nuajNe09VvXO0c5IDgZXAQcDewMVJnlRVG4EzgeOA/wF8DjgSuHCCtUuSJM25ie1Rq6r
1VfWNNn0XCA2wZIZFjgbOr6p6quoGYA1wWJK9gF2r6tKqKuBc4CWTqluSJKkXs3KMWpLlwKHA11rT7yT55yQfSPZCKPSFK4TXTvZ9a0
bWtbUmb3rxdkiRpQZt4UEuyC/BJ4Per6k6GYcz9gUOA9cC7NnWdYvGaoX2qbR2XZHWHS1Rs2bHiopUuSJM2piQa1JDsyhLQPV9W
nAKrqtqraWFU/Bt4LHNa6rwWWjSy+FFjX2pdO0f4zquqsqlpRVSsWL168bV+MJEnSLJvkWZ8B3g9cU1XvHmnfa6TbS4Fvek
JVJHpFkP+AA4LKqWg/cleTwts7XAJ+eVN2SJEm9mORZn88GXg1cmeSK1nYy8Ioh3xkcmSK1nYy8IokhzAMX94I/DZAVV2VZBVwNcMZoye0Mz4Bjgf
OBnZmONvTMz4lSdKCN7GgVlX/wNTHl31uhmVOAO06bon01cPC2q06SJKl/3plAkiSpUwY1SZKkThnUJEmSOmVQkyRJ6pRBTZIkq
VMGNUmSpE4Z1CRJkjplUJMkSeqUQU2SJKlTBjVJkqROGdQkSZI6ZVCTJEnqlEFNkiSpUwY1SZKkThnUJEmSOmVQkyRJ6pRBTZI
kqVMGNUmSpE4Z1CRJkjplUJMkSeqUQU2SJKlTBjVJkqROGdQkSZI6ZVCTJEnqlEFNkiSpUwY1SZKkThnUJEmSOmVQkyRJ6pRBT
ZIkqVMGNUmSpE4Z1CRJkjplUJMkSeqUQU2SJKlTBjVJkqROGdQkSZI6ZVCTJEnqlEFNkiSpUwY1SZKkThnUJEmSOmVQkyRJ6pR
BTZIkqVMGNUmSpE5NLKglWZbki0muSXJVkje29t2SXJTk2+3n40aWOSnJmiTXJXnhSPszklzZ5p2eJJOqW5IkqReT3KN2P3BiV
T0VOBw4IcmBwFuAS6rqAOCS9pw2byVwEHAkcEaSRW1dZwLHAQe0x5ETrFuSJKkLEwtqVbW+qr7Rpu8CrgGWAEcD57Ru5wAvadN
HA+dX1T1VdQOwBjgsyV7ArlV1aVUCO7IMpIkSQvWrByjlmQ5cCjwNWDPqloPQ5gD9mjdlgC3jCy2trUtadObt0uSJC1oEw9qS
XYBPgn8flXdOVPXKdpqhvaptnVckpdptnVcktVJVm/YsHri5UkSerIRINakh0ZQtqHq+pTrfm2NpxJ+3l7a18LLBtZfCmwrrUvnaL9Z1T
VWVW1oqpWLF68eNu9EEmSpDkwybbM+A7wfuKaq3j0y6wLgmDZ9DPDPDpkfaVSR6RZD+GkwYua8OjdyU5vK3zNSPLSJIkLVg7THDdz
wZeDVyZ5IrWdjLwJ8CqJMCNwMvA6iqq5KsAq5mOGP0hKra2JY7Hjgb2Bm4sD0kSZIWtIkFtar6B6Y+vgzmNWMvA6iqq5KsAq5mOGP0hKra2JY7Hjgb2Bm4sD0kSZIWtIkFtar6B6Y+vgzgiGmWOQ04bYr21cD
B2646SZKk/nlnAkmSpE4Z1CRJkjplUJMkSeqUQU2SJKlTBjVJkqROGdQkSZI6ZVCTJEnqlEFNkiSpUwY1SZKkThnUJEmSOmVQk
yRJ6tRYQS2J99mUJEmaZePuUfvrJJcl+Q9JHjvJgiRJkjQYK6hV1S8DrwS8JCyZamSRJ0nZu7GPUqurbwCnAm4FfAU5
Pcm2Sfzep4iRJkrZn4x6j9gtJ3gNcAzwP+PWqemfbs8MkSdpu7TBmv78E3E3gucXFV3b2qsqnVJTplIZZIkSdu5cYPai4C7q
2ojQJKHATtV1Y+q6ryJVSdJkrQdG/cYt/cYtYuBnUeeP7K1SZIkaULGDWo7VdUPNk206UdOpiRJkiTB+EHth0mevulJkmcAd0+mJEmSJEH4x6j9AS+fSEWSJEkcCxgxqxqXVXV5kqkqcAcc/6/BBwhEkWIkmSpJ827h613YGrk1wG3LOpsapePJGqJEmSNHZQO3O3W
SRUiSJOlnjXt5ji8n2Rc4oKouvTvJIYNFkS5MkSdq+jXWMWpLXA58A/A58A/ltrWgL8zYRqkiRJEuOfTHAC8GzGzToCq+jawx6SKkiRJ0
vhB7Z6qunfTkyQ7ANGFxHTZIkSRMyblD7cpKTgTZ2TvAD4OPOPCZyZUlSZKkcYPaW4ANwJXAbw4wANAwNwJXAbwOfA06ZVFGSJEka/6zPHWPwbQ9O
NgnHv9XkDUxyTVlVPSZIkCdi6e31ushPwMmC3bV+OJEmSnhnrGLWquoehWqumPkctWtV/RnwvMmWJkStH0bd+wJz6SNPH8awh+3RE
6lIkiRJwPhDn+8amb4fuBH4t+8eqUzt5ghlLM+nzvpQiRJkvTTxh36fNM86vq3HMVPs8wHgKOD2dxjaZaW3LlNmmmAJ1fV59q
8k4BjgY3A71XXV51v7M4CzgZZrt/2xqryqrgiSJGnBG/eCtyuA4eExrgxeEAnWIMnxatAdq3q4Y2cOQU7e+pqkPaY1NIOxBYCRzUl
jkjyaLW/0zgOO9ph6qnZIkSQvOuMeo7Q48+varugp/sGft4Vb1uugWb/qG9qB05+5/qOB86vqHuCGJGuAAw5LcSAS
4cMz1SpIkzVvj7lhbB7h35Pm9wPIHsHC3uf9tQ6/HsiEHtbQlwy0CCPD9sYb6hl5HGtbQlwy0iftTyw927tF01TSnJcktVJVm/YsGG6bpIkSfPCuEHtPOCyJ
KcmeRvwKOXRvwNeDcB7G9M4H9gGkTuK6EcddneOqOmTrlxdanhju6/I2nvlwE
Bz7ana4FlI12XAuta+9Ip2iVJkha8cfeoATwsuLOq/hxYm2S/h2dmbfuHAJdV1XrgriSHJFwwnguDTW
7tdSZKk+Wjcy3O8jeHMzycDHwR2BD7EcNYngHk2BQZ4ayPZD4EPLB3FMGDTRR5SPRRPhycLx44vaIKsLuvCx6KyCyxx2UPVOdSh5lxUgLqHEdtu2e4E8
kkCRJ24lxz/p8KXAo8A2AqlqX5NFTL8u4kBS1E0SiXyvhP/p3AQTxBG+hPkXPi8kiKhnhrfoHGcxfnAzrWZZbSFXVK6Zof8M/U8DTpuifTVw8Jh1SpIkLRjjDn3e2y0y4wWBJHjbTZ+4y4mBJHjW5kiRJkgTjB7VVSf4b8Ngkrwcvb8
NgkrwcuBt47ubIkSZK0xaHPdhD/x4CnAHcyHKf21qq6aMK1SZIkbde2GNSqpqqpL8TVU9AzCcSZIkzZJxhz7/R5JnTrQSSSIk/ZR
xz/p8LvCGdu/NHzLcMaCq6hcmVZGkSdL2bsaglmSfqroZ+NVZqkeSJEnNlvao/Q3w9Kq6F/lvHsKkckkqnq+o3ZqEmSZIkseVj1EZviv7ES
RYiSZKkn7aloFbTTEuSJGnCtjT0+bQkdu5TcMDJxPsOtHqJEmStmMzBrWqWjRbhUiSJOmnjXXsdNUmSJM0yg5okSVKnDGq
SJEmdMqhJkiR1yqAmSZLUKYOaJElSpwxqkiRJnTKoSZIkdcqgJkmS1CmDmiRJUqcMapIkSZ0yqEmSJHXKoCZJktQpg5okSVKnD
GqSJEmdMqhJkiR1yqAmSZLUKYOaJElSpwxqkiRJnTKoSZIkdcqgJkmS1CmDmiRJUqcMapIkSZ0yqEmSJHXKoCZJktQpg5okSVK
nDGqSJEmdMqhJkiR1yqAmSZLUKYOaJElSpyYW1JJ8IMntSb0rZbkouSfLv9fNzIvJOSrElyXZIXjrQ/I8mVbd7pSTKpmiVJk
noyyT1qZwNNHbtb2FuCSqjoAuKQ9J8mBwErgoDEBErgoLbMGUkWtWMGUkWtWXOBI4DDDmiPzdcpSZK0E0IE0sqFXVV4DvdvzbtZ8NHBOmz4HeMlmI+/lVdU9
V3QCsAQ5Lshewa1VdWwa1VdWlUFnDuyjCRJ0oI228eo7VlV6VvWHazz1a+xLglpF+a1vbkja9efuUkhyXZHWS1Rs2bNimhUuSJM22Xk4mm
Oq4s5qhfUpVdVZVraiqFYsXL95mxUmSJM2F2Q5qt7XhTNrP21v7WmDZSL+lwOl2Ls4vzSvUPGGt9O0+GR4lpp3+k9S5yFWpJ5s
JfgwnDVzWhkfvSnJ4O9vzNSPLSJIkLWg7TGrFST4rPAfyP84g4KPAfYPcla4G3Ac5IcwkhwL3Ay8DKCqrkqwCrgauB84oao2tlUdD3B84oao2tlUdz3AG6c7Ah
e0hSZK04E0sqFXVK6aZdcQ0/U8DTpuifTVw8DYsTZIkaV7o5WQCSZIkbcagJkmS1CmDmiRJUqcMapIkSZ0yqEmSJHXKoCZJktQ
pg5okSVKnDGqSJEmdMqhJkiR1yqAmSZLUKYOaJElSpwxqkiRJnTKoSZIkdcqgJkmS1CmDmiRJUqcMapIkSZ0yqEmSJHXKoCZJk
tQpg5okSVKnDGqSJEmdMqhJkiR1yqAmSZLUKYOaJElSpwxqkiRJnTKoSZIkdcqgJkmS1CmDmiRJUqcMapIkSZ0yqEmSJHXKoCZ
JktQpg5okSVKnDGqSJEmdMqhJkiR1yqAmSZLUKYOaJElSpwxqkiRJnTKoSZIkdcqgJkmS1CmDmiRJUqcMapIkSZ0yqEmSJHXKo
CZJktSpOQlqSW5McmWSK5Ksbm27Jbkoybbfbz8eN9D8pyZok1yV54VzULEmSNvmco/ac6vqkBZ0/6/Bbikqg4ALmnPSXIgsBI
4CDgSOCPJorkoWJIkaTb1NPR5NHBOmz4HeMlI+/lVdU9V3QCsAQ6b/fIkSZJm11wFtQK+kOTrSY5rbXtW1XqA9nOP1r4EuGVk2bW
bWt7WckOS7J6iSrN2zYMHSHSJUmSZscI7TdZ1fVuiR7ABclufbn+maKtpuw4hbA7ztsyT9fp2PmWEV4wzAa7ZdtgdfDH3xH1JiSUNUUEr6xEw+T8kbsO38jQr3y3D4vyI2n26c86HFDFArzTjnG+APH3mRQ8B1LNbsFrSKa1ePSuhr1xkcqeopNKuP5dN5
ggLCM8s7tk7G+fOapc5ek4nlHwG/QnjJbeHB7f+RlsMEDYR2sAl2r7hKibcqlsWA5YlVtRY8jBC0V4QcStyTKSVm9PdYZqvRdDxKuMRW7d4EAuRkFk7sS8dxDm3NtbBenwKeNKlh5BkIKAMngwWjmhtdpcnObcxoJSbs0Tcg
qgBhwFrqup6gCTnA0cBJtXbXLpptkKPkCBfgpne+1NApSQ/CfAlqS4BbRp6vBX5XjmqRtLUMnd1Z9PCd2Hjv/57rMrYJw7MWslTVXNe
wRUleBrywql7Xnr8fscBx7WnTwaum3BpuwPfmfA2tO34ec0ekOEfmbzi5/X/OLn1Zd9q2rx5o3zZY/aWmDZyPOlwLrNO
1XVWcBZs1VUktVVtWK21qetw89r/vDzmj/8rOYHP6f5w89q/ujxs5qroY9rgWUjz5cC6+aoFkmSpC7NVVC7HDggyX5JHg6sBC6Yo1okSZK6NCdDn1V1f5LfAT4PLAI+UFVXzUUtm5m1YVZtE35e84ef1/zhZzU/+DnNH35W80d3n1Wqfu7QMkmSJHWgpzsTSJIkaYRBTZIkqVMGtSbJkUmuS7ImyVvmuh5NLcmyJF9Mck2Sq5K8ca5r0vSSLEryzSSfmetaNL0kj03yiSTXtt+tX5rrmjS1JL/f/vZ9K8lHk+w01zVpkOQDSW5P8q2Rtt2SXJTk2+3n4+ayRjCoAcOXCvAXwK8BBwKvaPceVX/uB06sqqcChwMn+Fl17Y3ANXNdhLboz4G/q6qnAE/Dz6xLSZYAvwesqKqDGU7EWzm3VWnE2cCRm7W9Bbikqg4ALmnP55RBbXAYsKaqrq+qe4HzgaPnuCZNoarWV9U32vRdDF9IS+a2Kk0lyVLgxcD75roWTS/JrsBzgPcDVNW9VfW9OS1KM9kB2DnJDsAj8Rqj3aiqrwDf3az5aOCcNn0O8JLZrGkqBrXBEuCWkedr8cu/e0mWA4cCX5vjUjS1PwPeDPx4juvQzJ4IbAA+2Iap35fkUXNdlH5WVd0KvBO4GVgPfL+qvjC3VWkL9qyq9TDsaAD2mON6DGpNpmjzuiUdS7IL8Eng96vqzrmuRz8tya8Bt1fV1+e6Fm3RDsDTgTOr6lDgh3QwPKOf1Y5vOhrYD9gbeFSSV81tVZpvDGoDb2k1jyTZkSGkfbiqPjXX9WhKzwZ+PcmNDIcTPC/Jh+a2JE1jLbC2qjbtmf4EQ3BTf54P3FBVG6rqPuBTwLPmuCbN7LYkewG0n7fPcT0GtcZbWs0TScJwLM01VfXuua5HU6uqk6pqaVUtZ/h9+vuq8j//DlXVd4Bbkjy5NR0BXD2HJWl6NwOHJ3lk+1t4BJ740bsLgGPa9DHAp+ewFmCObiHVm45vaaWf9Wzg1cCVSa5obSdX1efmriRp3vtd4MPtn9Trgd+c43o0har6WpJPAN9gOAP+m3R4i6LtVZKPAr8C7J5kLfA24E+AVUmOZQjaL5u7CgfeQkqSJKlTDn1KkiR1yqAmSZLUKYOaJElSpwxqkiRJnTKoSZIkdcqgJmlBSfKYJOcm+Zf2ODfJYx7C+g5J8qJtWaMkjcugJmmheT9wfVXtX1X7Azfw0G46fwhgUJM0JwxqkhaMJD8PPAN4x0jz24EVSfZP8itJPjPS/78kee0U63l/kq/+r3bun7WmOYrj+PudEGU4k1VXdBJ1eXUvWZRQdCpmLJprI4wu+vjSv4LdfHlx4Vw1N7fTunqnaVWpMPx5d5ddVbBM8MwzzPgSm0cLjuwy8pWKfqwj9ewdfYJ+DcApZ01k50CsiTX9vhYLv9n+18/dnGtsR16N4DBO2MBc5lqq+C+0+9rOPm8cGc+fPR57ds4RMhM4sSjL4VsVzkVXZ/HVKu8MyL3yDv9+3eq9tHl/Y+I1//I2J5+/BhvAAAAAElFTkSuQmCC

VHJclSZI0UfMiqAFU1eeAz811HZuZtWFWbRN+XvOPn9n84uc1v/h5zQPz4mQCSZKk7dF8OUZNkiRpu2NQe5C8pdX8kWRZki8mu
SbJVUneONc1acuSLEryT0kWxgXYFrgkj03yiSTXtn9rz5rrmjS9JP+xfR9+K8lHk+w01zVpaga1B2Hklla/ChwIvCLJgXNblWZ
wP3BiVT0VOBw4wc9rXngjcM1cF6Gx/Tnwd1X1X1FOBp+Nl1K8kS4PeAFVV1MMNJeivntipNx6D24PzkllZVdS+w6ZW6lBVra+qb
7Tpuxj+A1kyt1VpJkmWAr8GvG+ua9a9GWJdkV+L+A9wNU1b1V9b05LUpbsgOwc5IdgEcyxbVJ1QeD2oMz1S2t/I9/HkiyHDgU+No
cl6KZ/RnwB8CP57P57gOjeeJwAbgg224+n1JHjXXRWlqVXUr8E7gZmA98Pz2ZhA98P2q+sLcVqXpGNQenKlu9Olu5Os51LsgvwSeD3q+rOua5HU
0tyFHB7VX19rmvR2HYAng6cWVWHAj8EPHa3U0kexkezAKtB+wN/CoJK+a26o0HYPagzPWLa3UjyQ7Q7MoS0D1fVp+a6Hs3o2cCLk9z
IcFjB85J8aG5L0hasBdZW1aY91Y1Z9gCG7q0/OBG6pqQ1XdB3wK+KU5rknTMKg90N7Sah5JEeZ0ZjZ66pqnfPdT2aWVWdVFVLq2o5w
7+tv68q/9rvWFX9K3BLkie3piOAq+Kie3piOAq+ewJM3sZuDwJI9s349H4Mkf3Zo3dyboibe0mneeDbwauDLJFa3t5Ha3C0nbxu8CH25/vF4
P/NYc16NpVNXXknwC+AbDWfH/hHcp6JZ3JpAkSeqUQ5+SJEmdMqhJkiR1yqAmSZLUKYOaJEaJElSpwxqkiRJD1KSDySmS5Pcm3xui7T
5Ivtjt4/HOSF21pGYOapC4l2ZjkiiRXJflmkjclXmlXFXvrCSHHjH6ZJnlvxkrGvup9klyRvjlRZMvXeKjSvn0ykLmdWsRtUE62cutUFKYOaJElSpwxqkiRJD1KSDySmS5Pcm3xui7T
V7uCxEjhjSwsY1CT16u6qOqSqDgJeALwIeNsc1HFI2zYAVBVf3JViz/PuB/AQe0L+cjgd0275Rk0UOsU9IcqKqvAN8dbUuyf
5K/a3+YfTXJUzZ1B3Zt049hjLsaeR01SV1K8M8lrgJQXoj4YeBfwIYLHt8DvKi
qvptkf+CvgXMXAj4DXV9W1SV7GmbQ/TpXAT8XPXAT8XFX9ZzA3mkzynbW89Q
yB8+jSv6yDgg+21PAz4DYYv+FUMt7BbBPy/VfWxrXmJW0bSZYDn62qg9qvg9qrX9fPtL9QtJntS6HgwcCuzEELLeXFWHJkP8Brgzxiuwj76JXoG8DzgrcALq+rWJI+mmXDlzr2N2aBArAG
NzkdODLVfXStkdsF37aQCA3pwppIw4DDq6GQ5KcOM3regPw51W1xn16qr1rdT1m/HdT0qQk2YXh+7QB+Q8XAK
8Aji7qt6V5nFnAeUkOnuk7wqAmaT7Z9K33Q8K33y8BfALQ9YTcBm4LaF6vqLuCuJN8HPHPrwR+YQtfov8/cHaSVQw3t6S5z1fq
1646YtP/hB4GbBHVe3dmi+rqhu28LouBoBf4wyVLgUy1gXgm8M8k7GP6S/+oY9UqavIcB36uqZ6q6aYdyzteLaqujTJgyjBLfPtDJ
J6l4b+tzI8IWWGbreMzL945HnP2b44/QnX6Ijj6cCVNUbGA72XQZCkeTxD7Hsq4GnbToJoqpOa1a/eu470+eHI9JSvq6o+ArwYu
Bv4fJLnVdX/BJ7BEEEDf3vb8SZpjVXUncEM7lIIMntZm3wwc0dqfyrDnf8NM6zO0SepeksUMx4L9ZQ0H1n4FeGH+C6cdY
105dokv2r6mtV9VbgOwyB7S7g0dOs7hg7hLg+LbsoiSjAYyqWgOsBv5408kC3o0kC7S/o6YLmlK+rhdTrq+p04AKGCPYN7Az+qqg8B72Q4v
k3SLEvyUYa93k9OsjbJ9Oz/jo9N8k3gKuDPWt/aPaa2sLJws49CmpVzsnuQLYkeHA+v0Ad7d5ZwB/3Yb/7mf4srtnZCh
zS14JnJnklLb+84FvAn+a5E5Ear5e2breeNwFnti3kjQ2i7dLM+rwP+FFiT5LsMe8XePE1d072ulwOvSnIf8K/Af
wGe2er9MXBf27akWVVr5hm1s9csqOqrgaevTXr96xPSZKkTjn0KmCmDmiRJUqcMapIkSZ0yqEmSJHXKoCZJktQpg5okSVKnDGqSVK
nDGqSJEmdMqhJkiR16v8A+9ES/L1mCmgAAAAASUVORK5CYII=",
      "text/plain": [
       "<Figure size 720x432 with 1 Axes>"
      ]
     },
     "metadata": {
      "needs_background": "light"
     },
     "output_type": "display_data"
    }
   ],
   "source": [
    "\n",
    "# plot histogram \n",
    "plt.figure(figsize=(10, 6))\n",
    "plt.hist(bom_mov_clean1['domestic_gross'],bins=10, edgecolor=\"black\")\n",
    "plt.title(\"Distribution of Domestic gross\")\n",
    "plt.xlabel(\"Domestic Gross\")\n",
    "plt.ylabel(\"Frequency\")\n",
    "plt.show()\n"
   ]
  },
  {
   "cell_type": "markdown",
   "metadata": {},
   "source": [
    "Using the domestic gross as a case study to see how the foreign gross is distributed, there is an uneven distribution, hence use the median as the imputation techniques for the foreign gross. "
   ]
  },
  {
   "cell_type": "code",
   "execution_count": 45,
   "metadata": {},
   "outputs": [
    {
     "name": "stderr",
     "output_type": "stream",
     "text": [
      "<ipython-input-45-e3fe964af55c>:3: SettingWithCopyWarning: \n",
      "A value is trying to be set on a copy of a slice from a DataFrame.\n",
      "Try using .loc[row_indexer,col_indexer] = value instead\n",
      "\n",
      "See the caveats in the documentation: https://pandas.pydata.org/pandas-

```
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy\n",
      "  bom_mov_clean1[\"foreign_gross\"] =
pd.to_numeric(bom_movie_df['foreign_gross'],errors=\"coerce\")\n",
      "<ipython-input-45-e3fe964af55c>:9: SettingWithCopyWarning: \n",
      "A value is trying to be set on a copy of a slice from a DataFrame.\n",
      "Try using .loc[row_indexer,col_indexer] = value instead\n",
      "\n",
      "See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy\n",
      "  bom_mov_clean1['foreign_gross'] =
bom_mov_clean1['foreign_gross'].fillna(median_foreign_gross)\n"
     ]
    },
    {
     "data": {
      "text/html": [
       "<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>title</th>\n",
       "      <th>studio</th>\n",
       "      <th>domestic_gross</th>\n",
       "      <th>foreign_gross</th>\n",
       "      <th>year</th>\n",
       "    </tr>\n",
       "  </thead>\n",
       "  <tbody>\n",
       "    <tr>\n",
       "      <th>0</th>\n",
       "      <td>Toy Story 3</td>\n",
       "      <td>BV</td>\n",
       "      <td>415000000.0</td>\n",
       "      <td>652000000.0</td>\n",
       "      <td>2010</td>\n",
       "    </tr>\n",
       "    <tr>\n",
       "      <th>1</th>\n",
       "      <td>Alice in Wonderland (2010)</td>\n",
       "      <td>BV</td>\n",
       "      <td>334200000.0</td>\n",
       "      <td>691300000.0</td>\n",
       "      <td>2010</td>\n",
       "    </tr>\n",
       "    <tr>\n",
       "      <th>2</th>\n",
       "      <td>Harry Potter and the Deathly Hallows Part 1</td>\n",
       "      <td>WB</td>\n",
       "      <td>296000000.0</td>\n",
       "      <td>664300000.0</td>\n",
       "      <td>2010</td>\n",
       "    </tr>\n",
       "    <tr>\n",
       "      <th>3</th>\n",
       "      <td>Inception</td>\n",
       "
```

```
"      <td>WB</td>\n",
"      <td>292600000.0</td>\n",
"      <td>535700000.0</td>\n",
"      <td>2010</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>4</th>\n",
"      <td>Shrek Forever After</td>\n",
"      <td>P/DW</td>\n",
"      <td>238700000.0</td>\n",
"      <td>513900000.0</td>\n",
"      <td>2010</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>...</th>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"      <td>...</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>3382</th>\n",
"      <td>The Quake</td>\n",
"      <td>Magn.</td>\n",
"      <td>6200.0</td>\n",
"      <td>19600000.0</td>\n",
"      <td>2018</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>3383</th>\n",
"      <td>Edward II (2018 re-release)</td>\n",
"      <td>FM</td>\n",
"      <td>4800.0</td>\n",
"      <td>19600000.0</td>\n",
"      <td>2018</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>3384</th>\n",
"      <td>El Pacto</td>\n",
"      <td>Sony</td>\n",
"      <td>2500.0</td>\n",
"      <td>19600000.0</td>\n",
"      <td>2018</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>3385</th>\n",
"      <td>The Swan</td>\n",
"      <td>Synergetic</td>\n",
"      <td>2400.0</td>\n",
"      <td>19600000.0</td>\n",
"      <td>2018</td>\n",
"    </tr>\n",
"    <tr>\n",
"      <th>3386</th>\n",
"      <td>An Actor Prepares</td>\n",
"      <td>Grav.</td>\n",
"      <td>1700.0</td>\n",
"      <td>19600000.0</td>\n",
"      <td>2018</td>\n",
"    </tr>\n",
"  </tbody>\n",
"</table>\n",
"<p>3356 rows × 5 columns</p>\n",
"</div>"
],
"text/plain": [
"                                          title      studio  domestic_gross  \\\n",
"0                                Toy Story 3          BV     415000000.0   \n",
```

```
        "1                      Alice in Wonderland (2010)          BV     334200000.0   \n",
        "2     Harry Potter and the Deathly Hallows Part 1          WB     296000000.0   \n",
        "3                                       Inception          WB     292600000.0   \n",
        "4                            Shrek Forever After        P/DW     238700000.0   \n",
        "...                                          ...         ...             ...   \n",
        "3382                                The Quake       Magn.           6200.0   \n",
        "3383                  Edward II (2018 re-release)          FM           4800.0   \n",
        "3384                                 El Pacto        Sony           2500.0   \n",
        "3385                                 The Swan  Synergetic           2400.0   \n",
        "3386                           An Actor Prepares       Grav.           1700.0   \n",
        "\n",
        "      foreign_gross  year  \n",
        "0       652000000.0  2010  \n",
        "1       691300000.0  2010  \n",
        "2       664300000.0  2010  \n",
        "3       535700000.0  2010  \n",
        "4       513900000.0  2010  \n",
        "...             ...   ...  \n",
        "3382     19600000.0  2018  \n",
        "3383     19600000.0  2018  \n",
        "3384     19600000.0  2018  \n",
        "3385     19600000.0  2018  \n",
        "3386     19600000.0  2018  \n",
        "\n",
        "[3356 rows x 5 columns]"
       ]
      },
      "execution_count": 45,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "#use the median as the imputation technique to remove missing values\n",
     "#convert the string to numeric as it was a string \n",
     "bom_mov_clean1[\"foreign_gross\"] =
pd.to_numeric(bom_movie_df['foreign_gross'],errors=\"coerce\")\n",
     "\n",
     "#find the median \n",
     "median_foreign_gross = bom_mov_clean1['foreign_gross'].median()\n",
     "\n",
     "#impute the null values with the median\n",
     "bom_mov_clean1['foreign_gross'] =
bom_mov_clean1['foreign_gross'].fillna(median_foreign_gross)\n",
     "bom_mov_clean1\n",
     "\n"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 46,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "text/plain": [
        "title             0.0\n",
        "studio            0.0\n",
        "domestic_gross    0.0\n",
        "foreign_gross     0.0\n",
        "year              0.0\n",
        "dtype: float64"
       ]
      },
      "execution_count": 46,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
```

```
    "source": [
     "# confirm that there are no missing values\n",
     "bom_mov_clean1.isna().mean()* 100"
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "#### The dataframe is clean"
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "### Univariate Analysis "
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "1. What is the distribution of the gross revenues?\n",
     "2. what is the distribution of movies by year?\n",
     "3. What is the comparison of the gross revenues \n",
     "4. what is the gross revenue by year?\n",
     "5. Which studio generates the highest domestic and local gross? - Performance of the
studios\n",
     "\n"
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "1. Distribution of Gross Revenues\n"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 47,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "image/png":
"iVBORw0KGgoAAAANSUhEUgAAAm4AAAGDCAYAAACSmpzSAAAAOXRFWHRTb2Z0d2FyZQBNYXRwbG90bGliIHZlcnNpb24zLjMuM
SwgaHR0cHM6Ly9tYXRwbG90bGliLm9yZy/d3fzzAAAACXBIWXMAAAsTAAALEwEAmpwYAAAkSklEQVR4nO3dfbylZV3v8c/XgQQ
CBWMkmOFJGx+AhGQkTg9H1Ao0Fa3IMRN8nFIyPdkrxczMmspTaVGBYXkATQkfClSskAKz0HHsgOPwIHMYhHFQBkxBNJDhd/5Y1
+his/bsNcOsvffF/rxfr/Xa97rW/fDb63a2X67rvu47VYUkSZLmv4fMdQGSJEkaj8FNkiSpEwY3SZKkThjcjcJEmSOmFwkyRJ6oT
BTZIkqRMGN2mBS/KOJL+1k/Z1UJJvFnU3l+a5GU7Y99tfx9LcsrO2t92HPf3ktya5MuzfeyhGt6Q5K/n6viS5od4HzfpwSvJD
cB+wD3AFuAq4FzgrKq6dwbk4w1fz3xA8BBn6qnw7bUQJ8JjjdY8mOmgA9GvzjNKjYz6cy2thUBFBSDzd1mABwjjsHYuSyD/bfKzTbpd5IUQ5NBCxI4YUhmdWtPHoA1mPy
tNlgl8KOIq/Z1sSvSQM6+UDtJbq1vI2x8MT58n5RyaUfQmvB/MgX5pBNxcH5/Y43ZlzzMTRwS5yJZ1TKl5RuXnIPzw0v53TzmfJp5oumgb4Ayq1TAgX1u9t8Wm6dG8L8HC7wZ/t1sc9LVI9dS9hbWaqs+V/4FUgFsbKZuxMjG5/j1Ltay9RWMv+JHiqNXQQ/U9tqVk3bjH/j0/ngLp7kXjJ9GPoqjHdznGUWPJgwA6uc2p6OcPkKK
tryQPbxAJwOPB14BfBJ4G7gfwAvA+4X3FrQy/aGf0kPnEOl0gJRVV+vqguB5wGnJDDkCIMnZSX6vLe+b5CNJvpbkq0n+LclDkrw
bOAj4cBsK/Y0khyP9Ntw/9R+Ogkq5N8PckFSR7RjnVcko3DNSa5L/9dfsdmCNNSa5IclPJDkBeAPwvHa8K9vnl3l6bXW9MckXk9yS5
NwWThmq45QkN7Zhzt+c7rtJsJ8vC2/ea2vze2/f8EcDFwQKvj7O35zpM8vtX8tSTrkjx76LOzk5yZ5KIkdwJPSXJAkg8+dwJPSXJAkg+2OjYk+dW
h9d+c5D1D709utd6W5H5Le2fndD657ffqc72rGXT1PjY4BXAiuq6uKq+lZVbamqT1bVi4bWuzTJqiT/zqB38VFJfiTJZ9q/UySH
xla/0VJrm/H35DkBa39B5Jc1ra5Ncnfbc93Ki10Bjdpgamq1cBG4MdHfPza9tPza9tliBk0bV87TWBmTQe7dnVf3voW2eDDweOH6
aQ54MvAQ4gMGQ7elj1PiPwO8Df9eOd+SI1V7UXk8BHgXsCfzFlHV+DHgs8DTgTUkeP80h/hx4GNt+oXL4Dwk9n0KO253CQm
UmSXYEPA/8MPBJ4FfC3SR47tNovAOtCfCSxpNb8myf2+1ySHAWcALwDD2b7UvmbmlLasxn0ADnnKA1q
1XshgOHUv4A7gowzO5/cBbwM+muT7T7T7knxva396rW+rWa+E
PbNVXVnVX1rms/fXVWf9AL9XVV1fVV9AzgNWDtUQAxSpgD9gE4bVt+8/T3g0B8CpsO
v2tbXzwPHMGiTf1hVd1fVVwMAfAZ4/tN0FVfXWtv71Bv2N3Am4Cp5+mTVXRG35996jfvdkXu
M+kiyQb2+/x30kOHvro7Kpa14bEfwq4rqreXVX3X3VNX7GFwXt/XavnuBI5LsXlU3V9W61v5tBsPPB1TVnWwvRW6Zwe8R1YX3Y6YT84H
CfHVE+x8B64F/bsNcrx9x/eJK0f2S/3a7y0TeMgZfY4XIxl6Vjqrf0lbmQ0mtHJ/wOqk9L6Dxoe5eKzOEeT4P
e/wd3MwUwIggx7P4d9nqwOGt62qbwK3TVln6d+Tq1XI60/nQsKBvRT+WZd/VBGjv+g1hzQnvfIRbFSbdNhZ86Y5MyP9DHY91bHvT8uXWHmk1IzB8WVmYq0ES9dxCXbqpMuGt6Nl5IXGq3sNXhFTqZy4GUG06Hq7+0RHXTC/hzi9DNFdQf/TXwxfmMfAQQxMwCXLSmXX17LF2/sPZMFzQh4AE4kS3Ad2MaZ2Zr32yy6yVzJnaV89qYjTbpjdb1hfYT7LAfZRXvJ8CbSfwDsKe1ucyJkBnbOGsPn4wMY6vwQgXTM1PjIxbwRnNU6qTdELhp6tk0Gi5A2E9P3R+r0hDTxmf4ZjS
3uAr8yw3VS38t1eoOF9fWk79zPVJuDAJMN/Z6fud/h3vAnYMCUA7lVVzxix75sZDDMH7ODTjpBFsOVOPZW1ZbhuYDR4jJuwI2u3ICLXNQjq0w4k+NHC9XsOgnCtgAOS/dYZ2fuGsMjx5nhkCR4dx4fpnTowLYJnVozAv2sGXDoXFG2fNOlg8iLu/tMSd2ZVifyMLDCMsaINbvIotZl1wVSQSM4rrj43rJA9P5Sx/JR/dGf01pTq6OyrJUeagYzHNDvaANbnMQWgWxrkZZ12iIYY12YMpLEuKOGN1cHB4KzpYa7c1LEvgeW4Qa5QIVPuPW6/YZl5A3bPaL9Yh9I/Pcv++gh4DVHBtmv/XjvS9twxvOwHSNmFWlqoOE9GOB6AO8ivA+5Uv2p5jt+pVQndZy8VfMNZs4uGlD6QFrdwSSNVYyqtaoqtMEeHIYjtjaZMmDYnTTp9Qkmpb9GH8WI7s8BjLxdrpJmcPptg3QK7oeoYgCIxXd/hvxgAOE5kcRhwfRLl/JESfbqNa/VK3d7fDgpvEN/HlYsCqnIxcI5u9xR7URx+1CCJKkFdN0UXd4CS7I4iePhJk5MqwWHdOdT1YXWR7YtzZVtc95tqbxz7Iwj3HN3lHpQx0pY5GQFGeSjN8Stwv3NYLJs+oLGfUCT0P2BQcHNKgwJuCtpg5D6Qdv5/yI
```

9quqfquonGYTCaxj0HlJVX66ql1fVAcAvAWck+YEdrF1acAxu0gKR5GFJnsnguqf3VNXaEes8s108Hga3hNjSXjAIRI/agUP/Y
pLDkuwBvAX4QBu++wKDXqCfbteDvZFBD89WXwEOmRJ8hr0P+F9JDk2yJ9+9Jm67Zra2Ws4HViXZqw0N/hrwnm1vOaNPMwinv5F
k1wxuG/IsRszSbFYDtyd5XZLdkyxKckQL2lN9AHhWmxzwPcDvcN+esbFV1bXAXwHnJfnJrcdmcF3atlwEPCbJLyTZJcnzgMOAj
yTZL8mz27VudwHfoP3vKMlJSbaGzv9iEAbnajat1B2Dm/Tg9+EkdzDo0flNBheRT3crkGXAxxn8H+3lwBlVdWn77A+AN7ZhvF/
fjuO/GzibwdDdbsCvwmCWK4PZjH/NoJfmTgYTI7Z6f/t5W5L/HLHfd7V9fwLYAPw3gwkAO+JV7fjXM+iJfG/b/w5r1549m8Hkh
lsZTCY4uaqumWb9LQyC3VEMfp9bGXw3Dx+x7rpW83kMet/uAG5hEJJ2xKkMJhO8jcEQ+kYGkwiex2BSyqh6bwOeyWBCy20MhkC
fWVW3Mvj/ltcy6JX7KoMJH69smz4J+HSSbzCYNPHqqtqwg3VLC4434JWkzrUex68BywxB0oObPW6S1KEkz0qyRxuO/GNgLXDD3
FYladIMbpLUpxMZDEVuYjDEvWKMW7dI6pxDpZIkSZ2wx02SJKkTBjdJqRkqROjLqL9oPCvvvuW4cccshclyFJkjSjz372s7dW1eK
Z1nvQBrdDDjmENWvGeWayJEnS3Eoy9RFyIzlUKkmS1AmDmyRJUicMbpIkSZ0wuEmSJHXC4CZJktQJg5skSVInDG6SJEdmMLhJk
iR1wuAmSZLUCYObJElSJwxukiRJnTC4SZIkdcLgJkmS1Ild5rqAnu2/9CC+/KWb5roMTfTi03znUZkiTtdAa3B+DLX7q
Jg1/3kbkuQ1N88a3PnOsSJEmaCIdKJUmSOmFwkyRJ6oTBTZIkqRMGN0mSpE4Y3CRJkjphcJMkSerExIJbkt2SrE5yZZJ1SX6nt
T8iycVJrms/9xna5rQk65Ncm+T4+T4T4ofajk6xtn52eJJOqW5Ikab6aZI/bXcBTq+pI4CjghCTHAq8HLqmqA8HLqmqZcAl7T1JDgNWAIcDJwB
nJFnU9nUmsBJY1l4nTLBuSZKKeWliwa0GvtveHe7tpeBZwaGe05ZPBM6razcmrqruagOwHjgmgyMi7Aw6rq8qoq4NyhbSRJkhaMi
V7jlmRRkiuAW4CLq+rTwH5VdRNA+7tvW/1g4ItDm29sbQe35cntkiRJC8pEg1tVba6qo4ClDHrPjphm9cW/PFWJlmTZM3mzZt36u8iSZI01yYa3Kap
WH3XdWm2jfdTxzqqq5VW1fPHixwKUMrk37Shv+pP28pa22ETEhwaLOlwKbWvnREuyRJ0oIyyVmli5Ps3
ZZ3B34CuAa4EDilrXYXKcEFbvhBYKeShSQ5lMAlhdRtOvSPJsW026clD20iSJC0Yu0xw3/sD57ZZOoQ8Bzq+qjyS5HDg/yUuBG4G
TAKpqXZLzgauAe4BTq2pL29bzWkPzGNXjwhy/
ZI6YXCTJEnqhMFNkiSpEwY3SZKkTHhjcJEmSOmFwkyRJ6oTBTZIkqRMGN0mSpE4Y3CRJkjphcJMkSeqEwU2SJKkTBjdJkqROGNw
kSZI6YXCTJEnqhMFNkiSpEwY3SZKkTHhjcJEmSOmFwkyRJ6oTBTZIkqRMGN0mSpE4Y3CRJkjphcJMkSeqEwU2SJKkTBjdJkqROG
NwkSZI6YXCTJEnqhMFNkiSpEwY3SZKkTHhjcJEmSOmFwkyRJ6oTBTZIkqRMGN0mSpE4Y3CRJkjphcJMkSeqEwU2SJKkTBjdJkqR
OGNwkSZI6YXCTJEnqhMFNkiSpEwY3SZKkTkwsuCU5MMm/Jrk6ybokr27ypSRXtNczhrY5IcnOcn6JNcmOX6o/egka9tnpyfJp
OqWJEmar3aZ4L7vAV5bF+ZZC/gs0kubp+9var+eHjlJIcBK4BKK4DDgDgA+NsHaJUmSp5p2J9bhV1c1
V9Z9t+Q7gamDJNjrfquxqqxS5S3PDS0CXpzAFdrAAgVrS53vPzm9GGcrqOAAbH/sHcO1CYsH8ByQcABUuquvgM5E4Ia8oz6z0YgPnQw6QhesSD7kP2ihZvJ6fiTiKR/8YFGsTa1IMhbjeJRTbtpFEpgvZ9q/nbUWGtLJM+DiIr6NsKaD+A0JyanMRAPDF0j+GZmS0pBF6
GNrW9KWp7aPOs7KJGuSrNm8efPO/BUkSZLm3MSDW5I9gQ8Cr6mq2kxkMez4aOAq4GfiTrauO2Ly20X7/xqqzqmp5VS1fvHjxAy1
dkiRpXplocEuyK4PQ9rdV9SGAqvpKVW2pqnuBdwLTNcVAa4LfT4LR4kBaA3mkR4yOwqBB0wS5JMThPumDA
cCKJA9NciiwDFhdVTcDdyQ5tu3zZODCOatLkkRS+ugMiaxNBE2dJdY46ZpqT0ZoQeeO+AwOsjKjE2u/D46bN1Lh/n6Fo+XVR/c7q
AzgZ2ZzCb1BmlkiRpwZlYcKuqTzL6+d6ReSLL6+rSLtrHNKmDViPY1wBE7rzpJkqT++OQESZKkjVpgZtjdrNlKk9fUIzsXAAYgEN4uOKnk4crqg9ttHakFFw2GL6U80dq4sPIdlOSa7CAPkAT++ybaH7IOl1dVQSWpnggzXtuAJBicwDpVDmd59+ptsaXZhc7gKZBC
iRJkqTRxgpuVfVjwAsPAR+TZL3JvnJiVYmZSZk+xj7Grequg54I/A/kIzypOkiRJ3zXuNW
xbfntE6xPkiRJzbgPmf8L4J3ABA6rqW1bzpTkOiRJ3zHuNW4fB3Yfe2yrqN2grqTTPadh9sE2kCPD0Apw9fxngp4dp8AxH7RCPLzb5dFfjgfx
r9Ha5MkSdIsGTe47VZV39j6pL8r3pz/jbyA75zJLEWLjV4xLE5ZeAlSAY
rqs8keRzwWCDANVX17YlWJkmSpPsYt8cN4EnAIW2bH0pNFtyTvBh4NXAFsac0FGNwkSZJmybg9sbugWw6qqJ
lmMJEmSpjfurNLPA98/yUIkSZK0beP2uXkDqeqEZqEmqkSdL9Bvc3jzJIiRJkjSzcW8HlclmSg4FlVfXkJHsAiyZ
bmiRJkoaNdY1bkpcDHWD+qjUtAf5hQjVJkiRphEnJ5wK/ChwO0BVXQUbLBVXQc8clJFSZIk6f7GDW53d9V3ttG0nkySIvhQEVFWxtZkSZI0S8YNb
pcleQ0Owe5KfBN4PfHhyZUmSJGmqcYPb64HNwFrgl4CLgDdOqiRJkiRJkiTd3tizSu8F3tleKeJmgPjPqt0AyOuaauqR+30iiRJkjT
S9jyrdKvdgJOAR7kiRJkjSdsa5xq6rbhl5fqqo/Ad5aY3xq6rbhl5fqqo/BZ462dIkSZI0bNyi0icOvX0Igx74h4YiRJ09meWaVPAi5s758FfAK4RJFSZIk6f7GDW77Ak4
1cjSZKkaY07q/Qpky5EkiRJ2zbuUOMvbhKiRJ2zbuUOOmvbevzqnrbzilHkiRJ09meWaVPAi5s758FfAK4aRJFSZIk6f7GDW77Ak+sqjsAkrwZeH9
VvWxShUmSJOm+xn3k1UHA3UPv7wYO2dYGSd6V5Ykx9qe3OSLyW5or2eMfTZaUnWJ7k2yfFD7UcnWds+Oz1JxqxZkiTpQWXc4
PZuYHULXr8NfBo4ZGNGH+9qo6qr0uAkhyGLACOLxtc0aSRW39M4GVwLL2GrVPSZKkB71xb7Cngx8F8B8c7Cngx8F/A14AXV9Xvz7D
NJ4CvjlnHicB5VXVXVVXVVVV0A1gPHJNkfeFhVX5VxSAsPmfMfUqSUmqSJD2ojNvjBrAHnNnvYZVmTfMfM5ok4rW8rW8J9Jzpsb
G1L2vLU9pGSrEyyyJsmazZs372B5kiRJ89NYa0Nj74OOK017Qq8ZweOdybwaODR6qqs6pqeVUtX7x48QZ4mEUb6x48Q6
UJ0mSNH+N2+P2XODZwJ0AVbWJHXJHXjkVVV9paq2VNW9wDuBY9pHG4EDh1ZdCmxs8pHG4EDh1ZdCmxq7UtHtEuSJC044wa3u9s1ZgWQ5Ht35GDtmrWtn
gtsnXF6IbAiyUPbEOwyYHVV3QzckeYTNpv0ZOCCCHTm2JElS78a9j9v5Sf4K2DvjxK2DvJy4GXMOgxm1aS9wHHAfsm2Qj8NnBckqMYBMA
bgF8CqKp1Sc4HrmLwLNRTq2pL29UrGMxQ3R34WHtJkjQtODMGt9bT9XfA4HTtJkiQtODMGt9bT9XfA44DbgccCb6qqi7e1XVU9f0Tz32xj/VXAqhHta4AjZ
qpTkiTpwW7G4FZVleQfquEVfqupoYJthTZIkSZMz7jVun0vn0rypIlWJkmSpG0a9xq3pwOvSJLUSJEn3tc3gluSgro
RePos1SNJkqRpzNTj9g/AE6vqi0k+WFU/Ows1SZIkaYSZrnEbFoiRJkrZtpuBW0yxLkiRpls00VHpkktm8VHpkktsZ9Lzt3pbhu
5MTHjbR6iRJkvQd2wxuVbVotgqRJEnSto17JzJHJkiTNMYObJElSJwxukiRJnTC4SZIkdcLgJkmS1AmDmyRJUicMbpIkSZ0wuEm
SJHXC4CZJktQJg5skSVInDG6SJEdmMLhJkiR1wuAmSZLUCYObJElSJwxukiRJnTC4SZIkdcLgJkmS1AmDmyRJUicMbpIkSZ0wu
EmSJHXC4CZJktQJg5skSVInDG6SJEdmMLhJkiR1wuAmSZLUCYObJElSJwxukiRJnTC4SZIkdcLgJkmS1AmDmyRJUicMbpIkSZ0
wuEmSJHViYsEtybuS3JLk80Ntj0hycLr2s99hj47Lcn6JNcmOX6o/egka9tnpyfJpGqWJEmazybZ43Y2cMKUKUttcDl1TVS9
p4khwErgMPbNckWdS2ORNYCSxpAZ4z1H5eVd1VVRuA9cAxY8fVd1VVRuA9cAxSfYHHlZVl1dVAecAPzbKnkfrSmUYA
JkrSgzPY1bvtV1c0A7ecjW/sS4Kah9Ta2tiVteWr7SElWJlmTZM3mzZt3auGSJElzbb5MTOYQ
OIkSZLmg9kObl9pw5+0n1tf+0bgwKH1lgKbWvvSEe0ZU+k/vTZr7BTAD2Z+l9pc+9mHqmYEl+iLS9SwjNkY+Oxd
kSQvKLpPacZL3AccB+7hbOWf3+87OC4rjcRdNSLUW4P7wuB4fXL0U4rPA3AMoQQs3Bp3kkFHh+I
bBqRPsa4IdWJokSVKX5svkBEmSJM3A4CZJktQJg5skSVInDG6SJEdmMLhJkiR1wuAmSZLUCYObJElSJwxukiRJnTC4SZIkdcLgJkmS1AmDmyRJUicMbpIkSZ0wuEmSJHXC4CZJktQJg5skSVInDG6SJEdmMLhJkiR1wuAmSZLUCYObJElSJwxukiRJnTC4SZIkdcLgJkmS1AmDmyRJUicMbpIkSZ0wuEmSJHXC4CZJktQJg5skSVInDG6SJEdmJPgluSGJGuTXJFkTWk7qtW3A+gVgq2vfW1Ck0rMmRJ+j3xTq1V2Q9.
dYnuTbJ8XNRsyRJ0lybyx63p1TVUVW1vL1/PXBJVS0DLmnvSXIYsAI4HDgBOCPJorkoWJIkaS7Np6HSE4Fz2vI5wHOG2s+rqru
qagOwHjhm9suTJEmaW3MV3Ar45ySfTbKyte1XVTcDtJ+PbO1LgJuGtt3Y2iRJkhaUXebouD9aVD5ZuSPBK4OMk121g3I9pq5IqDE

LgS4KCDDnrgVUqSJM0jc9LjVlWb2s9bgL9nMPT5lST7A7Sft7TVNwIHDm2+FNg0zX7PqqrlVbV88eLFkypfkiRpTsx6cEvyvUn
22roM/BTweeBC4JS22inABW35QmBFkocmORRYBqye3aolSZLm3lwMle4H/H2Srcd/b1X9Y5LPAOcneSlwI3ASQFWtS3I+cBVwD
3BqVW2Zg7olSZLm1KwHt6q6HjhyRPttwNOm2WYVsGrCpUmSJM1r8+l2IJIkSdoGg5skSVInDG6SJEdmLhJkiR1wuAmSZLUCYO
bJElSJwxukiRJnTC4SZIkdcLgJkmS1AmDmyRJUicMbpIkSZ0wuEmSJHXC4CZJktQJg5skSVInDG6SJEdmLhJkiR1wuAmSZLUC
YObJElSJwxukiRJnTC4SZIkdcLgJkmS1AmDmyRJUicMbpIkSZ0wuEmSJHXC4CZJktQJg5skSVInDG6SJEdmLhJkiR1wuAmSZL
UCYObJElSJwxukiRJndhlrguQdrpFu5JkrqvQkO9fciA3b7xxrsuQpO4Z3PTgs+XbHPy6j8+c65LkKQHBYdKJUmSO
mFwkyRJ6oTBTZIkqRMGN0mSpE4Y3CRJkjrhrFJJk+ctWuydb9Ei9OVqEXXLvOMtWqQpOVQqSZLUiW6CW5Zq29Rs2tag4A9rUd9qX
1PZIkSbOti+CWZBHwl8DTgcOA5yc5bG6rkiRJ6ks3wQ04Gri+qq6vqruB84AT5rgmSZKkbvQU3PYFbhx4fFNbJ0mSpDH0NDk1I9bV/RokK4AV7eGmJD8co/97A7dO9hy7aH4fuWBkJTIiu5+8tMbkq+lhxOf+a3tB/fH6YvjQ73fckG9Q6IdD/nvvpdbLJQ6f9R8a6wwWyDIsxxzr+0x+mp3l1n9L8c2Rq6IXsBXt0Mc/tvPf1sv1oHvlWdBz7nM6EMaf95PMoGbTm2q82c7/P7yhgu+Tvwc+3Ed2OZ1o/xJhNdH9kW47/7vR+YX4feNOk1Ffj3M7cf5zTm0m2ypi9N7/nn47zHxRgx4VNIcFsltVtzaggGqt46qa4PsT5vpMPoznyXIsyaN9b7

ZjfO4rQuBk9sMkWOBr1fVzbNd6AI24zlKchDwIeCF9grMmRnPU1UdWlWHVNUhwAeAVxraZt04f/MuAH48yS5J9J9gB+GLh6lutcy
MY5Rzcy6BElyX7AY4HrZ7VKzWSHsoM9bjOY7nFbSX65ff4OBk90eAawHvgmg//S0Sw5ZV2UWaybZ5GHB9OQzRtbP2GeXWOeJ82xcc5
TVV2d5B+BzwH3An9RVUPqmvr79vwwwwLKDT06QJEnqhEOlkiRJnTC4S
ZIkdcLgJkmS1AmDmyRJUicMbpIkSTtopofJT1n34CSXtIfKX5pkux+/aHCHT1I0kW5JcMfQ6ZCfs8y1JfmInlEeSPZOcmeT/Jfm
/7XFQL98Z+5Y0b53Nth8mP+yPGTyf9AnAW4A/2N6DeTsQSd1I8o2qib+gO0k4yeyebkq+reJIuBl1TVW6est6iqt
ky6Hkmzo/1H5Eeq6oj2/tHAXwKLGdyj7eVVdU2SCVYfvS+/P+zSuJGTA6Zzj9dSAWqDtaX8XryyQjaeRnebVTlPNs6JeV0iVgo5z6tiBetrYpn4gJRzH7NotiZ1pa1+OJ++BI/
oJJe1XrB/SrJ/W+/sJD/Xlp+R5Jokn0xYepKPtPY3t+GQS5Ncn+Q1h7/Bx3zv+GS5Ncn+RXR9TxaOAYWmgDqKrNW0NbkuOS/GuS9wJrk+yW5b5P8/kWdt65
57S1js8yerWo/i5JMuSfG+Sjya5Msnsnnkzxv8t+spAfgLOBVVVXU08OvAGa39Sn2n/Jzgb2SfvvgBw7NqEnbeg8nvd1VFB3VhmvNA4dfDsG92fPrrQdhZR
5DP5AXpbkLQzuTv6ats7eVfXkJLsClwEnVtXmFnwWAS/ZuuMkwF/BfzPqtrQ7no+5/HDgygQbrHnFl3x76/HDgyq2hbRrHA
Ee0/b8WoKp+MMnjgH9O8hjl4E/q6q/bY8zWg/Y8zWsTg7uqbuquqnW60PH/cLkzS7kuwJ/Ajw/vbfDxhT9HjHoCHtp+/DvxFkhcBhcGzbPgC+BGzXaID
BTVJPvlVVR210G5190wLM1Wq/fA/4coZ+zb3v/PmDl0Ocfraq7gLuS3S3ALsx+Ah0SMl+U3gJ
OCRVXVAa149tP8fA/4coA2hfBF4DHA58JvtouUPVdV17bFFf5zkrQygY/5tuuNKmnMPAb42/aqTyGY/5tuuNKmnMPAb42/Ldqq6raBPwMfCfg/WxVfX17dy5
JD1Z3tp8B1lXVUe31g1X1U1rPWDdt219yFu7/H75XAUcmeQh4rHr6+5c2h55PGq6r3As4FvAf+U5KlV9VVa1qf7iHr1+5c2h55PGq6r3As4FvAf+U5KlV9VVa1qf7iHr1+5c2h55PGq6r3As4FvAf+U5KlV9VVa1qf7iHr1+5c2h55PGq6r3As4FvAf

lX1jTZN/y+B66rq7XNdlyRt5VCpJH3Xy9us1XXAwxnMMpWkecMeN0mSpE7Y4yZJktQJg5skSVInDG6SJEmdMLhJkiR1wuAmSZLUCYO
UCYObJElSJ/4/AaaPKjAcDtkAAAAASUVORK5CYII=",
      "text/plain": [
       "<Figure size 720x432 with 1 Axes>"
      ]
     },
     "metadata": {
      "needs_background": "light"
     },
     "output_type": "display_data"
    }
   ],
   "source": [
    "\n",
    "plt.figure(figsize=(10, 6))\n",
    "plt.hist(bom_mov_clean1['foreign_gross'], bins=5, edgecolor='k')\n",
    "plt.title('Distribution of Foreign Gross')\n",
    "plt.xlabel('Foreign Gross')\n",
    "plt.ylabel('Frequency')\n",
    "plt.show()\n",
    "\n",
    "#1e9 represents 1,000,000,000\n",
    "\n"
   ]
  },
  {
   "cell_type": "markdown",
   "metadata": {},
   "source": [
    "2. Distribution of Movies per Year"
   ]
  },
  {

```
   "cell_type": "code",
   "execution_count": 48,
   "metadata": {},
   "outputs": [
    {
     "data": {
      "image/png":
```

"iVBORw0KGgoAAAANSUhEUgAAAYUAAAEmCAYAAACNq4wIAAAAOXRFWHRTb2Z0d2FyZQBNYXRwbG90bGliIHZlcnNpb24zLjMuM
SwgaHR0cHM6Ly9tYXRwbG90bGliLm9yZy/d3fzzAAAACXBIWXMAAAsTAAALEwEAmpwYAAAeP0lEQVR4nO3de7hVdb3v8fdHICQ
uKrJkcxPK0B1qXiKtbSqpbTHzkm2NTpoVZs8+VlbWFssjmbK108nMU1aeLmrlhayU1NLSSLRM8ZKGSpKgIAiIGkKKAd/zx/itw
WA511oDWHOOudb6vJ5nPmvM37h95mWN7xx3RQRmZmYA21QdwMzMmoeLgpmZ5VwUzMws56JgZzWMs56JgZmY5FwUzM8u5KJiZWc5FwZB0uaT
zK5q3JP1A0vOS7Qq8poKR5Vc0/ZRgnKST1rTJHkaSFkg5r4PwwLPwNKH0j7hM0sBC2ymSZlcYq17eDrwTGB0R+
1UVIiJ+HxG7VTV/s2bhotC8i4ic0nqs5mjjjAUWRsSaeu/JkevM7iYanHN/ZrFkrQ7DBWr7AqEndQldn4IMTvq4ftT+1Tgu
fknSXpK9JekHSE5L+LbUvkrRc0jtVjVlZJJJjtM0q8lvSjpDkljC9P+19TvOUnzJJ1Q6He5pG9JulnSGuAdNfKOlDRL0nOS5ks6
8DbJK2WdG6NcTfrtUjaTtKVklZIelLS2ZK2kdQ/jb9HYgWSS9J2qntZouUadNfKOlDQrjT9f0kdT+1Tgu
AP0hZpkn6m6SVkmZKGtrO+NtJ+p6kpZkelnR+a9GVtIuk29M0npXgSTkrv20pJX6iVqzBsf0n/R
9JT6X34tqQBqd8Okm9M79/zaGrvcP6STkrv20pJX6iVqzBsf0n/R
sBA4Dfgacn9pOAWan7nFAAH0L48wGTkndHwLWAR8G+gDnA08B3wT6A/8OvAgMSSsNfnp4flPp/Hbgz9RsILErT6gvsCzwL7F4Y9
+/AAWQ/Mrat8XruAC4FtgX2BlYAhxay3tnBe7G5r+VK4AZgUPAH0L48wGTkndHwLWAR8G+gDnA08B3wT6A/8OvAgMSSsNfnp4flPp/Hbgz9RsILErT6gvsCzwL7F4Y9
/R+Ck1D0IeGs72Sel7F9OWQcAnwLuBkantu8AV9f6XIHrU/+BwE7APcDHUr83kG126w+0AL8DLk79dkuf2dkuf2cjCdHdJ3R3NfwKwm
o3fg4tS/sPaeX0XA7OAoen9/gVwQeq3I/Be4OAvQevj3gRcC+wA9ObovefSm1v4tsobxDjfn3B54D3lhoewB4bxfkm03
2Pdud7Hvfr+rlQsOWP1UH8KPGh7KxKOxBtsBtYfOLwuuOFfnum4YcX2lYCe6fuy4FrCv0GAeuBMcD7gN3+3yfcdYHph3Cs7eC1j0
rQGF9ouAC4vZO2sKJR6LWRFYy0wodDvDY4X37TDgiUK/u4APpu5JbCwK+wNPtclxFvCD1P074FxgEDT8xH
AP9OCJ/9cgeHptQwoDPt+4LftzOtY4IHU/QZgeXq9/doM19/doM19H8z2nzPRiY8r+qKAAC1pCKTWp7G7CgnXx7A88X5rmB2gv6ScBLb
PrdXk77hfdbpEJPtgB/nqxYbHG+wv/Tl7b2f7k7k7PryNs4lFxF8k3QhI/tn3hzLCt0vpem1bRtUeL6oMN/Vkp4DRpJt0gu
FYfsCP6w1bg0jeci4sVC2JZqVVC25PAxBKvoVXZ1zKM7Jf9k23mNSp13mWsDlOuQZgLAKlqE26t0nTzgPkxKEViUNDDGbZGxYcPnhxYzQ1PgqKh==
...

gTFG4Q9LngQGS3gn8BPjF5sxE0jhgH+BPwPB02YzWy2e0rnWMAhYVRluc2szMrEHKFIVpwArgYeBjwM3A2WVnIGkQ8FPgUxGxq
qNBa7S9ao1E0qmS5kias2LFirIxzMyshDJHH21IN9b5E9lCel5EdLr5CEBSP7KC8OOI+FlqXiZpREQslTQCWJ7aFwNjCqOPBpb
UyHMZcBnAxIkTS+UwM7Nyyhx9dCTwN+AS4BvAfElHlBhPwPeARyPiokKvWcDJqftk4IZC+xRJ/SW9DhgP3FP2hZiZ2dYrc/LaV
4F3RMR8AEm7ADcBv+xkvAOAk4CHJT2Y2j4PXAjMlDQVeAo4HiAi5kqaSXYf6HXAaRGxfvNejpmZbY0yRWF5a0FInmDjJp92RcS
d1N5PAHBoO+PMAGaUyGRmZnXQblGQdFzqnCvpZmAm2T6F44F7G5DNzMwarKM1haMK3cuAg1P3CmCHVw9uZmbdXbtFISI+3MggZ
mZWvU73KaQjgT4BjCsO70tnm5n1PGV2NF9PdmjpL4ANdU1jZmaVKlMUXo6IS+qexMzMKlemKHxd0nTgVmBta2Prxe7MzKznKFM
U9iQ7Ce0QNm4+ivTczMx6kDJF4T3A64uXzzYzs56pzFVS/wxsX+ccZmbWBMqsKQwHHpN0L5vuU/AhqWZmPUyZojC97inMzKwpl
Lmfwh2NCGJmZtUrc0bzi2y8A9prgH7AmogYUs9gZmbWeGXWFAYXn0s6FtivXoHMzKw6ZY4+2kREXI/PUTAz65HKbD46rvB0G2A
iGzcnmZlZD1Lm6KPifRXWAQuBY+qSxszMKlVmn4Lvq2Bm1kt0dDvOczoYLyLivDrkMTOzCnW0prCmRttAYCqwI+CiYGbWw3R0O
86vtnZLGgycDnwYuAb4anvjmZlZ99XhPgVJQ4HPAB8ArgD2jYjnGxHMzMwar6N9Cl8BjgMuA/aMiNUNS2VmZpXo6OS1M4CRwNn
AEkmr0uNFSasaE8/MzBqpo30Km322s5mZdW9e8JuZWc5FwczMci4KZmaWc1EwM7Oci4KZmeVcFMzMLOeiYGZmORcFMzPLuSiYm
VnORcHMzHIuCmZmlnNRMDOzXN2KgqTvS1ou6S+FtqGSfi3p8fR3h0K/syTNlzRP0uH1ymVmZu2r55rC5cDkNm3TgNsiYjxwW3q
OpAnAFGD3NM6lkvrUMZuZmdVQt6IQEb8DnmvTfAzZHdxIf48ttF8TEWsjYgEwH9ivXtnMzKy2Ru9TGB4RSwHS351S+yhgUWG4x
antVSSdKmmOpDkrVqyoa1gzs96mWXY0q0Zb1BowIi6LiIkRMbGlpaXOsczMepdGF4VlkkYApL/LU/tiYExhuNHAkgZnMzPr9Rp
dFGYBJ6fuk4EbCu1TJPWX9DpgPHBPg7OZmfV67d6jeWtJuhqYBAyTtBiYDlwIzJQ0FXgKOB4gIuZKmgk8AqwDTouI9fXKZmZmt
dWtKETE+9vpdWg7w88AZtQrj5mZda5ZdjSbmVkTcFEwM7Oci4KZmeVcFMzMLOeiYGZmORcFMzPLuSiYmVnORcHMzHIuCmZmlnN
RMDOznIuCmZnlXBTMzCznomBmZjkXBTMzy7komJlZzkXBzMxyLgpmZpZzUTAzs5yLgpmZ5VwUzMws56JgZmY5FwUzM8u5KJiZW
c5FwczMci4KZmaWc1EwM7Oci4KZmeVcFMzMLOeiYGZmORcFMzPLuSiYmVnORcHMzHIuCmZmlnNRMDOznIuCmZnlXBTMzCznomB
mZrmmKwqSJkuaJ2m+pGlV5zEz602aqihI6gN8EzgCmAC8X9KEalOZmfUeTVUUgP2A+RHxRES8AlwDHFNxJjOzXkMRUXWGnKT/A
CZHxCnp+UnA/hHx8cIwpwKnpqe7AfO6aPbDgGe7aFpdxZnKa8ZczlSOM5XXVbnGRkRLrR59u2DiXUk12japWhFxGXBZl89YmhM
RE7t6ulvDmcprxlzOVI4zldeIXM22+WgxMKbwfDSwpKIsZma9TrMVhXuB8ZJeJ+k1wBRgVsWZzMx6jabafBQR6yR9HLgF6AN8P
yLmNmj2Xb5Jqgs4U3nNmMuZynGm8uqeq6l2NJuZWbWabfORmZlVyEXBzMxyLgpmZpZzUTAzs1yvLQqSDpf0LUmzJN2QuidXnas
WSedUOO/DJU2VNK5N+0cqyiNJJ0g6PnUfKukSSf9TUtN8nyXd3gQZhrV5fmJ6r06VVOtE0UZkeo+koam7RdKVkh6WdK2k0RVlu
kjSAVXMuz2Shko6R9Ip6Xv+BUk3SvqKpB3qOu/eePSRpIuBXYEryU6Yg+xEuQ8Cj0fE6RVFq0nSUxGxcwXz/W/g7cD9wFHAxRH
xf1O/+yNi3woyXQrsBLwGWAX0B34BvAtYVsVnJ+mhtk1k3695ABHxpkZngk0/I0lnAwcCVwHvBhZHxKcryPRIRExI3dcCdwM/A
Q4DPhAR76wg0wrgSaAFuBa4OiIeaHSONpluBh4GhgBvTN0zgXcCe0VE3a4J11uLwl8jYtca7QL+GhHjK8i0qr1ewICIaPg5JZI
eBvZJ549sT7ZAmRcRn5b0QETsU0WmiNhTUj/gGWBERLwiqS/wQETsWUGmWWQF6nzgJbLP7PdkBZWIeLLRmVKu/DOSdD9wYESsS
e/d/RW9V/MiYrfUfV9EvLnQ78GI2LuCTA9ExD6SxpOdMDuF7Dypq8kKxF8ryPRgROydlkmLI2JU2371mnfTrG432MuS9qvR/hb
g5UaHSV4AxkfEkDaPwcDSijL1jYh1ABHxAtnawhBJPyH7pV6F1jz/BO5NV9Ml5VxfRaCIOBr4KdmJRXtFxELgnxHxZFUFIRkga
R9Jbwb6RMQayN+7St4rYLakL0kakLqPBZD0DuDvFWUKgIh4PCLOi4jdgROAbYGbK8q0TdpMNAYY1Lr5VtKO1Pl/r6nOaG6gDwH
fkjSYjZuPxpD92vtQRZmuBMYCy2r0u6rBWVr9TdLBEXEHQESsB6ZKOh94b0WZnpE0KCJWR0S+D0jSvwCvVJSJiPi5pFuFwnRN
nVFs2gpcFHqfk7SiIhYmhYs6yrK9HHgC2y8uvGnJa0h2wR4UkWZXrV/JSIeAh4Czmp8HAAuAB5L3R8BvispyO4zc249Z9wrNx+
1SguSUWRfisUR8UzFkZpK+jVHRLxUo9+oiHi68alqkzQQGBgRy5sgy17A2yLi21VnqUXZzaz6R8Q/Ks6xHdna6MqKcwyKiNVVZ
qglfU5Km2/7AnsDT0dEXbcc9OqiUIukf42IxzofsnGcqRxnKq8ZczlTOfXO5KLQRlVH+nTEmcpxpvKaMZczlVPvTL1yn4KkS9r
rBWzfwCgbZ+xMpThTec2Yy5nKqTJTr1xTkPQicAawtkbvr0bEsBrtdeVM5ThTec2Yy5nKqTRTRPS6B3A78G/t9FvgTM7U3TM1a
y5nav5MvXVNYSjwclR89EWRM5XjTOU1Yy5nKqfKTL2yKJiZWW298oxmSdtJulDSY5JWpejqW17Z3Km7p6pWXM5U/Nn6pVFgez
CUs8DkyJix4jYEXhHavuJMzlTD8jUrLmcqckz9crNRypclGtz+jmTM3WXTJ3N2++VM7Wnt64pPCnpvyQNb22QNFzSmcAiZ3KmH
pCpWXM5U5Nn6q1F4X3AjsAdkp6X9BwwGxhKdnVEZ3Km7p6pWXM5U5Nn6pWbjyC7fgjZjXXujsLFsCRNjohfOZMzdfdMzZrLmZo
8UxUnZlT9AD5Jdune64GFwDGFfvc7kzN190zNmsuZmj9Tw19sMzzIbm03KHWPA+YAp6fnDziTM3X3TM2ay5maP1OvvCAe2V2oV
gNExEJJk4DrJI2lxg03nMmZumGmZs3lTE2eqbfuaH5G0t6tT9Kb/25gGNDw+9Y6kzPVSTPmcqYmz9QrdzRLGg2sixp3WpN0QET
c5UzO1J0zpXk3XS5nav5MvbIomJlZbb1185GZmdXgomBmZjkXBbPNoMydko4otJ0gqbIT1My6kvcpmG0mSXuQXalyH6AP8CAwO
SL+tgXT6hMR67s2odmWc1Ew2wKS/jewBhiY/o4lO1SwL/DFiLhB0jjgh2kYgI9HxB/SMefTgaXA3hExobxDrnomC2BSQNBO4
HXgFuBOZGxI+U3QDlHrK1iAA2RMTLksYDV0fExFQUbgL2iIgFVeQ3a09vPaPZbKtExBpJ1wKrya5aeZSkz6be2wI7A0uAb6STk
NYDuxYmcY8LgjUjFwWzLbchPQS8NyLmFXtK+iKwDNiL7KCOlwu91zQoo9lm8dFHZlvvFuATkgQgaZ/Uvh2wNCI2ACeR2aO2o
uCmZb7zygH/CQpL+k5wCXAidLupt5HXDqzpeUezmZnlvKZgZmY5FwUzM8u5KJiZWc5FwczMci4KZmeVcFMzMLPf/AZ1weejpLyHfAAAAElFTkSuQmCC",
      "text/plain": [
       "<Figure size 432x288 with 1 Axes>"
      ]
     },
     "metadata": {
      "needs_background": "light"
     },
     "output_type": "display_data"
    }
   ],
   "source": [
    "bom_mov_clean1['year'].value_counts().sort_index().plot(kind='bar')\n",
    "plt.title('Number of movies released each year')\n",
    "plt.xlabel('Year')\n",
    "plt.ylabel('Number of movies')\n",
    "plt.show()\n"
   ]
  },
  {
   "cell_type": "markdown",
   "metadata": {},
   "source": [
    "## Bivariate Analysis"

```
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "3. comparison of gross revenues"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 49,
    "metadata": {},
    "outputs": [
     {
      "data": {
       "image/png":
```

"iVBORw0KGgoAAAANSUhEUgAAAYIAAAEWCAYAAABrDZDcAAAAOXRFWHRTb2Z0d2FyZQBNYXRwbG90bGliIHZlcnNpb24zLjMuM
SwgaHR0cHM6Ly9tYXRwbG90bGliLm9yZy/d3fzzAAAACXBIWXMAAAsTAAALEwEAmpwYAAA3SUlEQVR4nO2dfZwcZZXvv7+ZdGR
CIBMksmQgEBATiZBEoqBxVaISkAWyIiKiXl2QxVvOl6QS3eiCexVZVJb1jReBzQ2GNdxrUBTlJTEJECRuNoEkE9QgD
G8ZzGRy7h9VPdT0VHVX9/R7ne/nM5/prqquPlXdfc7znHOec2RmOI7jONml1o9ECOI7jOI3FDYHjOE7GcUPgOI6TcdwQOI7jZBw
3BI7jOBnHDYHjOE7GcUPgNBRJUyS9IKmz0bJkJrqr0XI4jccNQZsg6XFXJ/ZKel9Qn6ReSLLpTUVJ9xxKOc788/NbKuZjTezw
QrOdbCkb0jaERqTzZJukDS9uLDnHS7LwmvJ/66v9Pmb2PTM7qdrnzSPp/ZLul/SipN+Hj/9Kkmr1nk5l/NJWScEbNaWa2H3A
YsAS4BPhWY0WqDZeCfwCGAf8KbAf8HrAg4zpm4CVofu0EiOn4ON7Z5b64kdcr6WLgK8BS4E+Ag4ALgbzpzpzZiZiZ/
7XBH/A48M6CbW8E9gKvC59PAL4ASeAC4DOsJ9HwHuHuBa4C+oDNwJvD3duaP/I3wmP/Fnf3TRwwVBHRwCvwRLbrCfQcCPwaMJ
Bx3dCefqBF4DPAocDBowJX3sA8G/ADuAZYFnC9X4X4+RWJ+XP+GY+Ebwnt9YfHw8/ejwnh8fsA3wX+EMr+IHBQ5P5sBp4Ht
gDnxrzf5PDaDohsmw08BeSAVxMYqmfDbDeTXkHtMwnssD+/rJuBjkX2LgVvVDa3gOOD/8zL3sA3wX+EMr+IHBQ5P5sBp4Ht
gDnxrzf5PDaDohsmw08BeSAVxMYqmfDbTeXkHtMwnssD+/rJuBjkX2LgVvDa3gOOD/8zL8FPAn0hvetM3JNP4+8/iRgYyjfNaG
s50ePDT/zZ8J7cEqC/BOAF4EzS3xnbwC+DtwZHv9O4LXAT8L4PXL8u4FHW8+gF+W8J5RsfvB8b1CX8BhDEG7fC
nw8fPxt4P8QjJ4PB34DnBfu+wiwB/go8BkqjK3A1wiU/knhD3DBoD5BgwMjP0ljW8UUN9+bvwkFAsjp1DL3/9v0G7FVHxF1hNeWY/NW
t2xKu9z5gcYl7kj/3t4F9gS7gLwgU6BHAeOB24Dvh8X8X8ZXse48B4cB+wfvvvvY5YFp43MHAjIT3TXMVw5bwwUuDZ8fCPwOQJjtA/wl
hJyxxmCnxIo6X2AWQRG/R3hvsXAALAgfI8uYBnwr+E1vAp4LyGf+/+8DxgeE1vgcYA3wyPFfUEAwAHwvvvzccJjLViZDyZ4Ls
0Qv6C424gMDpzQ3n3Cz+bvyOYNcwj+M7l7/uTwJ+GjycCJo0JDRcTzCaeyTFsYcBPwYeIhhpHNJo+Wt0Tx4n3
hDcFyqfTuCPwNGRfX8J/CR8/BHgvyL7jgmV0UGRbX8NVBRvZX8Ij/m3gulLFwYjcfZG/vwUOBQaB/SLHXgncE
D5eDNwT2XdQ+Jl3Rbad9wd+czzhuDDwC8jx+VljxqCTZH940IZ/yRG/g8Cvy3Y9/ovvw0vovj9+MG4NuRY/4U+C2R0TyB8VwcPt5
K8J3dv+Dcid83/0v316oxghsIRh1p+BLBl+Ygi/MlbUSqknpIZguH0gwynoisu+JcH+e30Ue9wOYWeG28cAkAkWwE/C
rdDMAreBNwVBnAXpZT1UOBpM3smxbF/IDAchIHFvizyzeMh7JpMZ4LhUMHWAAncFAag/0lSzsxeBKmKlFkYD
0rcCbJE0G3kqgLH8W7vsBYvssgYJ9QNIGSX9R4vI5gPDEPpbJ0YgpEmNnvzBfDxh6M+c6G2D8UFKuBtQ5F/TPm+aHg/Xp/ImsoiH2mYHr
Ex5/oDcGA0RmFmbw4/nz8wPDZZ+N1Ps9+PotR5GMEJ+MvI5/SvBzKCQpydXWqBhtxcc89vI/
l3hw/Ex5/oDcGA0RmFmbw4/nz8wPDZZ+NlsM7O9Cdd3JoF76AlJP5X0pnB7pd83J6QlDYGZ3UOg3IaQdKdKI+lnkR/q0QS
jQIC7gTPqKGpDkfQGh/Rzwl80gMEyiHPFAJfa7k8RWAUZkQU1QZGw9gZs+b2cZwGvl3SXs4sus3tO2ABJ3Slk+DGwI
GVWVPQ9dzDyHuwBfmdmA2ZZ2h2hZkdTRAf+IF1IAAf+TOCkTJmMtLM3kJhPRPXJ1us3kO2tS3w0SzWxERA6llBzUlOqPySX8vI
lP0DSfgXyRz/D6LVuI5gRRA3K/mY2I+bcTwKH5J+LY45VMwbJYXRpH9fxyFtN2NWlmLxYwAHJTHJZaS+bBsSvs2JGNxHyEdTmhEt83Jj
QgSuA74hJkdRzCNvibcp5Li/BtweWlF0Yw8dswTBxDPNhIOYKh7V8tiStn8ZM3cnvF5mz7xwhMzu9ba3pa0MsgqvQuXaXOp/4hiXF3k
/maRXh8rkOQ3J774k/cIFPBAe0bL1lYiK9u/7XFGPHOwx7Uta4ryYYgDftKX8DTtr/mmn08vpgq4KgxQqPsF/HDJOEGzp0tEz0kRLh8HFmhmeFW9XJd0AHs3KU2O7E
4zgHTeAgkuHd/gtKU2o4KaxpCLnHiw3cAE2uICkNpuLrcN+lbbv3E08NlRWQXLdQpPmd4D8bk6BNzbMt9bsfvW0HL3c0CoXsNXpa/qKyUUiu8usq+JPF8oYwG0tTS9gQbB3E94
3vX5CKXf9tMHAV2kCdHGnbrddxrNaNz0ZkFOK5+E2xcVhE0HdNqA5tjbgxE21jgagHDQIk6JcvvPuJA3cRjHkYBaPnNG9LbdPnZoi7lAUx4nexCEHG0Ps9CVpGV3+ee
sNlW1KkL0ML8P/+7Wg+yP1jPq8exbJ5mQaRE1BZn+mODRLy0OdNSFiotB0U9tR74ptSZL3Rhr4whBLZHoKUTUeLsCrQr7Qe9b43ZX3bdhqhtSDHkKN9XTG3+nx0h
lVhcQnD4jdYOMqLSxkM1t9z3bDJ1wLQqdkN9ErLDLVGS7Wj5jPQ3tnxIBjcwe1ohRmyjn5IK8ZDZXhKnVaL4ck0nSQwO7ZxlKnWQXPbrI3Mw6ef5hPqOe3D0bKnpQW0Th1R6K2OpkM
Ed9XGxh2/Zq+wbBS05qVxxwkSNSx+AzoxhTDLgwxT9pkUvsk7qG0H7vkq0BEhbvu5PiPRMg6djXWHZqhN0AgkUYmiaTrPe2M/ZEw72jZ99SPo+dsqjtVkCnsNhpdNOlKW1kfZ
ZwyqHZ5ibTnS3L/9FTJLdROZTMcpxrU0hD0ANsiz7eH26J8FXgtsAN4GPikme0tPJGkCySStlrR6586dtZLaXDaxfrSnq/WtaG
8CKHjDKeWhkAx2wpdv/OBdcBkYVBwVUn7j3iR8pGXV1Fshpz1frYvDeRFCxxlOLbOGtgtOHRp4fQjDyj/JRY
ImZGbBJ0hZGoVBADeVyUlLt8hLlnK+Wq5m9bIbjDEeBDq7BiaUxwG+AdwC9wIPAB8xsQ+SYa4F/AxfsDMWA2Cfg

cW716dU1kdsqjESmYnvbpOJUhaY2ZzYnbV7MZgZntkXQRsBLoBK43sw2SLgz3Xwv8L+AGSQ8TuJIuKWYEnOahESUgvOyE49SGm
s0IaoXPCJqDuUtWxa7+7enu4t5F89rmPR2nXWjIjMBpbxqRgtkuaZ/u3nKaDa815FREI1Iw2yHt01c1O82IGwKnIhqRgtkOaZ+
+qtlpRtw15FREI1Iwq/mejXLPtIt7y2kv3BA4FdOIzmXVeM9GZh9N7u6KDXi3knvLaT/cNeRkjka6Z9rBveW0Hz4jcDJHI90zv
qrZaUbcEDiZo9HumUa41BynGO4acurKsrW9zF2yiqmLVjB3yaqGpE26e8ZxhuMzghalFRclNUuJCHfPxNOK3ymnOniJiRakUKF
CMKKtZqnmWuAlIpqXVv1OOekpVmLCXUMtSKsuSvIc+ualVb9TTnVw11AL0kiFumxtL1fcsYFndg0A0N2VY/HpM1KNGhsdpHWSc
SOdbXxG0II0qubOsrW9LLx1/ZARAOjrH2DhD9anCvp6kLZ5aYc6Tk7luCFoQaqpUMvJ4lm6ciMDgyNjSgN7LZULoZwWlM2QXZQ
l3EhnGw8WtyjVyPAoN0A4ddGKEU2n8wjYsuTUst6/HLkAJo7Lcflp6dxQTvl41lB74/0I2pByFyXF/ciLBQjjzp3k48/vqxZxc
gE8s2vAO5LVEF/oll3cNZQBkmrgJyn1pADhwvnTyHVqxPZch6rqQigWoPRMFsepPm4IMkDSyL9TI5U6JI/uF8zuYel7ZzJxXG5
oW3dXjqVnzazqSLLU7MIzWRynurhrKAMkKc5BM7pynSNiBMVG95W6D8rxPy+cPy02RpDHM1kcp7r4jCADJCnOfNZOmiye0VBue
8Z8dlF3V27EPs9kcZzq41lDGaDR5QNGU1rCM1kcpzp41lDGaXSRtdGsWq11JosbGsdxQ5AZGpka2KylJZqlGmrWcOPbfHiMIMP
Ua/Vus65a9UJr9afceJFTH3xGkFHqORputGsqiXJdVu02km3E9ZS7iNGpD24IMkq9f5DNuGq1HJdVu7mRGnU9XuW0OXHXUEbxH
2R5Lqt2cyM16nq8ymlzUtIQSDpL0n7h48sk3S7p9bUXzSmHcv39/oMsrxpquxnORl1Ps8aLsk4a19D/NLMfSHoLMB/4EvB14Pi
aSuakppJpftzq3Sz+INO6rJo186lSGnU9zRovyjppXEN5TXEq8HUz+z/A2NqJ5JRLJdP8ckbDTvuNZBt5PQtm93DvonlsWXIq9
y6a59+5JiDNjKBX0r8C7wT+UdIr8NhCU1HpNL8ZA7jNSruNZNvtepzRkcYQvA84GfiSmfVJOhhYmObkkk4GvgJ0At80syUxx7w
duBrIAU+Z2dtSSe4M0W5ui3IYTQ/lcmk3w9lu1+NUThpDcDCwwsz+GCrtY4Fvl3qRpE7ga8C7gO3Ag5KWm9mjkWO6gWuAk81sq
6RXlX0FTkX+/nbIic/3UI62z8z3UIbWTOt0nEaQxsVzGzAo6dXAt4CpwPdTvO6NwCYz22xmu4GbgDMKjvkAcLuZbQUws9+nltw
Zolx/f7us7hxtD2XHcQLSzAj2mtkeSe8Brjaz/y1pbYrX9QDbIs+3MzLT6DVATtJPgP2Ar5jZiNmGpAuACwCmTJmS4q2zRznT/
HZZ3VksBtKqaZ2O0wjSzAgGJJ0DfBj4YbhtZKH4kcS1vyocvo0BjiPISJoP/E9JrxnxIrPrzGyOmc2ZNGlSird2itEuOfHFYiB
ZiI84TrVIYwg+CrwJ+Hsz2yJpKvDdFK/bDhwaeX4IsCPmmB+Z2Ytm9hRwDzAzxbnLpl4F1lqBUovJWuVe1auHsuO0O6ka00gaS
+DGAdhoZgMpXjMG+A3wDqAXeBD4gJltiBzzWuCrBLOBscADwPvN7JGk81bSmKbRjVmajbj7IYLp2sRxOV54aQ8De1/+XjTzvap
n1pDjtDKjakwTZgr9O/A4gb44VNL/MLN7ir0ujCtcBKwkSB+93sw2SLow3H+tmf1a0o+Ah4C9BCmmiUagUtrFJ14tojnkvX39Q
0YAGFKoUZr5XnkKpOOMnjTB4i8DJ5nZRoDQh38jgW+/KGZ2J3BnwbZrC54vBZamFbgS2sUnXk3yCjSpjWQhWb5XjtPupDEEubw
RADCz30hKEyxuGrK84KoUaRV8O92rdlhD4TjVJE2weI2kb0l6e/j3DWBNrQWrJu1WJ6aapFHw7XSv2mUNheNUkzSG4EJgA/A3w
CeBR8NtLcOC2T2ceVwPnQoyTDolzjzOfcsQbyRznaK7K5j0dUpDMYJ2UJbt1lfAcapBUdeQpA5gjZm9Dvjn+ohUfZat7eXmB7Y
xGGZIDZpx8wPbmHPYAZk3BknFx4CGdeRatraXxcs30NcfBK4njstx+WnVyQSqZ7zIXVBOq1DUEJjZXknrJU3Jl4FoRRYv3zAsH
RKCMgSLl2/wHybxmTdzl6yqSqZVKWVYuP/E6ZO4+YFtwz6vZ3YNsPDW6tQPqle8qN1aWzrtTRrX0MHABkk/lrQ8/1drwapJfmS
ZdrtTnZFzvihc1B+/8Nb1Qy6mOH/99+7bOsJoAwwMVqd+UL3iRe6CclqJNFlDV9RcCqdhJI3YqzFyvuKODSOKwg0MGlfcEczE4
pRlseWN1XDf1KsOv6csO61ESUNgZj+thyC1ZOK4XOxCqYnjWioLtuoUc19Uo5Vl3D2Pbi9XKVbLfVOPRWijNaQeX3DqSaJrSNJ
5khZGnm+X9Jyk5yV9vD7iVYfLT5sxoiZNrlNcftqMBknUHJRacX3le44Zyh4C2CdX3cZ05Sj2XGdr1Q8ajQvKU1ydelPsl30hc
H3k+U4z2x+YBJxTU6mqzILZPSx978xh9fqXvndm5kdYSSPy3r5+5i5ZxaduXjcsjvLMroGyFFLUiMRtT1KWHzxhyrDXThyXa7n
PazQ9oT2+4NSbYq6hDjP7Q+T5DwDM7CVJLbfM1GvSjCTJfSFILDtRTubQ4tNnsPAH64cFf3MdYvHpwUysmL/+iwuOqeCKmotKv
3MeX3DqTTFDMCH6xMz+AYbWFryylkI5tSEuVfO2Nb2xVUiLkVYhpQnMVsNAt5s/3UuiOPWmmCG4S9IXzeyygu1fAO6qoUxOSsp
RgHGB4e/et5VxuQ66u3I82z+QqIAKKUch1WImFr3uCV05Xty9Zyg7qR3y9asRqHeccihmCBYC35S0CVgfbpsJrAbOr7VgTjKFN
fihtAKM8zsD7BrYiyGuOntWqmqkgiGF1IiReKFBi1sL0sxls9NQrxRXx8mTaAjM7EXgHElHAPn0mkfN7L/rIpkTS1xTmTyFCjC
qqIu5e6KvixuN5hFw7glTWDC7p2ErZ5MMWiGt7k/3mJZTT9KsI9gMbK6DLJkm7ei6lCLMK8BiBqPY6wqb1nRKDJrRUyBTo5r9Z
LFstuPUmjQri50aU87oupQizCvAtCPnPN2RxXVpRqONymxJE8dwf7rjlEd1Vwg5FZE0ur74lvUjcvaLjXSjCrBchZyidXUqOTq
kmi58ii2b3SEmjsvF5usvW9vL3CWrmLpoBXOXrPJFWY4TQ6oZgaRO4KDo8a1cjbTZSFLag2YjZgZJPvzCpu1pM4DyPFtmAb4kO
eJkriblBFK9AqjjpCNN8/pPAJcDvyNoMA9BqvmxNZQrUxRT2oV+97SKsFjQN0mGcsi/38W3rB/q85Akc7VJG0htVBzDcVqNNDO
CTwLTClYZO1WklNIunDGkUYT5/dEGL0lU6lNfMLuHT9+8LnZfueWqa5Eq6St0HScdaWIE24Bnay1IlsnXpcm30iyk0gyYBbN7W
Hf5SVx99qxhNW8+eMKUimrgRMn73pNCC+VU2axVgbUkGTyjyHGGk2ZGsBn4iaQVwB/zG82sZVtXNiN5RVyLFaXVzkkvlZoq4MT
pk1Kdq5buG1+h6zjpSGMItoZ/Y8M/p0bE5fBHq06WUoyFK44LA8hpKeWqKZWaasBta3pT9YSupfvGV+g6Tjpk5eYNNpg5c+bY6
tWrGy1GTYkbcXflOou6cPJtIQs7guU6xNKz0pdwTvPeUxetKFmYDgK3072L5hU9JqmkxcRxOcaNHVP38hVuNJx2RdIaM5sTty9
N1tAdjCxI+SxBzaF/NbOXRi+iE6USd8nSlRtHGAGAgb2WWHYiquzy2+OUcuF7p01NTTOqj3Pf5DrFCy/tGZrZ1CPt01NNnSyTJ
li8GXgB+Eb49xxBKulrwudOlanEXZJmX1Jg9rJlDw9tT3P+uEVdcRiUXMQV18Bl37FjRjSwr3VjFm8G42SZNDGC2Wb21sjzOyT
dY2ZvlbShVoJlmUrq0RcbpRcrO9E/MMiN928bsRag2HsX+t67x+V44aU9I5Q3pBtZFwazpy5aEXtcLdM+PdXUyTJpZgSTJE3JP
wkfHxg+3V0TqTJO0oj7xT/uSRxdL5w/bURfZghiBKXKTpQyAtFz5Fkwu4d7F81jy5JTWfv5k1h6VtAKNI60I+tyU1KrWT7CU02
dLJPGEFwM/FzS3ZJ+AvwMWChpX+DfaylcrWj2+jN5d8nEccN7/vb1J/cMzvdljr6muys3LFBcqVIbv8+YVAvY7l00j/iVEKVH1
lG3VRyFKanVXn8wmmbzjtPqpClDfaeko4DpBL/HxyIB4qtrKFtNaJWg4ILZPSxduXFY8xkoHjQutV6g3LITefoKZChGpW0Wy01
Jrfb6A081dbJMoiGQNM/MVkl6T8GuIyRhZrfXWLaa0Er1Z5JG0b19/Sxb21u2vMXqAxWjnJlEpYu40vjio59TNXz6cRlUpdJdH
acdKTYjeBuwCjgtZp8BJQ2BpJOBrwCdwDfNbEnCcW8A7gPONrNbS513NLRSULBYAPjS2x9m9RNPc/djO8sawRarDxRHrnNkfKD
U+aH8kXW5KamjbfDeKjNDx6kHxVpVXh7+/2glJw5LV38NeBewHXhQ0nIzezTmuH8EVlbyPuUyWgVST4q5cvoHBvnefVuHAqu9f
ff18+uZ1rH7iab644Jiii6PKKlFdwXrDJBdVMZnSuq3yn9Noy0e00szQcWpNmgVlBwH/AEw2s1MkHQ28ycy+VeKlbwQ2ha0ukXQ
TcAbwaMFxnwBuA95QrvCV0Er1Z/IK6VMJI/hCHW3A9+4L2kTctqZ3xGg3P4Po7etHMa+PI78gDUbnPy81Ak+Tkhr9nEbr02+lm
aHj1JqSJSYk/Sfwb8DnzGympDHAWjM7psTr3gucbGbnh88/BBxvZhdFjukBvg/MA74F/LCUa6gaJSbKLSXQ6NIDSWUYksj3GS4
krfKPoyvXWVbJi0KSrqFYGYpa3vdK5HGcVmZUJSaAA83sFkmXApjZHklp0k7iMgkL9dDVwCVmNqiEEswAki4ALgCYMmVK4nFJj
CYo2Ay+5BOnTxrmBipFUiA4bmsa45AvfhelXDdKJSPwaldNjdJKM0PHqTVp1hG8KOmVhPpC0gmk60+wHTg08vwQYEfBMXOAmyQ
9DrwXuEbSgsITmdl1ZjbHzOZMmpSuvHGe0eabN7r0wGXLHi7LCACJfQ3iMEhcCJYnybCkcaNUq29BtYkrbVFJXwbHaQfSzAg+A
ywHjpR0LzCJQGmX4kHgKElTgV7g/cAHogeY2dT8Y0k3ELiGlqWSPCWjDQo20pe8bG1v2UagK9fJmcf1DIsRQPLIP+8KKVUFtJw
Ae7SAXbEZR9wIvJ5uuFrOOBynlShqCMKMnreFf9MI9MlGMyu5wih0IV1EkA3UCVxvZhskXRjuv3a0wqdhtIq83llGUUXYIaUyA
p0Se82GKc45hx0wrK/BoNkIpRxVxEmukstPmwGkb5hT6EpLkr8nRsk3gxvOcbJIUUMQ+u7PMLOrgLILzJnZncCdBdtiDYCZfaT
c86dhtIq8nr7kQkWYZtFXUtA2ruOZ8fLMoFARp8nCSdpXaLxKyS2IjdF4SqfjNIY0rqF7JX0VuBl4Mb/RzH5VM6mqSJwiL6eVY
j1LD5Qqs1BIT3cXJ06fxNKVG/n0zetG9BeIW0GcNwJxiriYq6TY2oByjVeSEfaUTsdpDGkMwZvD/1+IbDOClM+mZ8HsHlY/8fQ
wX3s03/6LC4pmwQ6dox4j0jQKT8C5J0wZWjRW6Er51M3r+LvbH2Jg0EYV5E1Lucar2GyqlRb7OU47kabo3In1EKSW3P3YzsTFV
2n66lZKuYHPJEUYFwOAZCW8a2BvUbmqqVjTGq84d1QhntLpOI2hZPqopAmS/lnS6vDvy5Im1EO4apGkrAwqTgMtVcq6krTVpFL
I5xx/KJO7u9jR18/SlRuHzlHJyF6hLNUqv51kVDqlobTMq86exeNLTuXeRfOKGkJP6XScxpDGNXQ98AjwvvD5hwhWGhdWJW1ai
tXWqUSZpsluqTTwuU+uY+h13V05Zkzeb0RNofx7lVUzKCR6noW3rh8mcyUkjeIrVeCe0uk49SfNgrIjzexyM9sc/l0BHFFrwar
JwvnTEhumVOImSbPIrNzA57K1vSy8df2w/gPP/3EP9/730yPcWvn3Sts7OImBQeOKO0bXbdRH8Y7T+qSZEfRLeouZ/RxA0lygp
dI44gLGULn/uVifgLlLVhVNo0wyPFfcsYGBweHHD8b0AI6+V94gSVBGe4FhPLNroKxYRtKxrvgdp3VJMyO4EPiapMfDUhBfBf6
yplLVgC8uOIarzp5VlZFrkjLP+9+N+DTKYv75wk5kpcifCwIjkOtIX1aikLSxjGq3h3QcpzlIrD4qaYqZbY083x/AzJ6rk2yxV

KP66GgpjBFAcgmHYqt6o4bo8EUrRi1XUtXRSohba+AVOx2ndSlWfbTYjGBZ5AS3mdlzjTYCzUKcXzxJ/e41i91fGFPo7soxWgb
NRhUziBLn/vIFX47TnhQzBFFfQ0sFh+vBgtk93LtoHlvCtMikCp75tM84oqPrxafPGOHeyXWID54wZcjglKoqmnd35WWp3FkU7
/5KcolVui6hVAqu4zj1oZghsITHTgxJawAWzp/GuLHJo/S88lswu4elZ80cNstYetZMvrjgmCGDs7eI2ycfM7j4lvX09vXT093
FuREjMi4X/1HPPfKARLnLucZy8XiD4zQPxWIEgwS1hQR0AbvyuwAzs/3rImEB9Y4RVCOjZuqiFUWrcKb1r5fbqSxfkjrf4L4r1
0H/nr2YBbOLc44/tGh/47jtUJ26Sx5vcJz6UlGHMjOrjrO5halWWeRi06ly/OtxncqK1fsvbHC/a2Bv7GKvuPTPpGu/8j3HVEV
Re7zBcZqHNOmjbUda33Q53cniXB2funkds79wF8Vc+2n963GdytK0mSwVpE4i6dovvmV9VXz61Y43OI5TOWkWlLUVSSPd1U88P
eRCybs8ktwwvX39TF20YphrJKkA3DO7BuhQssKO+teLuWjiOpUZlaWMphl1Jx2Tf6/RNo1pdIG5enZCc5xmJ3OGIGmkG1fPp9i
IOxrghOLKda9BrgMKi4LmOl+eKiSVlF68fMPQ+8WRTxktpxR0mlF3mjpGo2kaU88+D4V4JzTHGU5isLhZGW2wuFjgtlJGs5Brt
IvA8qWdC9tSdnfleO6lAQqrVOQ6xdL3zoztLlY4CykcscchYMuSUyuWvxF4oNrJIhUFi9uVSip2lmI0inw0rxUk1vqZu2QVff0
jy1bsO3bMMCOQpopqJbWTmhkPVDvOcDIXLI7LhU+K5U4cl6vKSt1a3OR8p7K4bJ9iaabPRoxDqWB4dNHcl983s2prCBqNB6odZ
ziZmxHE+aZPnD6J29b0jghcXn7ajGHHdo/L8cJLexgoUhU0T0+4onhydxdPPttflSV50XOeOH0Sdz+2cyhofeL0Sax46MmSxeu
iyq6ckXEjffrVptGBasdpNjJjCC5b9jA33r+NQbNhi6nyzDnsgEQlF1V2eZ96MfdSoa+5GgXlurtyQ+eMc+l8976txV4OjFR2x
XoEt3O56XYyao5TDTIRLL5s2cOxivKDYRP4Skhyvwi46uxZw5TKaA1BrkMsPevlAG+5K4whvl9wXEA4vxo5bobkDWccp3WptPp
o2/C9hNFy0vY0JMUaon77vL++EvJxi3zNoagCrsQIxPULTuoudvdjO1MvpHMcp/XJhGuo2FqASinlXkibfpnE5IRUxnJX85byf
ce5ez5987rYY4u12XQ3i+O0LpkwBNUmLk7Q29fP5/7j5dTLxcs3VGwEIFC6hQo2H9ROS3dXjsWnzyhLKS9b21tWqqgvznKc1ic
TMYJiPvqrz55V1mh22dpeFv5gfWLmUIegUyNXEZfLxHE5XhrYW5Yx6ZTYa1bxqLzYLCYpRuCLsxynNcj8grKJ43KxaZX7ju0se
zR76e0PFU0f3WuMWM1bCX39A2U1pBfB4rS4oHBakuoldUqJgWJfnOU4rU8mgsWnHntw7HYzKysoumxtL/2jHeqnpNyJWmGdpEo
qgyYp771miYbFF2c5TuuTCUNw92M7Y7fvSlDqSQqxVbJm0mb4FJbjnpDQN7mYUq9m1zLHcRpDJlxD5bopkhRftWsU1ZJS1xwX5
M11ilyHhrm+4pR6YRA72gXNs4Ycp/XIhCFIWkHb3ZXjj3v2pi41MNpKofWkQ2LZ2t5EhRwXDxgYNCaOyzFu7JhEpR5nQG5b0+u
LzRynhcmEIYhr8diV62Tx6cNrCZUazTajEdh3bCe7dg+OWBMxaFY08J00Y+jbNcDaz5+U+H7FCtW5IXCc1qSmhkDSycBXgE7gm
2a2pGD/ucAl4dMXgI+b2fpqyrBsbS83P7hthKI887iXF1KlbUaflH3USHbv2Vu0Z3GSgi5WZ6gYjcwS8oVrjlMbahYsltQJfA0
4BTgaOEfS0QWHbQHeZmbHAv8LuK7aclxxxwYGBkeqytvXbC/6umVre1l46/phPYif7R8Y1lWsGShVCTVJQVca5G1UllBcT+hKs
6McxxlOLWcEbwQ2mdlmAEk3AWcAj+YPMLNfRI6/Dzik2kIkjeB3Dewd8qFHR5oTunJI8a/ba7BPh3jVfvu0TOC4e1x8JlClFTg
bVcLZXVKOUztqaQh6gG2R59uB44scfx7wn3E7JF0AXAAwZcqUasnHFXcE/YCjii2uq1eUXQN72VVFIyDBPmPK6zlcDn39A0M9C
woVfSVlpRtVwtkXrjlO7ailIYjzocT6MSSdSGAI3hK338yuI3QbzZkzp6yIbXdXLlG5P7NrIHE1bb049/jAsBUGs6tFPr4dt2q
6Up97I/oSVBrTcBynNLVcULYdODTy/BBgR+FBko4FvgmcYWZ/qLYQ+cygJBo1opSCfghzDjuAG+8fGcyuBdGFZq3mc/eFa45TO
2ppCB4EjpI0VdJY4P3A8ugBkqYAtwMfMrPf1EKIBbN7yCVcZVeuo2EjyskTgve99PaH65qWmjd8pfoVNxtJvRM8PuA4o6dmriE
z2yPpImAlQfro9Wa2QdKF4f5rgc8DrwSukQSwJ6k63mgYv0982uc+4YhyNH0DKiVte8lqkzd8rehzb5dWmY7TbNR0HYGZ3QncW
bDt2sjj84HzaykDBIukim1/xZiOIUMwtlPsjkk3bQeirhT3uTuOkycTReeSlFtXroNLb394WDC5s6ODcUm+pBaiuyvH3CMPoDO
YadEpDVtE5z53x3HytL7GS8GJ0yfFbt8V0/ilf2CQsWM6RyjJVqGnu4urz57F4tNn8Kutzw7FHwbNuG1N71Aw2H3ujuPkyUSto
R+uf7Ks45/tH+Cqs2fxqYTevc2KYKgr2Nwlq0ouwHKfu+M4kJEZQalFYoVM7u5qSQUZdYElBX1bZUW04zj1o+1nBOXmxef95M2
aT59EV66TE6dPYu6SVezo609sQC+ILa3hRdwcJ7u0vSFIkxdf2PQdGFqFW0v2HdvJ7j17hxWOEwnLrwvoEEzoytG3a4DJ3V2cO
H0St63pHXIHJa1NMF6+J+X2a3Ycpz1pe9dQqbz4XIfYv2u4PaxX2YkXdw8ydkwH3WGLyLRGAIICeOPGjmHLklO5d9E87n5sZ2q
Zd/T1t9yCMsdxakfbzwgmFKk1BECk0mhvX3/dA8Qv7h6kKxeksvYn9FBOYkdf/5B7pxzf/+TurpZcUOY4Tm1o+xnB7j3FR8lxv
QrqTf/AYNlGACDXqaF6QUkUVv7Lx0Aa1VfAcZzmo+0Nwa4KFGyrsHvQirqDunKdnHvClNi1Ar6gzHGcPG3vGsoqPSWygBrVV8B
xnOZD1oQN2YsxZ84cW716derjD1+0oobSNCfdXTn2fcUYV/CO4wwhaU1SUU+fEbQZuQ7x4u49QwFyTwt1HKcUbR8jyBKdEuP3G
TMiAO5poY7jFMMNQZsg4MvvmxnbdwG8tITjOMm4IWgTDPh0kTUQ+XLUjuM4hbghaCOKhf3r2Q7TcZzWwg1BRujxhWKO4yTQ9oa
gHRwi3V05cp2VX4kvFHMcpxhtbwjawSGy7yvGcPYbDq14VO+dxxzHKUbbG4J2oLevn9vW9LJw/rSyZzg9Ldpkx3Gc+uGGoEXIr
wUopyicwF1CjuOUxA1BC7Gjrz+2WFwShq8mdhynNF5iooWI9lLOF4vrynUkVlj1TCHHcdLghqBFiGb+RI1B0ophdws5jpMWNwQ
tgIAzj+sZMgDL1vYO6zcch7uFHMdJi8cIWgAD7n5s59DzND2V3S3kOE5a3BC0CNFewqX6CvsCMsdxysFdQy1CNG10cndXYmygV
GeyYixb29v0HctaQcZ2J81n4J9Tdan1/XRD0CKcOH3S0OOF86eNiBF05TpHtYK4MO7QjA1tWkHGdifNZ+CfU3Wpx/1011CLEI0
RLJjdw5XvOSa2KX2lxMUdmq2hTSvI2O6k+Qz8c6ou9bifPiNoEQrjAgtm91R1dJUUdygVj6gnrSBju5PmM/DPqbrU437WdEYg6
WRJGyVtkrQoZr8k/Uu4/yFJr6+lPM1OsTpC5ZSWqISk89f6fcuhFWRsd9J8Bv45VZd63M+aGQJJncDXgFOAo4FzJB1dcNgpwFH
h3wXA12slTzPR093F1WfP4uqzZw1z71wVbissIVGPLKC40hXNln3UCjK2O2k+A/+cqks97mctXUNvBDaZ2WYASTcBZwCPRo45A
/i2mRlwn6RuSQeb2ZM1lKvh3Lto3tDjJPdOvTMuCktXNGOmRyvI2O6k+Qz8c6ou9bifshq1MJT0XuBkMzs/fP4h4HgzuyhyzA+
BJWb28/D5j4FLzGx1wbkuIJgxMGXKlOOeeOKJ1HIcvmjFaC+lqnR35Vh3+UmNFsNxnIwhaY2ZzYnbV8sYQZzLu9DqpDkGM7vOz
OaY2ZxJkybFvKT5mDguR65j+OXlOsTi02c0SCLHcZx4auka2g4cGnl+CLCjgmNajq5cJ5efFih8nx47jtPs1NIQPAgcJWkq0Au
8H/hAwTHLgYvC+MHxwLPVjg88vuTUuriHOiUGzUas7HXF7zhOs1MzQ2BmeyRdBKwEOoHrzWyDpAvD/dcCdwLvBjYBu4CP1kKWx
5ecWovTOo7jtAU1XVBmZncSKPvotmsjjw3461rK4DiO4xTHS0w4juNkHDcEjuM4GccNgeM4TsZxQ+A4jpNxarayuFZI2gmkX1o
8nAOBp6ooTivi98DvAfg9gOzdg8PMLHZFbssZgtEgaXXSEuus4PfA7wH4PQC/B1HcNeQ4jpNx3BA4juNknKwZgusaLUAT4PfA7
wH4PQC/B0NkKkbgOI7jjCRrMwLHcRynADcEjuM4GSczhkDSyZI2StokaVGj5ak3kg6VdLekX0vaIOmTjZapUUjqlLQ27JCXOcK
WsLdKeiz8Pryp0TLVG0mfDn8Hj0i6UdI+jZapkWTCEEjqBL4GnAIcDZwj6ejGSlV39gAXm9lrgROAv87gPcjzSeDXjRaigXwF+
JGZTQdmkrF7IakH+Btgjpm9jqBM/vsbK1VjyYQhAN4IbDKzzWa2G7gJOKPBMtUVM3vSzH4VPn6e4Mefua45kg4BTgW+2WhZGoG
k/YG3At8CMLPdZtbXUKEawxigS9IYYBxt0BlxNGTFEPQA2yLPt5NBJZhH0uHAbOD+BovSCK4GPgvsbbAcjeIIYCfwb6F77JuS9
m20UPXEzHqBLwFbgScJOiPe1VipGktWDIFitmUyb1bSeOA24FNm9lyj5aknkv4M+L2ZrWm0LA1kDPB64OtmNht4EchUzEzSRAK
PwFRgMrCvpA82VqrGkhVDsB04NPL8EDI4FZSUIzAC3zOz2xstTwOYC5wu6XEC9+A8Sd9trEh1Zzuw3czys8FbCQxDlngnsMXMd
prZAHA78OYGy9RQsmIIHgSOkjRV0liCwNDyBstUVySJwC/8azP750bL0wjM7FIzO8TMDif4Dqwys0yNBM3st8A2SdPCTe8AHm2
gSI1gK3CCpHHh7+IdZCxgXkhNexY3C2a2R9JFwEqCDIHrzWxDg8WqN3OBDwEPS1oXbvu7sK+0ky0+AXwvHBRtBj7aYHnqipndL
+lW4FcE2XRryXi5CS8x4TiOk3Gy4hpyHMdxEnBD4DiOk3HcEDiOk2QcNwSO4zgZxEyhEyPpekUlaKeQTGBTMbBJ4tKrz0OYJZx6vMbHK4+QEz21Liun4JfC7ss3B7aMAeBr4k6R+BH5rZz1LI67QOHUC
fmc2K2XceYTzBzH4Zdl47EPh9qRM6Tksj6QhgkODLHldyPM8fI4/3Rp7vJRgUDf3AIn+vBTCzCwkCcYcC6yS9cpRiPwrMzAe5z
ezvwx/2/pFjXow8jr0uM/s+cDrQD6yUNM/MfgMcR2DgrgxnLk6bYEH5+C2SzoKgoKSkmeHurQRF9JD0WoLZ785S53RD4LQ0kiY

B1xL45o3Af39uuO81wBRgY5pzFfuBSTrSzO43s88DTxEYhOeB/RJO92Pg4+FrO8POYNH32gSsBr6YDwaHo7ckQxZ7XaER3Gxm/
0JQUfdYSZOBXWb2XYIGLFkrM91WSLqRYOY3TdJ2SecRfBfOk7Qe2MDLHRcvBj4Wbr8R+Ej4uyiKu4acVqQrrKCaI6ge+R0gX1r
7GuDa0D2yh+CH8MeIq6cU5wJfl3RZeP6bCIKuSyUdRaCofxxu2wosCmW5suA8nwSuC3+0gwRG4ZcFx5wPLAU2SXqaYFR/SYJcS
dd1NvBBSQPAb4EvAG8I5d0LDITv7bQoZnZOwq4RKaVm9ihBpeGy8OqjjuM4GcddQ47jOBnHDYHjOE7GcUPgOI6TcdwQOI7jZBw
3BI7jOBnHDYHjOE7GcUPgOI6Tcf4/qZgDB6lwInYAAAAASUVORK5CYII=",
"text/plain": [
"<Figure size 432x288 with 1 Axes>"
]
},
"metadata": {
"needs_background": "light"
},
"output_type": "display_data"
}
],
"source": [
"plt.scatter(bom_mov_clean1['domestic_gross'], bom_mov_clean1['foreign_gross'])\n",
"plt.title('Domestic Gross vs Foreign Gross')\n",
"plt.xlabel('Domestic Gross')\n",
"plt.ylabel('Foreign Gross')\n",
"plt.show()"
]
},
{
"cell_type": "code",
"execution_count": null,
"metadata": {},
"outputs": [],
"source": []
},
{
"cell_type": "markdown",
"metadata": {},
"source": [
"<p> 1e8 represents 100,000,000(one hundred million) 1 x 10^8</p>\n",
"\n",
"1e9 reps 1 billion 1 x 10^9"
]
},
{
"cell_type": "markdown",
"metadata": {},
"source": [
"4. Gross revenue by year"
]
},
{
"cell_type": "code",
"execution_count": 50,
"metadata": {},
"outputs": [
{
"data": {
"image/png":
"iVBORw0KGgoAAAANSUhEUgAAAtwAAAHtCAYAAAAqZ6n8AAAAOXRFWHRTb2Z0d2FyZQBNYXRwbG90bGliIHZlcnNpb24zLjMuM
SwgaHR0cHM6Ly9tYXRwbG90bGliLm9yZy/d3fzzAAAACXBIWXMAAAsTAAALEwEAmpwYAABco0lEQVR4nO3df3xU133n//dnNCC
BwBjZGGzED3cdtkJyU9fstovZFIUYihsTkjJx7RJDMELKWNNanCDsSvbiexKKNA6cgMxcYKd2BT8RcJdwnZbO21dj
OLE9a9Qxz/BMQhL6Mf5/jE/rAHNaAbP1b0jXs/HYx5irjQznzncf05537OO55537Oo6Eu74&OeacEwAAAABvhPwOAAAAABjNSLgBAAAD5FwAwA
AB4i4QYAAAA8RMINAAAAeIiEGwAAAPAQCTcABISZzTSzk2ZW4XcspWbWBmXXzSzb/odBwD4jYQbwKhjZs+b2dtmdsLM3jSzQ2a2x
swCdcxLxfmB9H3n3IvOuQnWnb2USt7fDCBbxXZz16NPtSbnAekgmSXpyRNf/xf5y/11YJpzGo64kZwKhsaKbYo6N8dmfsfDSfe9NlPWcdmsXkkB8Jm8YX8+twtGWXKNmQLh7Np4xzuBcFz3O3pRc51JNX88bbEOcgezUmqHdH7P83Xo3Kzz6hUGyAaIXj6j4cW7d81Z2+Dg/E37D6dwyD1Eh86XSGa6EzJUlLdw8aTUjzUJxcfW5+b3YO/2Nc2nQP7N48pKxgcXwZyxYFDxPb4XjY91rRHgw0DqjDkKvl+vI6LOi6UtTIVRVgLR+Kb4pqSXOMcCGcDA9rGh89X1Hl0DqLOOcnRd6y/9AYcTWmRHQN/+/FPg5iQuOzNNsZ8G7hRpC6y+fqW9pK5PuCxSXbalLr6u/Q9JR2ACfPAvPXGCH4dMjrcUKvzSxtk3/2x+LvG6kgNf5gDXpBtx/3SNXc/rDwp1HfL/vFV5sWLzIZg/0Rb6pu/V0M8zDZQkHNf/dfk/GVXoIoGRnrmzUP4lGXXuFp/0TO/BHX7u6ITecmJ5HjJ1ST/sGU4E+3mIkyRzoftBCCSmXzb7LtC6+c0NS+m7xwMgQnrBK3l6G0aVR7zTyVb3w6DxYzwAhixUtUTXmMXgmo+DKaFdxdE0V8cgU9CO3dpzB9CMRymFVTTXbwf7nSPLNg40WbEUj1ZCN0p8XQkyG5t/fSVUtVyEgOP6xIS1Nc6qtkU9wo6zV+wAXWUUKtDqLDm9U3Yli4E2ylBBavirRp/4o+fkarzxtvcRAjBTPEUQvO8gvzvc9H8CEPpPsyLhuoxQAAaMJULIRHDmU5aZmAETa9Q0dMmt0h+0yo2/jbrSJoVlHKEYrQ60+Khd4tFQ5hjIJTb/EaSdRzehYrC5YJ+RrchgY+9NzjP0pIikaMfx/OQu4HX1HyBzQPe6clHeIGt1TK9LvIm5Hj8JJGVcjXtwzuFeMDg2e/ur5bVsWRbMiSvXAwZCx+O2HoYj8Ib/kW7pyDTG5z3DmJpCvXaZVeS0eOn8Zd8fEgj1N04G4jy07AC9dv2CZzLuDN/cE2k7Sc3HT9DfXwCbuJu2+RIeR/AewhG1MoKnzWrPJNB5uKSGaU/AGm4k/QvF8sGVqqmSaPDiVS6n6ZXnR5Kr4tjyp2PQrN/d2BlWsA+w7kv+xGpnfy/PZ86I66xjfIcdDbAqtz2G8Wrd1Er7JSABtttdWhQwczdWXAtJlgkVnz6WrCbJJ4njWKXrKYcx5LYp+4/5SOz6ErVjx0q7hA1HTxOwPX3JOrqfl0wRpajKFyEhTavI9GQEYaXrgyt8KnAGwXJAyUnXKK92ksvFgNTmFn0YmPxGAEXMcaCMkaRPZcT6vVyqeXoW6x6u9Vsb3ejklxZ+bRahNazHmWmKSZwsXVVBW2UgOJVX45eFD8WJS2iA7wIMgtOKbD
0gZL/t39lZr8x6GmnpR43K/WcAOCJwCXcZrYr1dNyuIC/nWlmHWb2z2b2pJldNxIxAihbL0mqseSgxI9LutU5d8I597ykrZL+a

NDfPpfqIe6XdL+Sief/cs71OOf2STot6QozM0mrJf2pc+6Yc+6EpC9J+oPU8/RKulTSLOdcr3Pu/zjn3HCBpmqTl0pa45w7nnr
sYzn+/GJJLw967LJUj+8JM9t3xt9+0TnX5Zx7W9IKSducc886505KulXSH6SS314lE+0rnHP9zrknnHNvpZ5jQFKDmY1zzv3CO
fdUnrfyhHPuu865XknbJFVJ+q1UKcjfS/po6u9+R9Lrzrkn8jzXH0t6v5L/Dy8qeeLziHPuEefcgHPuUUmPS7pOkpxzDw/q8X9
M0j69c8KVfh9fSP2fvp3ndQQHgXQlcwi3p60oeeeAvxeUnfds5dpeSX21e9CgrAqDBd0jElE9Sxkl4Y9LsXUr9Pe2XQv9+WJOfcm
dsmKNlzPV7SE6kk901Jf5faLkl/KekZSftSZQ2bCox1hqRjzrnjBfztG0om9rF+ZBz7kIlS03GnvG3Px/078t0dhuEleyJ/4a
kvZLuS5W0bDazMc65LiVPVtZI+oWZPz5B2ZmXi/VA3809bqSdI+SSbNSP4fs3R70+FckvS4pneDPkvTRdLun2n6BUm1hZkvN7
B9SpTxvKpmIXzzoKV9zznXne00AKIXAJdzOub9X8gsxw8z+k5n9Zk9kap/TB/cnZKXXkXpRGXAGzsAx+Lkgn1QSWTtl4
lE7a0mZL+4xye+nUlk+9659yFqdsk59wESUr1oN/inPsVSddL2mBmi1KPzdfT/XMle+MvLCCG/ZKWW2GzsAx+zZd0dhv0SXol1
aP+P51zc5UsG/mgkmU3cs7tdc5dq2Ri+xMLb2bZDmDmMiP9j1R8tXrnwL1b0q9q9Zsq7+g5K+VUD8g/1c0jcGtfuFzrlq59ztZlYp6QF
JWyRNTZ2APCLJBj1+2CsNAFAKgUu4c7hLUtQ5d7WSNXrpnuwvvSvpDMzuaq5IE06k94AILKzC4wsw8qWYP9Tefcv6XKRL4tKW5mE
81slqQNStYVFyXVa7tTyr/grgS1KvOd3MlqT+/UEzS5eevCWpP3WjTkr5vyHGNkmTvyxHGNkmTJX0j1UFhZjZ
RyZryfBKS/tTMLk/Vo39J0v3OuzT4zazaSzK1PlN28peYLSb2ZTUyUr1ZJ6JJ0c9H6GcrWZfSRVpvInqcf8Q+o9dkv6rpK13f+YK
hMpxjclXW9mS8ysIjXQc6GZ1sl8TVJfa2VNLiIp8fAEoi8Al36ktgvqvTvmNm/SPqa3rl/SRgC2H9KU3edP/tySAPgPgNH
vB2Z2Qsle0JiSSengZQZFRSV2SnlWy17tN0q4zn6RATUqWjfyfyDmb0l6T9J9Tv3tP6v5JSf9X0ledcwSv/uypM+nyiE+yiE+O8Tz/
pGSie5PlBwA+CdDvbhz7nVJvyWpWpO/VeTig5kHGipLV54t6lZBnH30t6LvX4dMfFNCWT4bckdSo5xeA3lfzeuEXJupjSg7C/Ey
e13hQyRKU46n385FUPXfaZKu1DDlJENxzv1cyUGZtymUZGZtymZWP9c0uckhVK19DcreWJ1XNINkh4q9jUAo8BSSgLE7I87MZkv6oXOuw
cwukPS0c+6sxQ7M7D1JS5zzu5NLJvnM1Myp6lp/yMKIWSkbGvCWi0pOUYAw4iQWASBAIIVMZLRDHmVgI02tQyv92OSPUDrvzDRQjPd
vr/kSKACgKKkrkhsk3UeyDWA0C1wPt5k9KWJK5RR2GZkjF0Y4aEEpUk9U8jEebWxrf9XaN6Ezil1Uw/F8aT8AJmtBSqqSrBxDtFhDDRhSDBfgrSs6Mk
rlSCQCjUeASbgAAAGA0CXxJCQAAAFDOSLgBAAAAD4X9DmCwiy++2M2ePdvvvMM7S1dWl6upqrR8MoK7RZ8Wiz4tBexaPNikebFY8
2Kx5tVpwgt9cTTzzxunNuypnbA5Vwz549W9u3b/e7GAXZsmWLFi5c6HcxgBEi7Hg0xFB5B+iaHHWRXDfj5CT80DOSI2lRmL
jslJQAAAICHSLgBAAAAD5FwAwAAAB4i4QYAAAA8RMINAAAAeIiEGwAAAPAQCTcAAAAgIRJuAAAAAwEMk3AAAAICHSLgBAAAAD5F
wAwAAAB4i4QYAAAA8RMINAAAAeIiEGwAAAPAQCTcAAAgdIJBJqaGjQokWL1NDQoEQi4XdIAMpY2O8AAAAAAAABAMpXOPOmyc2myzpAUkfl
6uiokKrVq2SJEEUtzkKhwhwOOq7GxrYrH436emdCb2X8Sp8b7Jn8ugh7JPhwH1PNIudy/t0Vdm39+Hn8T+TPy0CFKKiHXXYtAL
MgY6nOFY0kk7R8Ue/CPQ0aUU0gNt4tGaYEQdJo3f6WsVlSI4ewp3nhBZhf5z1KcNmRZ9mYV9p3mdNntJPIwqUf3B8SUBm1W5dCR3S5cP
kk7U2NI31azu3ZK/n3RPcAVtTTzv7sZfkqPvFtzxnbzn9QfMA3vnNMvRSbt+JpidNnv1azWvqeaR9Wm6etV2Kuvc3TDmQvmmTsA6
6nyIqDgk3AAAAAi0Wi2nVqXXGM1FnnHcu+KyW7LhFiHJjApv39K0+0jv2jTR2RKxwEH7XvS/IeUJeZPnP2UH3Rq9yeb7ejH/fO
u+0CHiNUkY0D1z0qyGqGRaH7KjhNsk0NNxWTsBmsgdhFpvF7jt8Er18K3kHgTwpaEG4j5NmZ1b/B7Qwt1ipFMtKGABLUJGmpNdcJXr5Vq8HBXFnX+Ym3Yyq8S
mzHt4jtG3Bq4pBHAg1v3XtEUOdHh4U8hmgf8zTdZd6BdhYqu6rpvJmrHeeJZsN3P6Y3Tyu3cdRSGmYVtsbYbSMuHt+SiYWtt8z+eYjT7a
BgJBEPIhwQm+Agdaa3hU6bMGhPAsEXzn8Mas2hYmnP9ubQ7WjcMUvSGyX2LSVWXjX2hG4WijWbFWWqMtB8UvAFN7YbfcxwOUaDWi6Q
IhNuzGm7n3MuSfm5m/zm1aZGkI169HgAAAABBEXi98E5X0LTB+UiHS0/rZmbSF1vcxmr01MjTqJVjI/6ufvStrunHtQ0ljvQ
gIAAABGj0IS7v8ws69J+pikR8sDHQAQhLnj0naK+l3nnHvkefHdDvyQhhRSOG3BAAAeAz93gX9N+tKMdP/ZYN6gwMrLRHFl0+l9Sm0
iLZx0X9pvJ0KtD+k3jvvqMN9qGfTN2iS0yO6Ik5BIJRO1bYd1oM3GZ+xPvfvjmNS70AtV7e92zUkFVOezB5n8L0Z5sRL7tODAtLfMiqW
NVgXAMr3tFvtxz3+qN9Iyzr38wWRoU9AoIY7U8obW3T01+2uyRDDV8+P00X/F0xaUqfLTExbf3Wu0vM3z5bAcaoPdWF2vKm/Vmsk3QUxbS
ajzSfv3KBqyhV6TE8BxI8SU4+bYTT9cvHHI0H7F8FcFd1IKvQFpUt3N8wFhXbJ/4XP4T7ApeKVtlWcB4W+Cpei6U1Wd4xF2GiGvA1t8IOl
gAAAgNGikB7uByT1m9kVt0V3+Pz1oWevTmy5sCy2L23gSBW0uGDt0X7b0nVE+tqQKVe26LlnA0u5CpNHBZ6Xtn8xLvYpxb8CAk4w5T5c4xqUlBuwWAAM7vpdSA
o2qs7NTdXV1isfjDJgEUgpJuNdINDI+mNJNytZw/33kr7qZVAAAKC8RCIRRSIRHThwQAsXLvQ7HCBQ8ibcZhaS9LRzfGHbRUJKD9jhxmgt3Y3Y+zt6prkhcwGQDz4AK
AABg98tZwO+cGJP2rmc0oQZYnGzrSCAEBKEDF5fRA7BdkUT6DFKWDsHAT9OXMKlDMOWAXKT8f32rTQANGQOX8jU+AiOtAAMiAYBGQtiAYQcJbm1GIwutAiiBQl
NEqkUiooaFBixYtktuQsgfJSdFuAKLb5hBBsSJtsqdPDaY+WDJC02IjT1KeDeQBYWrcGJBtw1XXWvfubmaw0aJ2lAsIbRBGbPL+j9J++Vd58TlY1R9d7VbJdbbd5N3dghMH5R4ebQkTt4gIXXQAyT9GZlJCqwAnnI9o
SJKZTHIXy9XCvkbRr0P3XnHMXSJoiiT0BAADgHMXjcbW2tqbW2NXLHcGUVq6rV6i1uqfVlVyP73O77JQo4IF/CHXLOvTHo/nckyTnXLWmcp
1EBAACMYp2dnVqYwEHWtgULLFqizs9OniOClfAn3pMF3nHNfkjjJc/kZVAAAAAAAADA9f7QnxN2xPvbecUnQ/TIbdSKnbAFrFo8oALz/Mn62bvCL9kIcmNypsnd0j1WL1rKWjaIhy/4p3ntbL09MPw6/wlV3oAw3c/rdNDeNr1Tsj8GcvQ/TAy
+Yojt/0vSPo/iAQAAGPVisZhWrVqjo409fX1qaoOjQ6tWrVIsFvM7NNNHgg37SAn5P0t2b2jKR/TW17r6THJX3a68AAAABGq/TAy
Gg0qs70TtXV1SkejzgZcptK2cPtrOtyzkUkUZD09xzJ0cmPAAAUA6Y4q54kUhEhw8w8f1v79+X48S8Wx4iNsIo2VFs2IVvvNHP
PSnp2BGIBAABliCnugPyGXfgAAAgH6a4A/Ij4QYAAO8KU9wB+ZV8Jbb5Zb3obFgAAKBdMcQfkV0gP93Zgwd0M93ZJgwdJd
qW2AQAAMMUdMIxhB01KMuecS99xzg2YWSGAwAAAYmBLuqzxSuJQAAYBCmuANyPNyKyThXiNpvqT/KHRU0m9

KusnLoAAAAIDRopB5uF+V9AcjEAsAAAAw6uRMuM1so3Nus5m1SHJn/t45d7OnkQEAAACjQL4e7vTkmY+PRCAAAADAaJSzhts59
4PUP0855+4ZfJN0amTCAwBg5CUSCTU0NGjRokVqaGhQIpHwOyQAZayQ6f1ulfSdArYBAFD2EomEYrGYWltb1d/fr4qKCq1atUq
SmHkDwDnJ2cNtZktT9dvTzewrg25fl9Q3YhECADCC4vG4Wltb1djYqHA4rMbGRrW2tioej/sdGoAyla+H+yUl67eXSXpi0PYTk
v7Uy6AAAPBLZ2enFixYkLVtwYIF6uzszPEIAMgvXw33v6bqta8YVLv9kKRnnHPHRyxCYJSjVhQIlrq6Oh08eDBr28GDB1VXV+d
TRADKXSE13I+a2bLU3/6LpNfM7DHn3AZPIwPOA9SKAsETi8W0W0atWqzOeyo6NDq1atoqQEwDkrJOGe5Jx7y8w+Lelu59wXXzOxJr
wMDzgeDa0UPHDighQsXqrW1VdFolIQb8En6sxeNRtWZ2am6ujrF43E+kwDOWSEJd9jMLpX0MUkxj+MBGizLBFIlEFEIlEMif
CAPBu5KzhHuR/Sdor6d+dc/9kZr8i6WfehgWcH6gVBQBg9Bs24XbOfcOc+592vOubWp+886537P+9CA0S9dK9rR0aH+/n51dHRo0aJFi
sUkAABGi2FLSsxsjqTkqY65xrM7NckLXPO/YXn0QGjHLWiAACMfoWUlPyjpP8p6UFJcs4dMrN/liThBkZAJBIhwQYAYBQrZB3uic
HSbYBABhlCkm4z5jZ1ZKcJJnZYknveRoVAAAAMEoUknB/UtI3Jb3fzN6V9DVJ/9nLoAAAGEnRaFTBYFCBQEDBYFDRaHT4QYA/f1NbPQkktZ6Z6bAIB
AK6Sk5BFJsyX9m6Qn3BAYESxMicAnL/KuaSwkkKXdq5PJIASiYTi8XhmfuRYLMZMjA5bRmNqv8+bd682e/QAo2ZXYDcqOFGyTCDBBA86RPhdA13+kSYkpLc0sesdBtVV1frS1/6EseyPBgrAORHw
o2SYgYJIFgikYgOHTqkpUxZgazrV69miQIcJcWgeSA/Skry4PIYgHKXOR0VsS8Fm3fzV+3ScW+NWxbpbUlIRm0bxbSyFQMVSiaFK67b
dq5aWFsViMdosDYKnBvyjOKUc3vRw50Dl8y4r0Sx4x7nbTcwhTJ2aR9ULbQ+NjGWIH8yDOKU/bt6P55Z6WWd1l0oeb6CcRX8MPas2dP1
851dHQ455xrb2939fX1PkZVPtJthsRLZsWhvRtbmd885906b7du3zyUP/xhKKBRyp0ozU2
ZMsXNnj3bhUHN0Vkp3KNUQFQHvHGExJFqLSX+nldvwKDp/NnsKyz6V0tiq7fRyJ5aUq3qUxEbbUAh/ILSXZ0/Q8xtZQMD1v
ZMsXNnj3bhUIhN3v2bDdlyhTX1tbmd2iBRZ5RnHJpL0mPuyFyXEpKcuDyGACcn5jZ5d1J5hwYTmdnp44ePZVInH06FHyjBzKP
S8j4c6BAy6A0YA5pYvHFKfFi8fjuummm1RdXS0888XSxs8njsssuU1NTU9ZYgaamJvmwZrtSGpY6W+hl2ac2bzE2uHw3q12n8O2Vap
NNm/erPXr12vlypVV68cUXNPmTM9PcPmfx/z8tpOqdDvkmpA9+Vl2xmZAcM4TTPFKwAMWKp6EBaGNnUYdRI1vjJPPp3ntyZ1fFgjDvpM3XCTd4KAcB4y33f7vaqnA3GJ6XhDkMU1VQuFzjD2N1DxSvKTe33G7QWGUFMdbUXcgedrmCKvBRP9rWQ/cezQo8T+P5Aj0kN/nc6
OxzLlqOGmhzsP5pQGMBpwLIPXTp8+rZaWFl111VWZ3seWlhadPn3u3uyJKHmsF5O5mkD64YYTbbEBzq+fkn0ePNLIsbIrabHzRdVMSA3gZNVRbE40adHRe2ks
avly5dnleGsWLFCu3fv9ju0wIrFYYN5V+hM40r8zYqFCb+YAzbWYWlBrOiWbsf4FNkDIGsnMdb5W1EwOa5P5fF1cDqFlkUvmmFSpiNrYQb8cn8HvDAqF0aoZTdQSHI/NHk1O0nGvfNRAiaT/1
ra2OgaYHMzO8QAm/w/PjhcFiNjY1qbW0tmxpuerhzKPczkQAAgoEkqCIzIBQbuzMb+lbX5Elk3YBwDgoASpcqEicfOrJfSvJfxT5ocgX0bQsvEIbW6hk9YiVYtDdMWXqzcmQYSqqZRGyCi0PXdTr9ESyGkN9jGvcrbyrzEpFJNEaI/HBGEMD8Mde2ExW2PKq66W1uBCB0H9hT1D4d3zS9f44/UBkvHHCYpGjw1Rq4VXxXdHhLPi0B4N
ABDB3y6qLHsuo8d3Al8etOFeo/8zvaBE3BaMUH9w7iB0+Gh6SmS1Va1uOdi62n5nUwWTTh4dVzSqmvuzpyRWMMWrHZtd04jaeIdQT
nNOCf0PKU5Z3p51udfTA2eBl4dDqW2rXYcFeJtANP2Grj48x4dt0IUPWS1zbQGVTVFoB+U0MIFGIQTuWtoXC1TH3NX3odYuaAgpO2wHvhhL9Jl4ut9qr
EVHd1x2BD7/Y1wYTmKqpdd9dp6kGq8MFUWvqJmnjJNwIczl2Fi6kGNrzHGJUjUv7ozP6LuRrFnX6BXxkEqUGvIqMl5WqOTmbdHYNTT2VIbRDhHtAT98AjPoO2yDdxUAWeYF4IzHyENKtnWpqrqpa0xJt0tx3MmZiivS7oXcjjNBJGgTt0XvZpjHxwrAqQTqbBsEqnJvg1bmh0KKQKKQvvKqQRGQ8wBMnPEDw4jvVnX0yUHeH8CXV9f1WRxKsmTFQVgEf7CwHY4nCQ1QhCgK92Dp6nBv4FT5d7Bl5CkG0FQEY9evqjM9UVHGmCVVS20EJpfNhj4OgmuBXVKJcrGRvEQ9c
hcQGWXAgMzRB2Djh6H1dnd4i2PQx5M5cPNnRP+0T4FoH4e4eHu9AZ6W2oJdmT0A5PGvbTGEvAERFYhO3KAv2ukJoJZ9oUFNcDnWqwZEP6dB33SdECdpKR0fZ4iALa2R41tZGzgF6Ekyvd5T8N7wXrmMGRRV7+BHPW/PHLJ8RKjyH88ICcJ2eNVmE4A6l2AbxFwq8pSZXYqLPLcxYwmPAnTBm3/jjxKgkdAqTxpP8YwngeDpHM2TJmA7WwlycBC4s0VA5wB8Zr6eu1Ru21B2MKkNtQrsFvhgmDjXrJBoVbY+JoQL9xEbmqvqZdoKvFXTP6pBAXn3SbaLZGI2F0R+U0cp7Bx4Ox7Ny1u5RxgqJqTQBiB2B1q+y2B31JsD3bzVDT6iEnK3hDM25mqLAUYDIpVA8zIXh7tEjpAIQYCo8pAqxbBmC+pGMiLGBb7pvq3bj0xdKBhNy9z2z6k1B6q1lBjfTdK4U8bR8XTwXoypJCVZ1rnjFqPZlSXiNXFAPS1xGO0ZD9nbMlOz2uZhjLqXgxbO1jK7uYrkAAnNuFkBXVpQRlGAq9m4ZFaXtXmJnRM8WIVvZfHeDfDz8TmrZ4mLLjrBmFvWNDbZGVmNNuaUkjJOvG9jZZMGxwDZcHRtqvCv9gWmrnRCVqbPGY7vT9aG3XOIfOM/Fm7l1Lp5cMkPeVfg2e1gL1VF2j7gHnh2mVEsMRjXyoWdHRn8fD0K4aQrPKUTOFL7w2+LL4AQbQqSHqqVmpGRI6xkOAQBrDjbJyo54n47d7hLBVBU1mMuLTXaPMTE0ENK8OXeVm2Np1QAHSbJ2BtsMnLGm1yLqvKb71RjhBfQ3BO8YvZmlTVYtqi1wSJnsbLGY76iRfuJYd6H2jzfVQbMGQxfFGNkgjqQIQUjAdrbHmJdnOmGXzTO8OAAnwEBaEVTsA1wV6uTWVyQYLH1wnXTyfV3fSJUM57ADYxQKl3MgzRw4aJXzvsmQO8aNwuYZSL3EQFrJSL3GLwTb58TQ2Bk8Xwd0QkBZWjmQrF4q5GXQ2WsmNDQ9O+pqB5QgCYpg8LTNajvgK3ijTp6LPQRtSDqPJO4QtpVnRLJQYBpoFDdAJUr0I4f5X3LaXPZDSe7KmFkp2sjIUh4RRHD8Ke8FGAkjzc8OuZKP93VyVgO1e5g5i8MAOZ5MiYxqwFk7BXBwMSN6UeEAxMK0VPy5cA8q0G2WYfVjHBt7mHbeRSa5WzLrbS8rsi+WtCmQbfiqDUItNLIzmEWYzYGk2qGj65D7Ew1yGOrYqm9AmOxegkXhFIkqGYBUNbR6JqPKFWPwn5DtqH8i3bwpk5WSMbYtaEVnsPG5WrAwYFnWBgZRFaXPvjHp4+rqTTNQWa5q8Mgs6rWbhvoo2bwKcbiyg62tdh5qmxGeIq1HpEPK2rhsnWeLPuM+OxEnL5+8O+Vy2S0SxyBSg1qU9XOu2Yu5Qqx4trvO6wfXRRdQhxWhnRkdtYoRsEdUPTcnj4YqkZL0yuE1nM2Cl3y3QwPQ1MbS1cAYVLsEnzxvzD6fW/WkpEZW6u1gVVRWhp7d0MXM0NcLw1E/3HC5zHTD4cBHSlzAR4U4VdUPNuKTvTrZGHUhsVVdC1tkFEXVI2GjcMixG9FnT+eCAAtNUY7kn4pc4DbWOUI5cPl7iZ0dGWWJ8/ACM6Z0Mz/nnG3fAYRnhb0H2uYI3m8dALdwjxkl/9xjwkMtWz5ZJn4ywcpOM/QZ0vbfwy9O7HvG9OGHTPj8vcM1AaMRCjL/44Vtf0OYITdbbsSdHHm/e8PWAY89rCZy8QhMEzBmE1BW0HGCJ1a9e0Pi4mqDWSw5bvS2uXJY60Dt6m6g12TjPsZXpkxm9BnGBV0S+w6Qmdi/+fJ92Hbf2d0UHsrrnF1ey0BNI3Q9J1qEPQHJYPZ8Lj5wWMLV+h5KbXgeFtxMijN1Ku3Xmy3bcLWwAT98vHBZsHWmwvN0u+fNFvEfWPL0mNoCLu5mRqIZNQYDWRuCR3xjkRS49YxyDc0RD1Sz0aU/Ixa+fb43d/3rlaXfgKvzDnIY9Fy8z+UjSg9GEjWxJc

XjpS4qDcUkxP64KFOfIkSNqa2vL6uFua2vTkSNH/A4tsKZPn66+vj5J76w02dfXp+nTp/sZFkaZRCKh+++/X5deeqlCoZAuvfR
S3X///Vx9AlJIuHMgeSwelxSLx4ldccaOHav58+dnzVIyf/58yiOGUVVVpV27dmnfvn3atWuXqqqq/A4p8Cj1Ks7GjRsVDoe1a
9cu7d27V7t27VI4HNbGjRv9Di3Q2M/OI0N1e/t1C1JJCZf6zw2rZhWH0qXiSHLhcNht3brV7dmzx23dutWFw2FWTcwjFAq5e++
9N+tzee+991LqQfH/+JJcvv27XPOvXMs27dvH5/NPNra2tzEiRPdmDFjnCQ3ZswN3HiRPazApRjSYnvSfbgW5ASbudIHt+NI
H8YgoQv9uJUVla6FStWZH0uV6xY4SorK/0OLbA4qSsebVY8Eu7i1dTUuIqKiqwOhIqKCldTU+N3aIEX5BwjV8LNtIB5MN8vvMb
S7sU5ffq0fvSjH2nXrl2ZKe5Wrlyp06dP+x1aYA2e4vTFF1/UzJkeJ0GJR6Fa+2tlaf+MQn1NbWllkF9hOf+AQrmuZx7Ngxb
d68WRs2bNCBAwe0YcMG9ff3U4YzSlHDDaBszJ07VytWrMiq4V4V6xtWrMiq4V6xYoXmzp3rd2hlwaUGTSI/xvAUb/Pmzerv79fKlSu1ePFirVy
5Uv39/dq8ebPfoQVVaQ0ND3vvIVtY170N1e/t1o6Rk9Ajy5Z4gaWtrc1Om57pkyZwr6WAyU4xaM8onjsZ+eG7
8zihMNhV1NTk7Wf1dTUUuHA47HdogVQuNe+ihrs4HHDfHRLuwtTW1rpJkyZlzE8adIkVV1tb63dogcWXEnGYH//vm0/hVm
3bp0LhUJu6tSpzszc1KlHkgTXSgUYv7yHGpqapyZuWnCxxNwNe8k3EWiV+jd4YBbGEu2rRpWSd206ZNY6BRAdjHC
sOx7N1hPysebVY4FgsqXLqNBvdwp9suSHIl3NRw58CgmXMTjUZVVVVVlxsZGVVVVVKRqN+h1S4G3YsCFr4ZsNGzb4HRJGEebHB4J
r/vz5uuKKKxQrhuoTnKUUEPFFS+GrY0YNk5fDCFJnXhMkDNu6K9Q4qPuJGp3dfWpCCcoGm/kYB6R17D3Ja7TdAD5tZcdjZEo6EEA8EhbSNUT7
nAmNxtlkASD+GHmrA++9aE9wfBqBQTzKr+PYqDxa2vX0XRXHXpgnrqbP5gMzqjw3Pv+VB0izUwn2GGmmlFsObfUj/ky8rZTeWJcR6BwlA6Q+b5oL+
65+///u+roqLC79ACi/EoGAnpAc3pPCM9oDkej/sdWiDNnz9f99xzj7q9Xf369QKKTx48eXz0DToepMvLhJelDSt4fn+Jkg13
NRWnRumODp31D0OT5Lbt2+fc+6d9tq3b1/gaviCRKmax8E13ObRwytsrLSrVixIuYUjUvU44abnP
O+6V+zWy2pL+X1OCce+uM390k6SZJmjp16tX33Xef5/EUYtGcjqK+vT0uWLNH+/fCd4G+NhfwwWRkGnpzvaylFSlMSSpoFjOCOZYVjTErhyiUvU44abnP
/vYxz6m/v5+ff7zn9/fll1+u5557/xF3/Y7vEBqbGzUDTfcoEPv8AKpsbF
RU6dOVVNTU2Y/a25u1j46hHNu3lm/GCoLL+VN0gRJT0j6yHB/Sw93/dzRzKzS8trY2N2XKF
Dd79mxnZm727NluypQp7Gd51NbWunHjxUnHHjxmUtfFjFu3dhmwsnDzNzatWudc+98LteuxXevMzMeoygfHsuLRZsOrr693svgVgsK8dI3d
S+bHwjZmNkfSApG85577n5WuVGotFFC9d997+5cvf1d1d1dXVmjJlRt1+++hBdqxY8+eTt3a/jg
2N0qXisMiLsWT5B555BHn3Dv72zC8Pxvzgqk0HzGumSEufcQeecOed+zTn366nbI
169Hvw3duxYzZ8/X9FOVEuWLFE0GtX8+fM1duxYzXh09ejTrkuLRo0dZ+CCHeDyu1tZWNTdHwOq7GxUa2trUyjNY2jt
Dhw/nvY9shw4dULdXl2pqaiRJNTU16urq0q0qFDh3yODKMJC9+cXzyt4cb5paenR/fff79cXXb
Msuu0w333yzurq65JxTV1eXbr75a8GU5hGtvm2aKk87ZFPLDPdS3F2stY5dSUfO+QWv+2qrRb07dyoXGy2
7d/odGkYRFr4pTm1trT+xfs+Q2DIQvT+s1NqvWr9DKwhmKn3ZGBq+ym+d+ZbzanrZe4+bbYedsrKHKhX2...
Rf8Di2wTp06pbfeekt/9md/lllg43Of+5xCIc6FhbcLZmWE1e68804fowq2np4e7d27NzPXW3t7u/
NW1dXl/bu3UvnAoqFovpxRdf1D333KOuri7dc889euqVVzzrBfSXX6i/PJYeGbUE4CdjNvdvyZdx4Yel+7UMKn8ZjrnZfGbqFcw0Vbzl5Vc9uBqaDpzv6cTjT3N0+JUx4UHhWIZ3YdSEGdcacQhbNNfcVW7Hzpe2BmrPofIsWWVjf5LNvTIpoHBPOIfk2
4MZitfT06Of/vSnkiSK9nqs3ZXu9PMFRYnvyJCHKBPC2wQYzdYWVgiZTzZ2OxPDn2E7qMRHIuE9nUGhmFqozpAKxxc7DX/ycB1r4YVsTrp7gQBZtpoWSlmW/M5ZV9XJTpu5W0OJxWNxhCPG3EGRpgPPqPh4Y3xbasp4ewu
jt56eHn3729/OHP8/9KEP+P+R0SRpDhw7p5MXfvSpnMl/dCQ1lf1UkB94ZCfiMH8J/4PJ3PRzLNPXO1Xyod7UZXVhRbpFpuZVkm
fr6erd8+fKsVROXOXL1/OYIY8zMwtWrQaMwGSBkhJpE3Pq/OBzWSAGTRY
mvU+lV35N/6yoqPA7tEAql3UY5OdKk4WaN2+ee+j9dZzuOeurwb3tnFYe4zpQIm9Xx9zseZgZo4ceJZ18LDM
8YM9ff361vf+lamJ23FihWWqKjQzJkzVffffi3lMFb31a9Xzrpqr6S+iP8v/vHPYxgaAyQ7Ek4ZCzR7o5ZDjRgd/b
zpjzuqquu0o9//GO4pGWKDpyQOhGMkFYJvP3a9/P1AGOODXTPgAA1w2dAPy+u/hEbOg1SLGvsaVZl8W7h
tTDzUpjxQuFQs7Mss8hdlAkHLAKhFqKzfqQjjAOPlBNa3kM2nqWxbn1Qfl0XGxNDs1zPlRG1ee8ZK6UkIY6JD+ybJ5m4E
ykOQ2bdqU1V6jOH7RW0AjhEKyh6hDbj5KbgDCJYrSz5FTnv27MkanvPJnpayOOOL03wmavX0+m2lYA2o3mdDgYq17fz
aswTNl5bg4cOKD3ve99t99hUnCUjj6Jq0A5FNT/Ag4vyOI6YK8KLz/1d+BCbUEB4Sv/oKmr3M8sBkJZ2cQ/TOjm2bGz
1dbWOHTsmKTkgsfTC7qjKqzDdHq5TSVGRTYFWj62kKVVI4UXpaI3lMKB6K7vUIDvFBz5HE5e3F0lrW9Mur7I2Z+jW1pAGL/O3LFnPTZeDQZ/OjWjBBGAv
5iyM7dQKKSBgDFagHt3LlT27T+ZkQQSMzy6WCoGQW8fyrwPZSHBYQPBpwjvfEaSK7Wp
dSpvlIclFIpGssRWRSIQa7jwkDVlfS5vlFgqF3L333uvh0uk20wgQETYpPxSWtYcVFFTVVV6Ut2sSFj
NiQdeniNttuU3d3t9/hBdKMGTN1Mgx9fb2ZpZ2Z2HzNmjGGqpPYmfbXsZ2H9zjRO2jrxTGEMR5L7jSdxcpB
zZunuu+/OtNeNNVeNMF154bKXFxCe96bT3vUaIX1StPHbi8vzJbK0GqHmqOzNVTRa8WgtRHH0sU1hwZt9X3EgSV5JnQVjwb3P
4fDevvtt2mzHMVMVdbKVdBKV3Mt7c4cRzn09PS0VSNJQPLbxirnLfjGQFmmA2FZt1xZZyd+zHtZc7P...
aYA0eBLJkyRJFo1Ft2bJFfX19focWSGam6667Lms1u+uuu47VAPNIDwAfjAHg+dXW1mamuFu8eLFWrlyp7u5u1dbW+h1aYNXU1
Ki7u1s1NTVD3sfQzjx2cSzLLR6P64Ybbsj6vrzhhhvKZmIGEu4c+JI6uS8/+9Ke1YcMGVVVVacOGDfr0pz/td0iBVllZqdbW1qw
Bba2trexnObjUXO/btm1c3c70XIF33OLjNmpqatHr1ar9DC6zNmzdr7NixsXXt4HYTPm0k+xpRlNJJNe9TJwLqpqeYxvyw
o8f73dogfXSSy9p+fLlwrp0qa699lotXbpUy5cvkReR3aIF05MgR3XXXXXerq6t05MgRNBkGqTqbv7mfmZsFz3V1JaNU7oFYQ5uUGa
DHQqFsmprQ6EQNdx5pNtpcA1fWGmF6YaL/IKaWUyqKMjNUbCHNMzTnT7YZ2Nj9NwJkL8Pd9+h2/bCi28NCbVW5ZpqnnJ2HqhgxKmTPq
NraWnfppZdmfWdeueWWWs9DZcfYoHNA0qK0vKrSq6rAzsL9b+1mqLlDpp5YFdgLrS9xpT2SJMKQ8Nr5PAfYfP+BmS1Z0QjiJx+lpf+0Rxc5cYHw0VFNtaalQDSf/gBqkr/XT

JEl177bVasmSJ3nzzTaa4y6Ozs1OVlZXq6emRcy4z1R3zSg+tsbFRTzzxRGZ6toqKCj3xxBNZqyjibPPnz9cVV1yhUCikK664g
uNYASKRiA4fPqz9+/fr8OHDgaoRDaK6ujrV1tZmtVltbS1Tdg7DnXF17sz7eEdfX99ZV38rKyvLpgSThDuHeDyum2++WXPmzFE
oFNKcOXN08803l02tkB/e//73q6enRxMmTJCZacKECerp6cma8g7Z+vr6htzPyuUAMtLa2tokvfOllP6Z3o6zJRIJrV+/Pusy7
Pr165VIJPwODaNILBbTqlWr1NHRob6+PnV0dGjVqlWKxWJ+hxZYL730kj784Q9nlZR8+MMfpqQkj0996lNZdyf+tSn/A6pYMx
SkkMoFNLFF1+s6upqvfjii5o5c6a6urr0+uuva2BgwO/wAqmhoUHvec97zlqU5Gc/+5kOHz7sd3iBZGaaPHmyHnjggcyo69/7v
d/T8ePH6ekYAu1VvBkzZujEiROaPHly5lh2/PhxTZw4kZkQ8liyZIkeffTR5HReZrr22mu1d+9ev8MKtGg0qp07d2atmshc77k
N/my+8MILmjVrFp/NPGbMmKH+/n5961vfyhzV6xYoYqKikC1F7OUFKmiokL9/f3atWuX9u9u7dq127dmX+gzG0zs5OfeQjH8m6d
P2Rj3yE8og8QqGQjh8/rmuvvTZzO378uEIhPpq5bNy4MWuWko0bN/odUqANNiVo8Ek3swfltmTJEu3bt09r1qzRD37wA61Zs0b
79u3TkiVL/A4tsBKJhO065555Mh9TAwIDuuecerqTkcerUKZ08eVLRaFSPPPKIotGoTp48qVOnTvkdWiBt3rxZJ0+ezCpbPXnyZ
NkMZuZbPYe+vj6NGTMma9uYMWO41J/HZZddpptvvvjmzslhXV5duvvvlmXXbZZT5HFlzpL6f0Cnbpn1xFye2LX/yixo4dq8bGRo0
dO1Zf/OIX/Q4p8NLHrfSUYxzH8nv00Ue1du1affWrX9WECRP01a9+VVvxrtWjjjz7qd2iBtW7dOp08eVI1NTUyM9XU1OjkyZNat
26d36EF1rFjx7Rx40bt2rVLv/u7Ozp48aNmbFjOFtVVZWmT58uM0uM0wtjX15e5f3Fc3c777azP5dtvv+13SIHmnNNVV12lhoYGL
6pRMnTigajerhhx9WNBrViRMnOFsfRnqRjcE/MbT0ANN0wtjX15e5fI3c3n777azP5dtvv+13SIHmnNNVV12lhoYGLVq0SA0ND
brqqqsoW8rj2LFjuvDCC5VIJLRv3z4lEgldeOGFJI/DaGxszBpoygDw3OLxuO6//34999xzam9v13PPPaf777+/bMbWUcOdA3W
PxTMzbdq0ST/4wQ/U2dmpuro6XX/99btv5osqBmuTihMPhzFWAwSoqKui1zcHMVF1drSlTpmSOZa+99lpmECOZa+99lpmECXOZmaaOHGiH
nzwwczn8kMf+pBOnDhBm+VgZzvryl7+sTZs2ZZY0vf3223+sZjmUS01yUFRUVOjrX/+6mpubKio0zrX/+6mpubKio0ozrX/+6mpubKio0zrX/+6mpubKio0
LtHz5cr311lt6/vnnNTAwoOeff15vvfWWli9f7f7ndogXbkyJGsRVzKZkJ6H6WvoAz+iaH19/cPuTJbkA62QZSemjOd+DBVZ37V1
dU6ceKEvvOd76i7u1vf+c53dOLECVVXV/sdWqBt3rw5a5a5aScqmt9cvmzZvV19enlStXasmSJVq5cqX6+vpotxzKvWyVHu4cLrr
oIh0/flyXXHKJXnnlFU2dOlWvvvqqJk+erDfeeMPv8a9tq1a3XdddfpkUce0fbt21VdXa2TJ0/6HV4ghcNhDQwMZ
Pav9P4WCoXosR1COtk+cx+TmL82lxkzZuiVV15Rb29vZtuYMMWM0dvepUetFyqKio0Pvf/37t378/M0vJokWL1N7ezsldDoO/M9P
HMr4zh8dsOIW76KKLdOzYMYYMYDYfX19WV+1tTUBGofo4e7SMeOHVNzc7NefvJ09P9OSourpae/bs0bJly
7Rnzx5VV1erp6fH79GiRXLO6eWMyPm1Vz4M577TW/Qwq0vr4+tbS0qLq6tMSQvLMztdm9sorqqys1ZGRlqJNx5vPbaa1mDZD7rE
M+ePdqyZYYVa29sVjUb9Di2Qjh07Jj7JjPTRRVeLRdRt37X89qRf7ZGhZm17TW/Qwq0vr4+tbS0qLq6tMSQvLMztdm9sorqqys1ZGRk
OHNG4ceMyM+KMGTNG48aNoxRnGOnejCD1agrRVe3u7qqurNXPmTJmZs6cqerqarW3t/sdWmDFYjFdd911MjbkZH6Tddde
MswJk6cqNmzZ8vMNHv2bE2cONHvkAJt586dam5u1oYNG1RrVVaUNGzaoubVqaxzao2fu9Du0wFq9enVWR+jq1av9DqlgJNw5hEIhbdm
yJbPQzeuuvv64tW7YYPzeuuvv64tW7YYPzeuuvv64tW7YYPzeuuvv64tW7YYP1
5/J0hH+zGc+w4lwHl//+tfV3d2tyZMn5s5Zq5ff5sc3sACLx+O66sqafsubCuhtpCXf3NjcycsbcmxnJg+tKJ4
K57F79+6scQK7d+/2O+j23ZHa+2TmScjnFE4Tv7Z+g8nf9KvifrlZbYFpwkFN4pmaqHV1kn9WFMmCmnrcoUmuZmAbe0mc5XMpUYcz
VWVuru7Mz+R39/+7d+eNRMOchs8D3PfOYz2rFjh9+hBdaRI0F2hFm8c0uVtUjcypUr9cIILL/gdWmCFw2FFZD5Rt3FHmmI9FUnIQYDQ
aZVBzDuFwWF1dXZn9atasWerq6sq7ZnH1dd2WwsHVgNHVmCkTYiJBYmdsPbkxZptAnPGvjlBCM3nXUV/lRvKR9ofRDDdFaVjl9w
MaMGa1OamhoGtA0hFApp/PjxmVHqHuzGRCNY0nbJJhsVPz2x42C8YPz2Q1u1ws0j0xLSBGVX4kO1uO4QfPLKDDRRfJnTTQ2+
eHn/88zc6On7nBQPLT3RwJmYaGBo0Wh0yDEB69atU0tLiw8RDY1Bk+cgnfyc+W8M7amnnjuzqrzv2V11D8g8VZvYE
nVKEyZMUCgU0oQJE6Tq1CkGtOXFXnBXV5cSNkgaDuZLO8ikSwzSRfw0ZJngwNV6V67Snzx/+E4nXqMSw+9GGrEwGa71+ScKYC9O6
oMxt0b2Mt3KJbDzp+N1gj/3E/I9FoOUAEN1LpzNrsf8+hjMf0HR+OwAz1+qAxwEgPzZ7cRDSFS1GWzmDQNXc0+fMgO9ZAzedTmFUS
Q0MOjkyZNlcznRL+kkcfLkyZmFfgzvx9muvfZabd26VbT1udmDmMfuawHG6aM7mhudT42GdqG07bx59f1L44beNZ9b24Bn
1t7eX1VLlI+1v/uZvJJ19LEtvDzo+EcNI9wLRG1QM9PnP/957dzmR5///VfYkU////0s/Ch51FCBD2EDDNq7EvBDAp2fc/K+BMPjBpK/r
R/84Af69Kc/zeC/YTjnNHHiAPat2+fHnjgAU2coOJGrAnns3btXixcv7o4dT9ddrx44dWrx44ddWr4Mfmjrhc1fM2MUCqm5uVl79ux
Rc3MzSXcBzkywbSbhzc86puro661hWXV1dPscy51xgbldffbULKkRlOkpswYWz2STYSiS3MyZM11lZaWk7iWTSCorSkUCjHjRg7p5ZDHjBm
bCbMGGCmz17jtMzN3v2bDdhwQXDo9f9Di2QJLnp06UoBQNNdOns4S7OceejXAkiiWN+y5cv1
5w5cxQKhTRnzhwtXx77c75ACK/3FPXiWksHbcbbjx49r7NixWb49r7NixWbNHjB07tP7iLMdPXo066TXOadTp06xvQUBD4Et+VptDm
Z3MHMNGfOHAbN57Bz506NGcuaz2zduHHjymzlZvM64R6qxiZ9W7duXeZ3ZSrJTsWTMzrVu3Lu/jzmfhcPisk450WQ5ya2tr009+8
hMNDAzoJz/5i2a2BgQMePH2c2nGE453T69Omz8bFR+a5+UkGkHmcAHEPatoToI94qtqqqVFVJed
g9fTO6JlnntEll1iwiSbrkkkv0zDPPMGG+h0gkotkO7vl6tra1lU+ZFwDnKXTrOpBkw7U5OpBk
54twsySAwRSP5lFIrd0G11wwQX65S9/wQX65S9QsuuEDHjx/qS59/qSuuEDHjx/nyz2P8cPCcG7fMoP5ApXqJed
c5t8sepNfRUWfxo0bp1AopHHHxo0bpVAoNSJBJRLJBLjLEhVTqjhLsDsTQ/r/dt/1+8wAo/VOYuXvgIw+KQkfZ8201v6qtOMGTMyS
/v+/Oc/ZwBgHunP5YJZY3J1+HsnMT4nPZS4cy4qXbrPgTb5ytv79
f3d3dMjN1d3czWLJA6SSb3m14afBicRheeiEvSSzklZKvbDd9m9X0w4KnnA4KEm6UXHrifibwLwy1ooUzM9XX12fVcNfX19NmB
Vi7dq1+8IMfaO3atX6HUjYGD2dYDPjgs4fT0FkpnbDK3sqYpOBq8+HvFdVJ0vGqi0hBSpX8+ZPPhkuGaCpmOfT8bhUa5ttYLYEk
27Vpdd911euSRR7R9+3YtYXrzY79ACb/v27dq+fbvfYZSM0tvYWNWnHcjN27NjMQdbMNsjS4bdrpwg+exwH
LNmlTjfDNejeGbyuG/fPupc6iurs65uZYWS+h9J65zufIpkKTQdqvrTqcUVJ9zLPYRXy8/tOdBkLlOTlbQWjOkGcDTTQ
c+ZwIScksBRn19fFrLv/zLzLZMGLJvVvCQM4m8ZdGxJo8vqGnqYJoGd8OD5TO9WDSYmoZt57XGp8NMr0BnkBQYGSUmO3pSSNqMjEkg
8M+7nz/zixn1HCjKPkGJlx55ZVDPubKK68M/GAGv6RXydM3kL2l2hqbq6mmmhUDJ9fX2aOHGipk+qTpHiRAbnAiEwCZvFUmAEeE
nAiMg33dmfX29YrGY6uvrJQtl3ec7c/Qh4UbJPPnkj3c7c/Vhuzeq2VVVFpJJnyIKhnwrkzrndOLExiaxVAE+cOJGZx5zVTPFumZk++
tGP6rnnnlN7e7ue+45ffSJH2VfAnwWi8XU1dXpYYWMPZVDttTcvM7Wzt1pTcXcSLFBQfjU9HPPxaybUcZWIOzDFtSOa9QN2Dv5hrwtLW16fL
LL1d7e7tmfna32tvbdfnll6utY0eDpTMXXfDpW3btqm7u1bvbtm3TXxfd5XdIZWHy5MkyYMzy5M1YzmvYzn8ScikYji8bii0ahe3PoRRaNRx
ePxslk5EcWhhhvwUfrAGo1G9eKRTkX31HHAxTnJ12Pd39+vW265pajHcLHLAHB4L71y4uxND+swY1JGNXq4AZ9FIhEdPnxYsYzY
+pMOHD5Ns45yU8ioKyTYAlBY93AAwinEVBQD8R8R8INAKMcl63PTSgU0sDAQOYnAJwrSkoAADiDmWWS7IGBAWZ1Z1AfCukHADAHCGM
+vYqWsvTPrEhBMUIBsJNwAAKIn0iQknKEA2argBAMCwzrXXmmXKAXq4AQBAAfJNI1lZWak5c+ZklZTMmTNHlZWVTD0JiIQbAIA
hLVu2TN///ve1bNkyv0MJvNWrV+vZZ5/Vli1bNONPv6stW7bo2Wef1erVq/0ODQgESkoAABjCD3/4Qz300EGheibGk5LS4sk6
bbbblNPT49uq6zUmjVrMtuB892oTbjf+z/36Zdv95bs+WZe/WlWrcWkJp3pYWzd70sJ5nvnc
gy6hNuH/5dm/JPvAHDhzQwoULS/JcpUrcAQDnrtQDACUGAQL5BLUjVBqZztBRm3ADAJBLvuQ4Go1x44dam5u1oYNG
U1NlEgA70JQO0KlkekMJeEGMGLO9x4EIDESDRsiBXBgwMuRgInwgBQ/ki4ASDAOEGgPLH5KIAAACh+4Ad2mbrhkjKeKqSh9n6CtsbaGTJSANw9HfP/Otm4AAHjLlvSMi8FxnTI0g+nKGW3vjxsyTgdY0lpNQTc/RZp3TjE

GHQJAAAAOAhTxNuM/sdM3vazJ4xs01evhYAAAAQRJ4l3GZWIelvJC2VNFdSxMzmevV6AAAAQBB5WcP9XyU945x7VpLM7D5JH5J
0xMPXzJhYt0lX3lPCTvV7SvM0E+skiWWCcX4K6udS4rMJoHAlP5ZJoz7PON+P/+ac8+aJzX5f0u845z6duv9Hkn7TObfujL+7S
dJNkjR16tSr77vvvpK8/qf+rmvYv3mh+YMlea3BZjX9MO/vq8dIf7OouuSvWwrRF6J+h5BTy6wWv0M4S5DbSwpmmxXyuZRK/9k
c7nMpBfezGeT9LIj7mESbnQvarDgcy4p3vrRZY2PjE865eWdu9zLh/qikJWck3P/VOZfzUz1v3jz3+OOPexLPu1HKUernC9qse
LRZcWiv4tFmxaPNikebFY82K06Q28vMhky4vRw0eVTSjEH3ayW95OHrAQAAAIHjZcL9T5LeY2aXm9lYSX8g6SEPXw8AAAAIHM8
GTTrn+sxsnaS9kiok7XLOPeXV6wEAAABB5OlKk865RyQ94uVrAAAAAEHGSpMAAACAh0i4AQAAAA+RcAMAAAAeIuEGAAAAPETCD
QAAAHiIhBsAAADwEAk3AAAA4CESbgAAAMBDJNwAAACAh0i4AQAAAA+RcAMAAAAeIuEGAAAAPETCDQAAAHiIhBsAAADwkDnn/I4
hw8xek/SC33EM4WJJr/sdRJmhzYpHmxWPNiveYpHmxWH9ioebVY82qx4tFnxaLPiBLm9Zjnnppy5MVAJd1CZ2ePOuXl+x1FOaLPi
5sVjzYrHm1WPNqsOOXYXpSUAAAAAB4i4QYAAAA8RMJdmLv8DqAM0WbFo82KR5sVjzYrHm1WPNqseLRZccquvajhBgAAADxEdzc
AAADgofMy4TazGzbWbWYWadUmaUma8xs0fN7Gepn5NT2y9K/f1JM7vzjO62sz+zcyeMbUnfN58NpSx5r/vZ/8spB/vZ/7vzZ83spB/vZ
aSUqs3MbLyZPWxmP0k9z+1+vScvlXgf+zsz+9fU8+wwo/3pPXStlmg57zITM7PJLvYySVeD87YGZPm9m/pG6X+PGevFbiNht
rZneZ2U9Tx7Tf8+M9ea2Ex/+Jg/avfzGz183sr316W54p8T4Ws/rWRe9mTqu+BiP97Tmc7LhFtSn6RbnHN1kn5L0h+b2VxJmyTtd
869R9L+1H1Z6b/O8RzbZd0Z5I+O8RzbZd0k6T3pG6/43Hsfillm1A0n/1PmTflbLNtjjnflXSVZyMuMbOlUnZ2JI
+6nXwPillm8nMPiJpVJ8Iq8RtJmmFc+7XU7dXPY7dL6Vss5ikV51zcyTv4T9/SpxUeHqq6FjYj/+nUl1yr53gi9h5FUkvYys
7CkOyQ1Oud+TdKTktaNzFvI77zyzTNlfSZ7wXW7oxTxYI2xywLC0P/Tj17cx0OSOiVNl/QdhxWsFn+uI/wlgGV88qp7zE6QSZG+FR1Zl4q/Gf2UJ7I
tStVmqd/9g3PuFyMRt59K1WbOuoVPOuY7Uv09L+rGk2pF4DyVeqoa+vBGzd9OUx1hiWNlTQqB6uUss3Mbr7c8QjIKkDZL+wvvI/VPKNjtflLjNV
kr6curvBpxzQV285F3xYj8zs/dk2/G4+/S1HQimPo530XB6ZKODrp/NLVtVHuXbZXZE6KGRm6/0/S1HQimPo53OXB6ZKODrp
/NLVtVHuXbXZeKlWbmdmFkq5X8kx/1CpFe5nZXkmvSjhbveRBocJWiz/y1pq6RTXsUYNCX6XN6dutT/Z6kv+FHt3bRZ6vglS
f/bzH5sZt8xs6kehhsIJzOjEi6343y2S7eTXs553olrZX0b0om2nMltXz0bZb6HO64Q71aPzgKQ/GdQjVtRTDLFttH8Q3m2bnXd
K1WapS2UJSV9xzj1bqviPltTt5ZLulSSZWmZ3aZmf26pCucc98vdWxBVaL9bIVJJWizsJJX5
37knPsNSf9X0pYShhg3J7F0/AMlvwNFbkFjuyFzjaPofovEu24lnMuQ1XQ9WQyHw1SqpMJF0uMlw93lFlX9q
vVUAuXXihRG12Xilxm9016WfOub8ueaBUep9zDnXLekhJS3P8+69U+U+5lz7j7j9SP09IatMoH
ptSojZ7Q8krK0kTu+9I+g0Pwg2EUh7PzOy9ksLOuSc8CTYAStRevy5y5Jzrl/T10Fns26FcPSfp
k6t+flPRgvudJXd44YWa/lXrOTwz3mHJVqjY7n5SyrzrL/T10J+Lak+d5EXJzzMuFOXfZrldTpnNs26FcPSfp
Qsk/dQ5t7D0EfuvhPtZOD37QSpR+KCkUTm7Swn3M6fkoPmFqU2LJB0pabAB4cF3ZkSjuHe7hO31H5LmmtmU1P7z9
7KfmF4pS81PAvqdt1ki5Ssjb2Z6mfNYMe87ykY0qO4D8qaW5q+zwlD7L/LulOpd/Lul0pRYTGm23ErfZ5tT9gdTPL/r9/oLcZkpeOXFKH
jTSz/Npv99fgNtrqqR/Sj3PU5JalOwZ8v09BrXNznjO2ZIO+/3egI/3egt5mkqolPTFoP7tDUoXf7y/IbZbaPkvS36eea/v/v6C
3Wep3z0r6Vb/fGnQwVz9VsAbQ5izpoBIAAADBEAAAB4i4QYAAAA8RMIAAAAAPMIAAAEcAAADw7pf6DjFk3ABBQ5izpoDQOXAAAAV5Y20Ws
EMk3ABQ5izpoJktHbTtY2b2d37GBQBIYlpAABgFzKxByZX7rpJUoeQ8tr/jnPv3c3ciuCudcf2kjBIDzFwk3AIwSZrZZUpepSi7J
0KbnIyJWSwkouMPWgmc2W9I3U30jSOufcjSPU3DdUWVa8pSBpxz3Wb2HkkJ9sKQG59yzsfsQPAKNV28AAACl4ZzrMrP/P7l1zVw2o
XaSBpxz3Wb2HkkJ59y8VML9sKQG59yzsfsQPAKNV2O8AAACl4ZzrMrP/P7l1Vzq+GOSrjezz6SXVppqSXN1pZr8uqV/SnEFP8Y8
k2wBQeiTcADC6RU6DKRuJun3nPn/6LmdlfmyoPvqxElhBB4IxYpwqPWbeKeMLlrOdDx2OcgJP2RkgMsA
QAeIuEGGgNHpf0sai/JMzucui9JM/2ucoCagiY/DEA1yBRIFTNB6FwIbM4gXsCZSoPDxoePvcoXl0w8vqK1hmscs4Y9Bd1lS3
NAAAAeIiEGwAAAPAQCTcAAADgIRJuAAAAwEMk3AAAAICHSLgBAAAADwEwEP/P5hXRGNKoo0BAAAAAElFTkSuQmCC",
"text/plain": [
"<Figure size 864x576 with 1 Axes>"
]
},
"metadata": {
"needs_background": "light"
},
"output_type": "display_data"
},
{
"data": {
"image/png":
"iVBORw0KGgoAAAANSUhEUgAAAuYAAAHtCAYAAAABVtrsNAAAAOXRFWHRTb2Z0d2FyZQBNYXRwbG90bGliIHZlcnNpb24zLjMuM
SwgaHR0cHM6Ly9tYXRwbG90bGliLm9yZy/d3fzzAAAACXBIWXMAAAsTAAALEwEAmpwYAAB58ElEQVR4nO3df3xU5Zk3/s81mWQ
CCQIBDD8CJM+qbX646kq7XeWpRCo0am3aWulA11pSXPxupjyjLNRGm+1R7ZJ3bZsJWKSZGnZsTaZ9GWssBDBruU7naxapuSt
rLFHwkqKigkkIQk1/eP+UEGMpM5ycycc5LP+/WaV5gfDFduzjlzzX1f932LqoKIiIiIiMzlMDsAIiIiIiJiYk5ERERFREREZAlMzIm
IiIiILICJORERERGRBTAxJyIiIkyAChMfERERERQWwMSciMgEIjJPRDpFMPsWNJFRA6IyFfMjoOIyKqYmBMRXURcXBWRc6HEO
Xybncx/Q1VfV9VcVe1P5vuGicgCEfmJiJwSdkSkdF5IiI+ERkair+vXQRkQki8oqI3H3R498QkZ+LCD/XiMi2eAEjIhrap0KJc/h
23MhfFhFnqgJL4N++AcABAD8H8GFVnnQLgkwD6AFwT4++YFq8RqnoOQBWAjSKSDwAiUgFgxgLYAqVR1Ixr9jl/YgorGFiTkRUYJE
CUi/yQix0O3fxIRV+i5RSLSLiK1IvIWgO+LiENEHhSR/xaR90TkaRHJC72+UQ0nACKSGI/ExEzojI/xORfxGRH1z02i+JyOs
i8q6IeOOEWg/g+6r6LVV9G4j00H9DVQ+E3vDVQ+E3voeUA/zP4rISQAPichkEdkuSFtopGCPiMwf9H6bROQF/f0H6bROQNETktIi+IyP8
78WkbI4sf2JiPwy9NpnB7XHXkHlYhHxNevxRvxaRyovfQFV/BmAHgMD0ZGDPNqF/h1IMTOUDYKHaDMpSr/A+T0Ldd9yHUjqCY7oQ8Vr9E9yVk+KQnJz
c9NxDIvFKMiOZPmBEmXhUUBt6/u0nuCV+kOd8+iE3n9UO0AJsNACwZOErWSvGaONuyXyVxIoeUYbSmIRQzDbFhiJLwHXSiyHp+h6ZvRuDk
ATgL4d4d7zOIAhwKwGMD/DvPvC/3nVxM5MsQ4Kd5X+k6PZnOaSfYSCpn8JnDnpQUPcMmFy93l+ckAfO34Izw0WM6wmTi/DCqWvD7F0D8hsZQDAoeRc
APD0Aoe9AqzhAqdzQJPafOBiQkWAMCtMNBgZQXVr0t4TemUGw6MuUPNQPTq43X3kH8ABRAVN2QvHitmUNgdHoNPUnCuD7QP/XXo6TvYdPkd1CvqrwqBQPM
UHNAoaTHAB9DAa9hb0nX1AeAUQ3DPcxoGe1CuO2nuJFu3fzhbsqYwU9Hpc9PN/xk8CwG5ICmtrmBfWIRkO8WMZbiUhPM7yaLXS5kBWBh/6aRMPQwVQQP0XujQDa
APxvvTLGJGjSnCTnSjqOLm/9ZAVw1WLA7PxUejL9ZPi45eruXN6uu+zIIw8QlM5e8Bv7F5PUNHxu7AQlLLMYTnvZ2Q9t/d6VAkRF4eg6sS3TGLkx1v6E7A6ClTIhCM8
AzxzQoSBqMEm4+ni5Xf8ObeEBo7EdDSXcrahlyzAmPqHxF0RMxv2vSBCPmABMjv7Uvh7SL7QVIqz7j9u5uH/0RtS5tHG5Nz3vJh2CQ7iEcmQPEvWHRVF9E6DCU+AX
xs2T1J+yBr6q/+qs0fe1uT1UgXyr1NlYOmNhyALtvo57nAVNJaAjDfIxxZsLgGp1VpXzL1mu8GS3EAyXqTdPLCCCD/x2fIXj62P7Vdvd1e5j1tD9iRDNLR7mNLHyj
+/gTV3ot7yO2Dn5XnQF+h0P3fAlQ1Bn/TEpsIEAIrkEI8FvUV+Bz7hF3kE4JX0Xzm0nv4XSZZX+cSmk1NNCVVPu5wBzdcyd8gm2DGjJUn7HKUhPK3+j8y+ZD0Zh0Y0xbL
GT6BvqxZ7Q2PqVemQHZuXqRoMPtCe0Jr1BHOyJSjKmoXNdGHQMpaqFKLa6gW8/Ni9Or3ioFJ1Q0Bj1JM0bmSQMjLSlTbp3HD35Z7HEyPyjGTQrPAKzvqBmObIYhfcMZnSD0
hw2/S1FCQn3pcmYrsfcVoANc9nQvCk9tW81GD6RRMfVDzmjU4/7Wc1pu1P8+DKoXT69qp0vBbEjP2WR4ay51CSh7EOjgM+qWM8p/bjgX6FmRL+zXwPakTsEpKLmtoxD
9gVrSQtLCAG5fsNaz0jqQXFmbqIP3yKpBTcSRHYXhRvn4qaeeVCGDPdVGBbLv7hIsSn0sdCaDHjUa64CIsQH5qMaR8e6Ra3FmVSCvx7sHZZ/XQcD4EmKvBx4eZHa
/5p3Ys7w1HiS3tSXvZLCr4IvS2R8CCqr4rJY4rRHx3rdWRSIaCM4gEuMNFcVe4aQ0y8I/vu4s2FwSh+BqfE3Uu5rOLu9NGr0SQ+mt9w+OTEa2jK3oA5N7Vn5tBOM3QKnNk
QNRiVCaOT2uNXU0lA+Ka5Q/Ogv+sqL3g2wUtzz8Hel6TDXeqgEVwBb/PVJN6fKUA1ICnSaOQrVFUgJ9dbRpsT7Mh5rBxUKlOXh3iPkY3L+6QW/qFUSKjUy3bG4B
2+aGNBS4XUIeZQpUHkXkqb3ujEKWOHZgiIg4Bf0d9Q0RbOKFk3BA0VfnAnlA8TK4QktbGkE2Y8DUh4zWdf8HxHc+0x9XbeLa7TPQXDPmnOBWIiMyHrq2cBCi
FbEQ+3dXy3VCDj/VoMRRtywCYn0W7Z3hq64Ms7vQKRzcIXt4C+cf60VNrfO7ER3jR/7wk+6aNeN9rsNhtdcVeh9cu6Nd+bAmMKPuC8gFm8hcOd8U0qdRvFcPzN0DNIh
RFADu6bnD4ZTaAZ2GE6RzfxI99BPS4SEh4HgfjvvbgXbIeCCDvQ1rR3+oTsMvUjaVh8ajdR1dmnC1AcAxJUMJmwoHP7yrPSXF0c28KwTDhUJd1Qbbtw4+aFpvRt
kBHa+kd4ccfR1AnS2o0wvNrhhQWvJyQR3e8Dg1XP+xV4XpvA0vVsN4WkM2xg8KGbnRlGsUg81ZyvQA5CIudpiWU3lmhMT1c7k2ZxTJvHDOpS4k5tZRn5Zrn5yGjqqpkb
PaATfmbSmuPaRGMhYgsTvoq14xzkJGjbvMsmaoZxRk8uL2IHBcRCPaPHz6AJJ6QhXS09vWm6sOWcUu6QJq3CNc3B2cTeMT8LqiUIGUdyr4uOE0Wgwy4rqbRMf5m
P3qxHbH1zOtb4MdKHA2xeqeTjH4Rl+AIdhBk8pfM5+l6GM8+s4MsR6IhqR7C0hdxqqY8dfmpw7sHjl80YSoMnJ1l8i6CmEJ8HD/mM6B5jL8wW6Hi6Cg0bZZkvn
OSS9nPnfNn5L6CQoMdb4zBXqoELSr9wz2qyq2iB0WbMoMpv1IiR0PsuMCt0W9i6ocgfLmeVqzRcnjNTI7DvjYcBk3AxwoCL0cpQVqMYiKJi8c0dUHkR6ZXfgMS
hDBJNuNNgAFqy4WiWo2lLF1wWT9w2n8SoWuhjmOGfemm6BQ2W2ktRqCz4vIH6BGqm4rdwBzuy8mzCxJxXkzsm0CyjjcHuNuAM6CbGs6YczX1Y1qdOAIuXeAz5VjNPB
cBWBq6IvKBwgm7mEX//8REaWVLRPzGB4D4Al9OHwNwHdDj78M4HOhP38GwCQRmWZCfERkf34AXxeRGSIyHcD/BvCDO/BvCDOK/fAsAXL

qUI/b1LOgdU9TUAhxGcgJklIn8B4FOjiLMGwEoJTjy9PPRvFwAoivUXQqUgT4finRSKeS1Cv5+IfH5QKeApBJPYfhH5iIj8uYh
kAugC0I3gqEAsXxSRktCXkL8D8Ex4ychQIj6AYAnNcL3lQ9kCYJ2IlIZiniwinw89NwnBmvZ3ADhF5H8DiNezT0SUdmMiMReRX
AA3IDiR5yUA38OFYdyvAbhJRF5EcDJTB4IXZyIio76JYAL9awC/AfCr0GOxbEKwVnyviJwB8B8ITrgcygoEJ22+F3rPHQB6RhJ
kqP77ZgQnZf4hVLbxbwguodgQ+2/Cg2By/UcABxGcINkUeu4jAP5TRDpDv9MaVT2GYHK7FcFk/bVQ/P8Q59/4PwiWI76F4KTNr
170/HYAVyP+F54hqeq/AqgD8FRoZZVWABWhp/cA2A3gD6E4u8HSFSKyGFG158idiBQC+ImqloXqGX+vqrOG+Tu5AH6nqpwASkS
WFlqO8Heq+g2zY0knCW4cdK+qLjQ7FiKidBsTPeaqehrAsfCQ1tAQ2fdHXl8lxrhYgKMXJG2Vk1+XpeL1DnhTOGGt/4ImhIKmuLCnq
T3yp8n0cz5NtmmSIbOHZRanKntN/MVwcaBSSxEBuh4WpzVmCb54L0OqZuawHs1T5Y0lIjyS+2RIH+m5N1J7o+PvTfPwOY8OxCH4
rUDQwJYJ0ICA3rIJ6nLsAWQbL6K5yCS77PF5jgTSrv4BYpXzTcw2dCOfVCYYeYX30yyTGz4Ye6R3VHVkj7lbaZq6vUyBxxW8k/Dc
lqgBTuqJ/+f+8+57EIHuH05ZvjNsKqNTs4/Ye8bbFG1O6o8X17xMYJ6XjL1x+N4o1aJEXRE3CWKrw1Grt7VdmvnfV5CfrfKPSQY/
qn1y35hXD0x9D7X+fiI3oeYq3Jd8vLVTg+M2/bsJKNfWvTOp77jWOO3/tmv3UmTmdtFRd1hfJW+ou8u5LVs4aNR4IZsbqlVu/sAQ
oP3Um1IVPN2d5Lfgb6vYp/hE4/s8TJvhIjJKbk2ddtknYI0Zm4NdQGy8MVJLlz/Mt/aU8qh17m+uKP3Mp+o/rSo6ofZm6yrvGMp
lAsbw6tS0qgnfsEx2bHcOmvd8o8OtrbZvVdFZp9ZjvTtGnV1N2Ls4VT8aPxzgvWEcyfgJ++m2O1Itpv2BtbxYEAYsOBifZ6Ia8bsp
aAD8+v/rl9MfIr2OMUQ9bFvMHsbWYMsvXSsFovYZSFzpJTh9nLLpFIOCq6Dd3D4dOQR66lI9AHexwt3zAbL1kLTCKi9+mwfjrWwL
ni1z/vV4vr/9x2H0ZaybmRDbAlX+IiMYfrsplnN07s1jKQkRERGRBXJVrZNxud1Qpi12ScoCJOREREZElcVWu8YeJOREREZEFcVWu8YeTP4mIiIgsyO4TGck4JuREREREZEFsVVucaXlJayiMgnReT3InJURB6M3PB5yPf6rJeSw8PJzUh5yc/HNMFyNTs3STSRkLFZ9T4WiUSy4tAP6i8fx4Cfh3

AMAnAJlXdnsKYiGgc4Nq/RNbD89I4jjKMP6lMzGWIx3SIf/96AIsBTADwCxH5D1X9Q9QbidwL4F4AyM/Px4EDB5IfbRJ0dnZaN
jYrYnsZxzZLzLx587B582Zcd911kTZ78cUXMW/ePLZfAnicGcc2Gx7PS+PWr1+Pr371qxARdHd3Izc3Fx6PB+vXr8esWbPMDs/
ybHleqmpKbgD+AsCeQffXAVh30WseBPDQoPuNAD4f732vv/56tapAIGB2CLbC9jKaObZaY5uZmLSoq0paWFt23b5+2tLRoUVGRN
jc3mx2aLfA4M45tNjyel8Y5HA7t7e1V1QvHWG9vrzocDhOjsg+rnpcADmuAHCBEkIEkIV
gqcs/pjAmIhoHuPYvkfXwvDQuvPNneXl55DHu/Dm2pSwxV9U+EakGsAdABoAmVf2tiKwOPb9FVdtE5N8A/BrAAIDHVbU1VTER0
fjBtX+JrIfnpTHhnT/DNebhnT85YXbsSukGQ6r6UwA/veixLSRfd/w6A76QyDiIIiIiIwrj0n3Futxutra3
Yv38/WltbmZSPcSntMSciIiIiIiIiIiIiIiIiIiIiIiLsvua3Gaw+1yGYXvMReeTzIjIp9Oxevi8j/FZE/S31oRER
EROOX3dfkNovb7Y4qZbFLUg4k/SqWNmdVeZ0dEIn4VKv9c2RVa2rPUtoPL+wZRMtXZDhxSYhGZ/IZDRBRM1hJHpsyjT+kKA4ikMvZOgyP7x9v+1j7rq2IvEWA
uxCUcJLTnWcGAozKMMh4NKwSb9+a0r2k0I0xTyhOH1cLjJeG+hbKbYXm2aNaLnxJKKQNZY5HrwnTaZGVyjDCj9Bq0ucuT2rNyCxWGrHiNAYRNBaLnrmagtcpIn35Q/EUmW
nZMVXhi1y8KaRB8F+vKuzz4xYspgZ5htdDrnDdHnmmJoQ4yd4xKSxfHoY/fMaVbBh9uhVJYHPi5/pS2WJNg2KQHd6EvyrUSDq26BZaLDWeH7HYtZDHbpcZUoIf1U/gNX/fQ5VmlWcq1PzTZqFiTJrO0VSaXt7hcepTv1y5aX5PmbPtZ3UWgmmS0rn/
Rc4wzIP3zXYRMAqR7R92jIuuxfdEC5Mbi3+L7i3+yO1Fde2N+x2bmGO+W2lxeAiDfffhO0i2wiCbhj1GnLJ4Z8+zdUgpKnIjxMyzoMPXkaWcNSqLa8FAgoQZIrr/mZY5aqGkwxaIO2AYVmVvHYXjZdNj0AZR/JFsEzIlK2cEvZnsrH+T5b0ewjcFaXLOGd3d5L+x6Lj9tEd/CsD+LnMPVGTzPDwxzN2PX+R6NXk5jtuwXyXDlzoNI2CcYYlCJ8/qhodnUFsScbMfDzQWqXm/Li4VCGHp/UKcfh/p9gjFjuxtrfSK0//Z1aLmzzGOhXm8qvztwyg0hLRyvhDWaAQZRHEJfhcwN4HvXZTaTVfQ8gXKwHLsvXC4OfgAb0Xg7nX/3lF7mDGoQJDjI6gGDhNwxXwFFC7Dz4H1MOpQEgjZ1SmEECcVmHgAM4Kof/7XHbxzvcfbfe+Q2CqXT3TH4XNjU8tFFXeGOE4C9L6Vk1Ky0ZxGe1EKtyZR/gJGIP7mItMyjJNKh+ZUzkzcaeRtMVmaPjCJD21AwIGXa6fHL3XHxtcIj/Nn4CqaqfYftt7QLi0Ioe6LrBr/EnKtXhXQQjcybAnlbkvbpNq0wvqeZ6MZ5dAYqzmVo/3Vuyfb5wzSZwOYZh8XcrNZbVrJZ4MMi8CbkyGEQGh6lAb16j3T6TqwJ7Av+2g3Vkd3cH3sw0RuTDakUeVGdnjnzYr4Tb5iSGlmB5lMQdy7X2SmOjyRIrmSIeW4ZTmwDH4MjFhW5BBxQWc8Ua7+8pSJLyhKTgAg/5PAXH3RjO0ZCtGqP3KNpLJ/E0a7Wp2GhB6gy+/tAE4OrmROMg5Jcb8XadXTjAL7Ao1+SGndR3vhZSe1ZqsO0E/O7AeFvbq6JBWxfBSTXv5s7Ju8BYV7YWD/nX4zVHX6zjpe+n5DuZs9fIb8/cBe9CUMTudngy1nXAIETOZbG9mDZmpLzLPZ1+mLAfMgmXYIY8lJaE+BdtPyzvi4XWwXzUaaUmeqezPxRS2f/RLXTN6Ejl9ihmZ5/bJSj3Mou6lDPqeJGQYGMwj8kdmHNSpJKYOYhfmeUC5FeHBcs4d6c1nsqM+8VsmcDOPZzULe9nt6Py2+KcLcwjwaWqx0lRcJ2HehmWHD0XDxfM1AftV84D1WE6rhz0g3DDuQ4cPUYvEOYLQjzqpgZPdYZjBRErTj/9qcC/p9NtvyMDhL1DtTOQdZC/ODWRZ4NOM1Wm6C7x2XNNPJkT4oxGhtrODvaaqzoUZMPW7hCOrl1qbwPF+qCJnPTK6pC0RhBIgEh5ER3TRRVqgPO2CkAKyvZuhgtMK9fPVlGhEJDu2WP+MGsvN+TqjsKc/zAy46mMMwm++qxkctdQhH7Qm+nQUrJSw4FkN9jjDmMNTe8qwiQUJQ2+2nxKEsJqRjmbUd8TSZDBa0XZzpdE6+p4BHqsCLS+NGZcvVsSpggddOuP6+fzi6ApwNPIlhxwMnWU6dUhr7AuIbPFdo+qA4s/6Am/NKsHwvmnPp1VVGYMQKvoqRtd6z1oXPAmw5Ch1ruiEVHWTBLVfqxRn8Qi3AaxNYnN8XA8DzaZW+PxFQENxsYrXQz5PYZ8KGfWM0BxT3y9hZLFkvUdqsfDp1mIY9H8aIc2X7e9jyHGmFuxhKG5WxKfuYtxUZv0O0OtWuJKqN6wzP24HHTT9LFtZ+DXRdrFVbTW6qyD9rHz9m+M5bJOeGO7zO4UrgQqswz6NtvnJ8q3OV3+QFRMxPP4Rc5/E7rZzdmT5rQeFwWlzj9gN+JqP66bUhT69A6rh3MbVQaeJxLXjV8xoyWw5UcPwWLI1P/H5jq//Z9VlT9OO/rPG5WeJPX6KNdDoPFKbR2DWQxgKXGxPj6UI7SY+cGpnPyJkpWcRrnYt1D7NsRS2RB8YtfOyMDDWeElI1RMLwZrYkr8H4p4+hkbFs9TfVWm1AqZVfaOGRtYAmc9fiO4RwjuVBLX9sXp1WyjeKQH/PmXyPSz8r/QAf1cxY0WJ2RbX9ZgvAH2Z0vqSbPg/Y0Vbvqgnu0dnwCEH5lqvfLsO3WQIqMRxJ1hVBgNcEE3xlwTrpPO99wl5lNnkb3MPyFmuGdYH1Nz4uFMZ6Ag4GsJW0CF04bkHMycF6LxcSAQiq7wWZpsWmU2cVk6bXzDbTdVqM0UC+5YG2rlOEPjKyRzOiw6HXsfzB6XwThuC5k9E05lQYJjNkCr/zDHDfWiOlJV7DbKaYVQzDdbRdPT3qDYv6jQtyLdwAw0UAjSzDlTJ5w+yHbIr2MQVJhaVHmvnu0GM6kaCHpfM5zn9zmDfFz3u/1o8ZUcPvUDBRMr6QZYwqIpQKfDVnvyE0F1zLbU5zY5NqfI6ytWsLfnvaW2F+A1CmJBAEWM1yA8ZuSpmMnSGgKSc3evYaj5WtJhVEa7YhG8YvQ5jWXeGMd7kJmiTYZFbe4iFGmNRwm4Wnm3Wdbg3dkX6DxUnjHX3Mn1T0gIkZdjTZhELB4KH8DxC8B2U3Uv6YdRAr7uMlOtoJHMULhKqMrUYYPLUUfS5+p6Dl7W5EW5KbKDTkmqiQwnNmmJbf7RpHoJNtePsKQ/q7w3QF3P1uQrDfYl7OfYgvPmGBpmZYdnWRwF6ZfuuD2yRyGd0CtSOC0/GPNxKj2ZpJxP+Uy0cRBPuSOfZdXGQSGTE0rNvYJjHJ1Zx8SR3NqtQPhRdKJgyzwtzOQDKdNYz7c5H48AOkdtw3yD0/ctmIFiD/mS2ck5F/qR7ptQcu3dsbnGw5qc5GWgYnYmMwnCa2VmRLXBPBUoxzd3n9SNGUJ5GWLRdM4cCQVLPu98pHp0jgwTT8jQ8qaP7ZmT8eaUmu1pGe0/7n04AxMDKyRT6sj9Cw6vBxC7u1XIzvgyw6TGO4bC2cxT3/Q83CSW6EU0pDBvZc+T7YUr5s6DJvLsNJ8cQbsMAq5uFPHMeqsHNCDlhHaXB3lWkjUUuq4Q26Pv4E8EJLa2sQ+1FZrd3IvQ==

2ZoYWGhiogWFhbqjBkzeH4mgMdYYhwOh/b29qrqhTbr7e1Vh8NhYlTWZocvMyNNzH816M8/ivW6OH8/A8B/I1iPnhXqdS+J8bo
WAD+1a2LOpClxvMiMDj/MEsfzcuR4nCWmoKBAZ86cGdUzN3PmTC0oKDA7NMvjMZYYdmYZZ4c8I15iHq/GXAb9eSSTPT8K4Kiq/
hEAROQpAJ8GcOSi13kA/CjUa247rP8yhvXSlA48Lykd2tvbsXfv3qglJrdv344lS5aYHRqNEdyUzzi75xnxVmXRGH9O1BwAbwy
63x56LEJE5gD4DIDo9ZNshEvZGROeYDZ4VZaqqip4vV6zQ6MxhOclkTVxhRFjAoEAamtr0dTUhNtuuw1NTU2ora3lpnxx2D3Pi
Ndjfo2InEaw53xC6M8I3VdVvWyY95YhHrs4wf8nALWq2i8y1MtDbyRyL4B7ASA/Px8HDhwY5p9On7a2Nuzbtw8rV67E66+/jnn
z5sHtdqOtrc1ScVrvFrFmzGLFiqj2+uIXv4h7xhZs2axvRLQ2dnJdkpAW1sb+vv7ceDAgUib9ff387vxMEI+zxEyfPh1f+MIX8Pwf
x1FRUX4x3/8R3zzzm9/E9OnT2X5D2L9/PxobG/HAAw9jqg6sLAwAC
vZXHYPc+QYKlLCt5Y5C8APKSqS0P31wGAqn5r0GuO4UICPx3AWQD3qurOWO+7YMECPzKF
cjIyMAbb7wx/BuMY+GhX8oc2ywxZWVlaGhoicoxCAQC8D8Hg8aG1tNs8y+Nxlhi/3481a9a9a9YgJycnkgB0dXVh06ZNLJkzQllZGXbu3InuDB69Ab7DsSo
rK7Fz587IMnbh+zwvhzB/VHXB2dKZXf6Edr13TJ3bSbZU9dJBy3NV2dGk1rlYmRoaenB22XklnWK16m8xtSWMMy1VO1
G0AfhIvKbeqi7/cpOrLDhElhmtyUzqEk+/wcZWTk4NHHnmESpbcqu/ABQ1uXo5SXT/F6cT8z5+UT1UB6vMxUp0sy8O1oB6u7HnShe69kjNvbwtOSmDgGx/jg9/HxCxvKdbUNvDFdgT8lp/AZoEf8XdDpOXIHOmeLtiEVxpcPk5oSZvpFKqNG3g1MJRcONiIdZWiXI7DYCWUDR1dK0mvkz97JVbKuKkCgS4bEWfMtQ+ZYg
+JRqrmDARWUtfXx9UFR6PJ7LCSE1NDfr7+80OzbKYYxhn91W54q3KQGmw++xfIiKidLnrrruiVi/5Vvi56667gm1wFfYhsd3+MJQCyNAe5ybGQEazWnnhYbKyQ2CvCrqqhbB
mM+HnDInMia7DyUSTRW7dq1C3l5eQCCNea7du0yOSBJTBjlQ2MKFC9HW1mZSRMYwMUwDpkTWYvdhzKJxq8K9vDy
cOnUKEyZqczZ85EEnUaGnMMY8byBkNERLZk96FMsg9umJO4iRMnYvLkyzgwYwZBxcJrLHJqEAPfmeyAnTkJ6SMjQwYGCu0q4XW6Nj7+kuMSuecMXaVvqWWIFDNsAnxmjbyFBNDbY7fHkDn6VkBAhaZBwNW
ti+/EdVbXW7/vrr1aoCgYDZIdhacC3OzlpaWqsPh0NLKXGkYlHVZgwYQJEBBMmTMDkyZMxB5jx3DSmublZi4q
KtKWlRfft26TLS1aVFTEdovX6u3bYjLC3bo46x7du387yMg8fyJ9WgbgsMbIc01Pt130eMjjJbGy8yo8NjLDGlpaXa0tKiqhfar
KWlRUtLS02Mytp4bhrH48wYtpdxbLPPRsepnJhPzNLHqAWAlvMiMDo+xxDDJNI7npnEcmTGmublZZ8yYoYWFhFSoiWlhYqDNmzOB
5GQePsdGx6mdmvMSckz8prew+W5rsgSsZGMdz0zi7TzIzE3evTAyPsfGHkz8prcIXmcF4kaFUcLvdaG1txtf79+Ha2sqkfBg8N
42z/SSzNPP5fNixYwe0OHTuG/fv349ixwYwcnZcfBY2xkPB4PsrOzUV5ejFdpitra0FADQ0NJgc3fCYmJNpgmVWRGQFT
YN28eurq6sGnTJrq6sGnTJrIJrNDIxrXwglAeInJcALApCk2jswYw1EZ43iMGefxeLBlyTUm8iSyE5T+USizLGBk7l2WYoaenB
ABGhmtMJ45lGSPPYPXq1ejPTm5pxaMFMIhpLPB4PtM7dtip6epkTEPAxEkRD
Xr456bPXq1ejp6TEpImPPYY05pxaFMIhpLPB4Ptm7dip6eHrhcLqxatQmxXJm4KiMcXYvyzCDy+XCl1bIj3lALBlyxa4C4To
0ocE3NKKw5lEtFYwaTJOJZlGGP3sgwrpb2kF92qWMpCacWhTCIaKwnYnTdnZ2Vi7di3VZSLLeowFTCIKwYnTdnZ2Vi7di3q6uqwdetWs0O
zLG4vb4zdyzLM0NDQgNWrYqUqbStt8kWGPOaUVhzKJa25KrXrsXr1att8kWGPOauVhzKJaKwnTdnZ2Vi7di3////UyaYvD7/fB6vZGVf
zIyMlBVVQUA/AyIweVy4d5778VLL70UOcauvfZa25RlmKWhoQENDQ22HJlhjzkREdEIOJ1O3H///WhoaMCePXXQ0XKGV+NbBzyR0q2zNZ3yX2z4x////WhoaMCePXvQ0NCA+++/H04
n+7yG4vP50NjYiPLycjidTpSXl6OxsZGT/+LjH2DKlClmh2ZnNziMzvHpQWrHHHhNLF7
/fD5/NFepm8Xi+PsWGwzYy57LLL8P7778PtduPEiRO4/PLL8cEHH2DKlClmh2ZJnPxvXEdHBxYsWIAtW7bg0UcfhYhgwYIF6Oj
oMDs0y7J7nsHEnNJqcI9JeIipsbERHo/HFicM2YPdL8xmYJsZcZd+rUKeTm5uLkyZNQVZw8eqU2aFZEif/G3fkyBHMn
z8f+/fvj5yXK1euRDZk9yXK1euxGuvvWZ2zc+iz4tfvj5yXK1euxGuvvWZ2zc+iz4tf0vaL0q0Or3pbBDi3OGBDp7927dsGGDOp1Or
+JxNnLhaxnFx/PSuOrqanU4HjTqfn5epwmO5Y256om30ZrXEnMO/xjDJNI7H2MhwyNY0tJS9Xq9GgYgYVrypUW0Wvk+x8Tg
bGSbmieF5aZzL5dINGzao6oXjrKampSk1kMfKjhoT8xRiomkMe5iM4zE2OkwAEsMvgPKM0C7urpU9UKbkaBdyRZImhlOd5z7sCnKmMuzzKPD48wYtFBmf5S3BVYIbAhWp0i7ZWFsSlRzRXjp9eoQpU4b8xO0CbA0V1a
bBIxBriJeZclWWUOMvcGLfbDZ/PB4/Hg6QNv8iOn9Hs9elrSMRvcl5Cyj2bo2TKzmGwTk/wbNEF0W3IJHsqNvQbUBm
7VW9W6zFX5VDmSLHHJHE8xkaOx1liOJplHNts5HheJobHmHF2qMsHS1nSgxcaY9hexrHNjGObJY5fAI1hmdnI8bxMHM9L46qrq
9XlcikAdlclrKVnKknIejwfZ2dkoLy9HdkoLy9HdnY2PB6P2SERERERnmdrvR2tqK/fv3o7W7W1lSVmw7D9QwO6u7RCAAQ3d2
NhoYGs0NKGNcxHyWPxZhwZM7Ktwr4agrq4aO4OJSULkCGprawHVgcC0VjJ9vh8/ki60t7vV4Mmmru+fUo37WIw/7DEfpa1bt6Kur
g5r165FdYq7q5FdYZ21q5di7gZ0i9L5eLFu2PEVFRbtSEfFEb2JYXp9PR7uz7Vkmu7Ls0CyKVjsIW0m8qrPbgG0ZFbX5RFTERPMZEJIJEPSeuqRPVTFSEZcuaWJ+sJY3
PZ0NjYyPKy8vhdpzPRP0NjYyPKy8vhdpzP6Zbc3GOzYVGXhm9g3HgeRePGt2H8Xw==

nTiAnJwcA0NXVhcceewzvvvuuyZFZl9frxbJly5CTkxOpy+zq6sKmTZvMDs2ybL8sW5pxuUTjsrKysGTJErz00kuRsowbb7wRz
zzzjNmhUYowMSeyuPAH1uA1uX0+Hz/I4sjIyEB/fz+ampoiCcCdd96JjIwMs0OzBRExOwQagwbPlwl/kWlsbITH4+H1LIbe3l4
89dRTqK+vR0lJCY4cOYKamhoMDAyYHZql2Xntd5ayJAEn/1CqsfzHGO78aZzP58O9994bGWXIycnBvffey5GZOAoKCnD33XdHT
Wa8++67UVBQYHZoljR4hZHw52V7eztXGIkjKysLH/vYx7B+/XpUVFRg/fr1+NjHPoasrCyzQ7Os8MjM4AmzXq/XNrkZe8xHiUN
zRNbEnT+NOXLkCM6ePXvJtezVV181OzTLsvuuybbOnGJTmN6+npwX/+53+irq4u0mNeW1vLToY47D4ywx7zUeIkM0oHjsoYU1BQg
G3btkX1mGzbto09mXFkZWWhuro6alnO06upq9szFYftl2UwQnsAY6z5Fc7lcWLZsGZqamnDbbbehqakJy5Ytg8vlMjs0y7L7yAx
7zEeJvUyUan6/H2vWrImayLhmzRoAHJWJpb6+HlVVVbj55psjj02YMAmRmVtvb29aGhowHXXXReZZNzQ0IDe3l6zQ6Mx4
vjx49i2bVvUSFZ9fT3uueces0OzrN7eXvz85z+Pmi+zcuVKnpdxhNd+b25ujrTZ8uXLbTMMyKqrq7F+/XqzQ6
xoqamBufPnwdwoXfp/PnzqKmpFDh9Dd3R2ZBJqRkYHu7m4c0OnSIsro5KmFStWYOfnFSt1Q4D/xyEyMyINYC51a9WW2DIRHRwsLCqI1MCgsLVUT
MDs3yrLrwv9UA0JkzZ0YdYzNnztTg6UtDcTqdmpeXF9VmeXl56nQ6zQ7Nsrgpk3GlpaXa0tKiqheuZWmpiVNbFY8y46
upqdTqdumHDBt29e7du2LBBnU6nVldXmx2aZQFQADp16tSon1b6zESCDYbYYz5K7GWidCgqKorMfzX3
4wQ9+EDWS9YMf/AC33nqr2aFZltvtxqFDh6KOs1WrVrVrVrHnN47Btazh639tba1talnTjceYcYFAALfddZt18fabPbb78dgUDA7
NAsrbCwEG+++SYA4OzZsygLLRNiTET81Hyer2R+l9VjWxkwk05KJl+8Ytf4L777p96sOtt96Kn/70Mn/70p3j0Ksn/70p3j00UfNDsnyWltbUVFREX
fYvP7/di1axd2794dVZZxMHGKYYfbs2fjqqV79qm79N8KKVOmAAjO//jqV79+64qVOmzV7++V+4+f8Ytf4L777p96sOtt96Kn/70p3j00UfNDsnyWltbUVFREX
SWJuCkHpUp2djZ2796NO+64A7t370Z2drbZIVlaXl4e1q1bh40bN6K7uBh40bN6K7uxsbN27EunXrkJeXZ3ZoljV4ibHwqiyNjY1cYSqOs2f
P4oMPPsC5c+cwMDCAc+fO4YMPPPsDZs2fNDs2SeIwZl5WVBY/HE9VmHo+HqyUN44orrsDPfvYzfPrTn8bPfvYzXHHFFWaHlDAm5
qPETTkoHXJzcwFc+PIX9k9D27x5MyZONIgHH3wQFRUVePDBBBzFx4kRs3rzZ7NAsq62tDQsXLox6bOHCNmq62tDQsXLox6bOHChSzLiOPkyZOYNGkGkSJky
YAIfDgQkTJmDSpEk4efFKk2aFZkt2XsTNDb28vNm/eHLWJ1ebNm7kqyzCOj3j/843j22Wfx8Y9/HEePHjU7pIXGWUuFwip
ZrL5cKHPvQhHD58GAMDA3jzzTcFfrt3Vx/+jzT2YFy9cADwAgQKJu97NJ4DGzmfJaJvvdRf2vzMkPkMGjYGFGUvH5Gz9hsKxP3OoUoX0zK4T0WTpJWhhKy4YSPdBQb1R/x//rLC
E5jJ85zvfQU1NjdlhWRI3GDJuqHlsy5cWzW1tXGvw/TxuTRMRmxjSaJjnwyXBkZE6Pl3F2/Oi6Tc+Pf0VUE0T7j8vXyDsxBrRT+YzHz3o5tP3cgD0N/k9wX3Hf61xqgiXfX8quyj
2zYoC6Xy8So7IGrsiRmyZIlCkDvu+/8fGPf6z33tAfAtAlS5aYHZot8DhLMFMA5cMcmQoIuT5shYWFqrD4dDCwKdPHm
yFhQUmB2aZfG8NK66ulodofm5+crAM3Pz9cgbZbKkf1UVMPhjMmeHmMhpOjJo6QL3nhdj
jz66KNwuVyorKZEK6+8YnGS98z5fD6ORxNIaERxMG98z5fD6OMsRRUFCAzs7OygOaMagmJjcFp
4Xhp3ww034PHHHH8fbb78NAHj77N6beRnZ2NG264weTIEsMa81GaM2cO78vEb1WHOnDlmVp3F7emLa2Njz99NPo7u5GEI
BBAd3c3nn76cnnQmGS6f/mIRGpNzjx0GzbAH6Fw35tbsFQgJw71XoD6hFSG5ZmJjo6OswMy9J
TGYfB89KYmpoaTJ06FS0tLdi3bx/a9aWlowdepU25SYMTFPgnBCHr4wh+/TpcLby3d1dUWWl1yzZg2T8ziKi4tx1113ITs7
cjOzsZdd93F2l9KOn5pNsbtdmPTpk1Rk/83bdrExCkGGTmQ6Ha6Q7EIwD+dDDr2d6lKLRGmQYBXKISJJjqxGZkcyXU8A9YGUg4p
QkGdlZXFoLoaamhr09vZGbSfc29vL7eXjXjbnDnbu3HnJmqxLiwxOzRL8/v9vgp2tDFOHTpHJDOwnhjmy6kAiM4HCsMdrRiKdyp6aDmfj1BBGfkqtLCoQ3jmvUiWhRsqv71Ngxc2ohvvqdQcuNKQ9CvcBiU2CbX76qNBf8uHBgjc8aVDLeHkNI4FBuR0vJ
q1+uNOs7C92lo3C7dGLaXcaWlpdrS0qKqF3KMlpYWpwdxFBQUFBQUDDDkp20qTjBFn8qfpibbRm9UScxHRwsLCqAOgsLBQRcTs0CwJg
NbX16vqhYtMfX09E/M4AGhTU1NUMQ2i4MfZsaJiM6YMSNy/SosLNXwAIAoFAUEeZS6XVlZW8ry
Mw+Fw6Pbt26Ou/9u3e1tHw2F2aJbV3Nw85LXMSh0rHNpjdLDEdTFKBVo7Ct3fQFzfBTRvDrSPmOXVWRxRNDDXXjIkpKC4z1MxFH1ZTKuCSAMRRJu2Q2ptT0cTLPFGPAHLPwC5zf01vJJGrvABIpDKJL
pyKcEekrKwMlZWV2LlzZ2TIPyfW4BfSkQwc+ZMNDc3ioui3JAPVP4wn3mR4BjTBXxDlbxL9jtpPv2DjCK9nsPfezGo6uQ8zx0jm7UPUPwQ7AO
PkjIyMtDd3Y3MzMzI+tLnz59HdnY2Y2+vv7zQ7PkjIzM+FyuTBjxozICiPvvPMeOqnW6mq6urWzMDs+yrF7FLWY25iGQA+BcAtwBoB/BfIvKcqh4
BwOB+bPn4+mpqZLtpcfGBgwwOzxLmjt3LjZv3oxjx47h7PnzOPbwYe6Kc1LWY25iGQA+BcAtwBoB/BfIvKcqh4
Z9LJjAG5S1VMiUgHgMQB/nqWQWXHqaJPhdQkk6pwXorHbUrkwtahFQNoyUA0Q/2+4tDT0TIx11/PjBDdGlddgAQ5EOkzUzuXLvpdZnY5c9wCvXQqNB0wVVCS4yDn5gaMm0IeAI8j+2Qxjkpvd2
d/eP3nIA1I/w/BtyzlCiAzaJ1MNC3ivIgVE9mvvqahDt7mggfaDbrBNaDKzdbxeP1cQTzXNL/0FgxlWM1IMt/4h5b9eOdBcP+ixr3bXBlMIjsCHw2KuKPdzk+gv0LXNVGTzAfAPrEYXGMcaMxYwx3/T0bOxI+vV9hIV9PTc+qqEcn9/A+j96TfJbYcjxnEK4WnF6EVGU9b+0TpB6BrdNb2ygYYtPjx8cVIeECAkI2/p3CNlD3UF2xMJHEbfqvlGPmrm
Lt79+6oWlZOmI2tr68PfX19yM3Nhari5MharJdhlLzbz7+rKdOH9S+r3D3+R8Xg8WL9+vdmW3kIDD+2pYqoWj4HUdP
4YYlY9+lSbrcbbrcbPg6cpSEf3GWZgJrbc7cpzZSSonf34UwFFV/SMAiMhTAD4NIJKYq+hQa//2y86xqgx9fX1LWLNmTdTcx97lTfvVTWYvQO9evNJ4uJD0zZ5kdn4rdKSGNiRS
fceBgYG8N577yE3NxfpVLM3yE3NxenTp0yOzZLsLkhCTyudpuVKkupgpsqvbUCsGgUYmOnxHkX0ZibPfa4JAUalLVB75w72O9W7OQLo4Bzp9Z8aHZZZlGVA7Xr+fzjHgvMdi
ySiarYVsnF
4EbW1tVi9erXX+vDMQXJU6oQUyGlHIHg1b/vHnTjJn7BQgMuro/KMIOjbuH7uPr4ts3hZLSsYzG8Rpqrrsr2xxD8KXd/uLLpkgUeuRhhPkXWMPmDxAUkbBPkhhF/PPpjrFnT86//zbrz7ni0kqTKhbWXejxa1LFi9IbMTMBJmtLitRNmOVC9qSJp7wdMvNgVT6Vrr2aASm7HMSiqbKgSqmKHUfzTc+ptWwUrb/sq+tIVkUqdQgJqB+AXJ+7ffIsyJmi+aEzBSYTKRGkUSbZ7mOeE8eGYNnaUKA4ETgaAwb+29F+u0Cuk8sIpDgy4T3Xma2xBxFEm8ANmrR3P2+i0e2+ASTUcCSkTs0T8zNxSRXGvtlXgdC4Fj7yGQwRhKaOEomERjvBXPEVqZRXkWh6Mgq5bvbbfegmiEk/3YAxHWfDFAuKKE+dsknu1o0B0uMeirdpKYFq7pY/Vxfi/qH/h5uUBYhUyY3O6lg5fo7t2wX2kZTbfNXX/d+MeSqNq1DvGTm0SPlpcMAY0MP53/GoGSs7/rdpFNjE8NrYaz95a0D9Lqo5l8ZSg7Io1j1rR/1jqXUvcOK8VZDLcewNRzCjKS2dfzw30xHRRLj1QYHHvbyUVdnVs3R5hNiB6Yc3B4n8rz2rpYSVeI/iwbOf/lWtuPO/LEW9z6HTf8G8h1cgbzXQyI+ZiQMb2wYW2vZnaUY5HeBBMbaHMNxd3PfWBFhMa9pa2ZmCvxUMbp7gjpuVFqy4Gu/c8IgNaAIzvUlG0JFOTTLIJTSchjyGXjdmWehixOAiSD/H8BEWqpSPuwxWBqlVVUI3d9E+TuSOggsdl9IX28/IqvI5YsGUdEJ3DjZnBlXbTnWb8D8ZEbgVuqRI/1RHm/n1o8mbmQ1u28BxBU9SQsaCWFi1chTgqcVDPlEfXTMZOK4FXC4BxQb0b7BpHuFGkjH3r6QvFBl8j8wQIGrWy2c6Sh3nGt/gBtUQ3PKUhH++H2z3
7dh4fzCN1Aq6DqF6oW4MBUnKfJH1+O+5HvSJ/PHEo6CtJJ3JtI2UJnmXgzOJ5MvHNpq6Xt6GiT8JGE8OM0oDB1UojaPYwDG3q2n56zV8owF3M8jNMzbKv2HdJYk0e7rhE7ZoC6DJdGd1Rj6bQhp3qgkPc/KNCbPuJnZ0jtrjbQ3bz3jcV9HdRAgfz5jSQZ/3p5TYBN4wuMLhIo9RB1VLLZKr9ZaPKJRfJrn0d5/M5k0+6OMtqaGfjkMnTCVLqjG8z46lUTc96qxhFjD5SJjfQQfxGsBMEMz/Gu/3C90NgNpmjQ5Fe7xWy0b4bGUGNnhWVZ1iuDVHsm3X7lrXoYG6IwP1cq3xXzFzhhHKvB3UuiPdM2+gVkWtUvdPpR1xO9oRgHD6mkG8oqdT4JqyiTXyB/Xsh4cEy4zXDBJ1n9cUeXDhPwKn8ox7rIxKaNQZa0J3FTSzVVRbsfN79Iwjq85OO2vMR8RBaLBzNSPJCgbTSVz4xGPmPwJkm6xtMHlIKX6xZGRHe5CxJ+mR4VTmZPkmtLdBrNBkbwMbWvKPhC6jtmCIHG+DcnGk8JQoQNqaAgjHV+WKyzWAd0dYt0+gmNZc8rXg9Ll4e+6KmBbNnsNDEjDcxQu4i2yhI+DtyjRhFJYQ2mNyrXbAAHDCBMb/BK8Xf5BkkEDtwUtzQdfSMKsc2n0Cyq0Nmf5j0GfFYRpJjJWpXqeUu8bKxQ+qO6BDlK6eW9ir3vF05mGQ6bUaUKmUGsWBb+Ge5ePHQPWyBEx0B8XtUbQTLR9Vw5vRG3ufhjtR0Iia1G3bgDJB8C0F3CkdlP+R4GbPDWDmJXmEGrFmEH8f0HIDSavo8H2CX11EqFFdB3bsOC+7ce9G3QmN4wfC7R7CVv0eXgfl2sR1NM7ZojqGKSNb5x5XMQWyzuBNNaFyTCJHxNFkKBahKebGzUYK+Zsj4Fv9ZXb/mUGkIz6klLk89FJngjJZJfn2Cq1vd5Y3pOMOm1qMPlB4b7oXcPTQEc0V9DqP2WyGjeLt9HnnGkkPdB6lLkwzMsMFnOTYcJ2nXMCr5OqmLNy8lhdcyRmwS/SXuHoDLhsKvBT4DKRCO0Cc6kWhp0F8fFNVKVlkTkY+dbqsYIyJiw0ixGKz2z2SGh2N3hLjEALWyBOFEYZ3kQBN5aifJNzUL+1JxeuNtOtUvCNtxdDs7ke7XbmD+kH+mdq0z2lt0G+Q2n10kMzpZHxRJkfvDtKFJXFHtTk7F6sMeR1BO1HpOqxUK9+qZrB2mJN+1fvErGbOTvOOHfYWkOlNYoRHRtQ2YVC4CY2DlXsExR/TvYYSBYpX8DBbD95u6V+ZgDAr7ZAAp26qfTbhA2k1gjkXl/2lXfEiYjXdo6OLkWv+5p0CjqfZcBf3Sg+lzh1gMIt2wWaQRmePLL2hNt3ZRL/ZyjVvO8vX0sbUt7NXD6MLemt92VjJ6vGFXGR9DoQxsmMo9nLnzHdzpv/m3MBnmjG3kt6cw5C3+lS05zS+lKm9lpt8AvTJvFEY8Zy1KTwG/JUTg5Ml4ZX6bfYv8HtFnvBDB5RoHWu4/XTW7kzcmEGk08UHhJgvDwBp7TuTuXDkVPtiPU7/Z1KCrqi6C7Lm1yJxq8hdrXM8ZZqz2PB6Ae0Fq4zNQXgfttvC8eYKWH1G9rGi1CzFqP29ZrSMvA0+KHpDchWdSFugpZ4RZ3DoSQqRL3ILXD3Q/yR4GCz9jx3fW/X6GlNDeDlQeWFx/cVpfH4UcMWFQ4BNDhLvhgvlqIbDP/xD8W91rBd0Z6Bqt8u8V4ZmYLONUK7Uv5WElGRqjHZ7L

8wOz5IyMzMxadIk/OhHP4rq/Dtz5gzPyzisvloSV2VJof7+fogI3n33Xagq3n33XYgIV2WhpPntb3+L3//+95f0yvGLX2w33XQ
TnnzySdx333349re/HZmVv2TJErNDs6zwSgZTp07FBx98gNzcXJw6dco2KxmYoaenB3v27EFubi6A4KSzPXv2oKenx+TIrOviU
T+OAsbX19eHDRs2wOPxRJLMDRs2YOXKlWaHZml2Xi2JNeaj5HK5sHz5cnz4wx+Gw+HAhz/8YSxfvhwul8vs0GiMEBGsWrUKa9e
uRXZ2NtauXYtVq1bxAy2OjO4OVFZWoqmpCZ/61KfQ1NSEyspKdHR0mB2aZXV1dWHixIno7OzEwMAAOjs7MXHiRHR1dZkdmqX19
PSgqakJe/bsQVNTE5PyOI4fP466ujp4PB4sXboUHo8/HdXV1OH78uNmhWZbL5cKpU6fQ2tqK/fv3o7W1FadOnWKOMQy/34+ysjI
sXrwYZWVl8Pv9ZoeUMCbmo9Tb24tDhw6QUCbqvF5aBhUEbzfMYqdUpVVzSrQkdRrubrNS9UAoOJa1dTexRvB9Lj8Jy5kPgtMExKrc9JKbNfCUAn3AwIhjkHvQONwrAOfvwI+Hz0RbWyyiuT6y+ixyVk+GTGUM+/wFuqzSgm4i7lHtODGVhnfk43HtcKdG3k4PqzJlWN4N+0etvdnHP3oo6zLVXTM0zPEsMHBTGTQFtwGLCk4sEo3UaKtmpAEjwr5bC4Wq/Pzp+bBXmw+cn7uyHPM3kIoCMhwwpBZlUoCx1hbd79qY5Nb2sNfb5VPlaXq7eEq5gsd1KE4+1m3A8Adsy4sJdUUmxuvFdMfMJp8BhjiyV1/fi1Y1ckpkjXr/Sfq3cKw5AE5ZnFYiAqdbZLT0lUcY5QKYCWzrK5HgdhCoFuJLoR7mb8YpLAbGnIp6iXpXnbgQyJjmgHF5RZXtuggTkEzaK4HxKAHAQC/N8+9SnEqEPNDx4jcEbkl0x+2XGpQN6t4SDnNm4Z8Ok6wdRD+zdJbEj+UMsNOE0h+pxtjD4ebGtpsQCw8hdRLN5YBCLaaDZmwsyYB+uCaXdKI44pD5FKU5w0lHKxdCOpSpBV4xkwpBsPmI1JnfZugHxQ5rxyd4hMFkcEjHbFLZlsOLkHAV9r2+E60aIjvdNsUnjeYNtCRbNkV/mTgszI4zZrEUFxrcIKH6QGXkrZSoKa28oJKpx9mYzRxJNDGFgfqg+dIIqKI2GpuYbYYrYvs8fgGoOeH+xJDhDhbRQCLaXdItSTeBVRPyN9bj9KiKJuJjyXK3otr7MkSJpHZ4yJDnJ8WXMrOLDYUtLhKMKWWkDg0vEiRpWJdLbIIsnH93mBwJpXLl2GqNCpiNZSIFfJm9pbOVWtZh6/YzHCGpvuJjTWgoGYRpBzBT7pNGV0gtbEYZFbaZMCw5tYOZ3AoKYpKTCFcv1jrvOCAIEIElSZd/MdwBIJYY7f2cbZOgcwVqL6aOF8uPRCbRBF9TT4emPZK8uXlXEDezanKwE0UEGPAN8nMYLiJBcU9sW+n7p2RyKWYNWObLvQDLnMJp+6bIz9MPLwxOx7A2FIrAvpXM5AV6qGSrNFR8rAFGsAXnFt3mUE6mHmPOR3L1N1GdDx9z2YEAF5zYqtkG53dbrTk3OFRSC5ASHiNHP94+HG3vc9XJzJoSQmL5yXxwyT0N/gB3GVUzHyXh4yStUFkawEUXECQaTiwzMFsXlnTaFRzJm3o6xSQSOTMfNvEFq6kOpqAQUyZo0A8Kmcbf+Gzt1fSmahw4I9MVKBWsqpc82F3vCmYwLAb6LAT8XMTvK4RmW9p8c0dv4/5BD+h3ctUNVGlcpGy1SAxvNmuE+kT4BCKAUzZkNlLIFaXGvZAImRBVuvNuPQ2nqWnjsPHMDWmXvpWScI0dPdqGKNXp1Qf42+r9iFAAbFjdTFIfiknXA8iJhBbKBBOTBtX6eYQMXZmjNXaZcSRjeNXaqC6XHcbsfK5dOHSZMIbnY8gN7kFl7QKCVWn2lHSdB3gbjWBL6wYS2F1oGvzxzeddyMYNYwCDs6yrxtyewQavbJAWSqTszpKAhFsDBGLE59n0oJ9QDTxdvU0mo3bplzAtlm7BNSQHUGn8ZtDbUyrtiAJrhDSjcDxNWK1iM9lB2mJT0Aj5dTJLE6bOpZj5q1fSBZ+Qdlxkzff/ylxPjmcxqBYR/7u3SvF2v8+kP+tSQjJJFgnR7X6ATm/kD6pBgzzTVFcl4fWBqHUz0Qim+6pYI9rXAHzT5/BNtY0Gsd/82D6qF70hYnCSrJxGX9lhOMnzR6x3Ut/AgqYR+Fy7tuMr6NdMrvq++8WTfx1sVAOWwsSBH3XumDhtD/t2ojzCFM5mFt6BKL+hJBpwuyV4k0YyMDDe+2Fd+f6jAi6Ckt/77VbEVw5jf0vMZ/Ku0sKpDzWAzZodXzCGEPW4mKAHudHKxEzZ08hDmaw+OQZtEfNL7VJ9uZiMZynGehzVH8Ao4RVeT6NjUZ9y9Eh+ZqmS6c/9Dg6

JbOD48eORDYYuv/xyHD9+3OyQLK+lpQV+vz8y+ZOb5AxPRCL1vgMDA5fsOEjR3G43Dh06hIqKiqjdUnmsxTZ9+nS89957AIK95
9OnT8e7775rclTmizcS+tnPftbw3xnP521BQQG2bduG5ubmyPV/+fLltpkwyy4RSrubbroJpaWlcDiCGzLddNNNZodkC++8807
UT4rv7Nmzce/TpVQ1qsd8PH+4J8Lv9+OJJ56I+jLzxBNPwO/3mxyZdb377ruR40pVmZSHxNqQ8OqrrwZwaY351VdfzY0MY6ivr
8cHH3yAm2++Gbfccgtuvvvlmf PDBB6ivrzc7tISwx5zS7uDBg5FVRX7729/aZkIG2UtXVxfcbndkG+uuri6zQ7I0p9MJVY2cmwM
DA8jIyOCchjiqq6tx9uzZqK2/a2pqUF1dzV5zSopf//rX+NM//VP85je/ARBcLvffqq6/Gr3/9a5Mjs65Dhw6hu7s7sqxwRkYGu
ru7cejQIVucl9z5M4m48+fwwh/ymZmZOH/+fOQnML6H3uIREVx55U4evQoVBUigiuuuAKvvPLKuG6zVCSM4709RQT5+fmRLzN
vv/02e+Di4LlpDEsvRoc5RmLCEz8HT/YMb8oUzjfMxp0/yXIGr8lKwzt69Cjy8/PhcDiQn5+Po0ePmh2S6eIN4zY3N6Ooqgt
S2Y97WdaGlpQVFREZqbmzn8G0dWVhbee+89DAwM4L333kNWVpbZIVneK6+8Vi0iuvvGJyRETjW19f3yUrsAz1mFUxMae0+8p
XvhLZGt3lcuErX/mKyRFZW7jW95133sHAwEBkiTGumhGb2+2Gz+eDx+PB6xxs+C4/HA5/PZ4thTDP19PREfWnmkmyJmTx5MkQEk
ydPNjsUW+DKP5QO9913H3784x/jvvvuMzsUQ1hjTikRb8jy8ccfj/y4L1/4OrgGm2NxuN9xuNwof3IVWDv9
SCnG3VGMGT5YlSpUrrrgCTqcTV1xxhdmGMLEnFIiViK9d0S7N27N/hNNvMmfOS7NmzJ81R2svgiSzh5Jwo2
cJLJHKpRCKyq4yMDDz44IORuWx2+txkYk5ptWfPHIxduhRbtmyB6qPYIsKkPEHc+ZPSYfvTf34/LLrsMp06
Gs1jgRWm3Z88eDAwMYH7tTzAwMMCkpHWfEHhiSt2mcBCRDSUi9fkJqmqYn0LAi0xCz7HoeVkQ1weNTneu3evL
eayscecyCbYi+AewEgPz8fBw4cSFqQifT+vlZ3e9L+PQCYX/uTYy4vk+Tk4mk/p7pVl5entDrpC6x9wsEAqOIxh7YZsYk2l4A2yws2W021
ttrNOx8/TbDeG8vXv+NGcvX/1Qm5kMVk11cRJbIa6CqjwF4DAhuSZEXLNzbZXNLaZMYnWpLLNmC
bpQ/bz5jx3l68/hszlq9lqVwusR3A3EH3CwAcH8FriIiIiShShATcyIiIiiIjGvFQm5v8F4EoRKRKRLABfAfDC9b95cDt2bD0ReOxAB+wvpyIiOwgV
q8dVxgZGtuLaHgpS8xVtQ9ANYA9ANoAPK2qvxWynWL4I4CjjALYCPF9SFQ8REVGyqSpUFYAIPJnio3tRRRfStcxV9W
fIph8D35sy6A/K4C/TmUMRERERERER2kMpSFiIiIiIiShATcyIiIiIiIiC2BiTkRERERERkAUzMiYiIiIgsgIk5ERERERERkAUzMiYiIiIgsgIk5EREREREVrIAUVW
zYzBERN4B8JrZccQwHcC7ZgdhdhI2wv49hmxrHNjGObGcc2M4btZRzbzbiwBO2S8ytTEQOq+oCs+OwC7aXcWwz49hmxrHNjGObGcc2M4btZRzbzbiwBO2S8ytTEQOq+oCs+OwC7aXcWwz49hmx
rHNjGObGcP2Mo5tZpwd24ylLEREREREFsDEnIiIiIjApiYJ9djgZgdM2wv49hmxrHNjGObGcc2M4btZRzbzDjbtRlrzImIiIi
ILIA95kREREREEFsDEPA4RmSsiARFpE5IYzvJZlgFnSoF1SIRSzjbfa5XHXP9r7JS0nOaxfJKWmR38/xG4h7+J8RcaTY
0Sk04zfJV2S1WYiMlFEdonI70Lv822fqdUS/Jx9m8i8nLofbaISYZv1LSnSWfbaISYZv1OqJbPNBr3ncjLSms7fI52SfJwdEJHfi8hLodvaLvZvZvx
OqZTk9soSkcdE5A+ha9+Ha9rnzPidUi4J+ha9rnzPidUi2J1/9Jg46tl0TkXRH5J5N+rZRK8nHmlmBe9uvQZ8F0M36nizExj68PwP2qWgzgkyb0OMYtBUAZQ
DwIYL+qXglgf+g2xIgMAH0A+h7ntvjzFtiuD43hz58-dKMks71+DOCjqQ/ZdMlsslz39Q1Q8DuA7AjSJKeMnzUmHMNrtLVa8BUAZ
gBoDPpzp4EO3TRZSAkFzv/9sCy7qAAPAVPmKq3o2vRzyCiXQoMmfvkG5JPs5Oh/7oBJAFYExouImm4lILoC1AL6Z+sjwArAxr9
LoBVbXiBjGjlopjTESuBHA5gH9PXeTmSWKbSeiNeFeZNDEGgqJkH+AE2FP33wYC4DIAx1P+CySAiXmCRKQPQQwZz+HG5acA6B2B90P320GNj1ij
ba1xKVpuJyBQAn0Kw12BMS0wkYAd4A4GyqYrSaJJ2b3w+VGfxtKBEYs0bTXqHrFwD8vYj8DRdOJ62Ay9xRCPjdmTJgntNe4kq81Cw3N+AP+
CL5KQzXEpL4mekGsEPHwcoeo2kzVT0P4D4ADv4Av0EwIS8B0JjKeBPFxwBoR6iHwH4X4N62Ay9xRCPjdmTJgntNe4kq81Cw3N+AP+
sqn9MVnxWlKw2U9WlAGYBcAG4OUnhRxyRtdrunkD8PJvLZMVnNUloLyeCo30/V9U/A/ALAP+Qx
BAtJ8mfmV9A8DNgTEvCtSwTwcT8OgCzESxlWZfUIEeIifkwQUY95PwLwpKqgaGa7beDpWnhMtUhqsXbEd0WUEBLDJkkmxJaq9xJcl
t9hiAV1T1n5IeqIUk+zhT1W4AzyE4HDAZyE4HDomJanN/gLA9SLyKoCDAK4Skj0Opidh8yTrOVLUj9PMMgGaM0fkzSWqv9xAcjQl/+fshg
D9LQbiWkMxrmYhcA8CpqikJFiLSFKbXQsAqvrfodGFpwHckq+fodGFpwHckJqIjWFiHkdouLERQJuqbhz01AsAvhb699cA/Dz1kVkT2ys
h97x7uL9jR8lqr/EkmW0mIt8EMBnaJaSrDYTkdxBXzQBvgFsB/C75EZtrWe2mqv9bVSPXlMRZvkHfCp5y7i5ElAEgK4A+quij5EZsviTb
yihuB3AmFvNJonHmCI4+X9R6KHFAI4kNViMLSMFnphtjvLc8iW3WAaBERGaE7FnHEEZbIv/vPmmBv1EfS+C6C26BP94FMEhjpdCt1sBTEOe
V0M+8QX/nVQAnEVyoxoB1ASejxBQhejBBHmBeb8bwD8h9gaGaEncS7S7S2fW+rJNxSn8H9fgFqjpP/L9tj0KE
AYEe5tM/x2t2mYXvWchgFazfzertxmAMWAtQzvGfGgWAXRqeNM9CtBvfnvTNxXh8FNrsWWFHVf/kT
/RvDL4DSzfz9V5c6fRERERERERERERERERERERWwFIWIiIiLYGJ0ERERgGQPBTMyJiIiiIiCyCiiIkgm5kREREREREREREERERERERERERERESdG9ZqQYxEsiVA5CB4BrAn1TV/x7Be2Woan6G9eoAn9yIyQiGt+YmBMRjSRgAn5kREREFLYGJORERERERkAUzMiYiIiIjIApiYExERERERWQATcyIiIiIiIgtgYk5EREREREVsDEnIiIiIjlpjgzBERN4B8JrZccQwHcC7ZgdhdhI2wv49hmxrHNjGObGcc2M4btZRzbzbiwBO2S8ytTEQOq+oCs+OwC7aXcWwz49hmx
XVBKDHfBaBMVY+ZET8R0VjR0VjmNDsAIiJCJKH1XtEpEdC3S5PfRvnmYC2E8VIBKDSbmREREREQWwMSciIiIiMgCmJgTEREREVBBKDSbmREREWwMSciIiIiMgCmJgTEREREVBBKDSbmREREREWwMSciIiIiMgCmJgTEREREVBBKDSbmRE
oJgA+p6q/H/ykiDwE4G0G4G0A1YyC4SED3oKe70hQjEdG0J3GjMRIUGi+4hEfoBKQSxAVUfQV0o0Ed6FdLRXBVw0l0Dr4w5B0SEyGY2YLYgjbJDjEtQ0F
EwAvxaR1tB9APgugC+JyH8AgH8gwMbCXn1ioTg5E8iIiIgtgjzkRERERkAUzMiYiIiIjIApiYExERERERWQATcyIiIiIiIgtgYk5EREREREVsDEnIiIiIjlpjgzBERN4B8JrZccQwHcC7ZgdhdhI2wv49hmxrHNjGObGcc2M4btZRzbzbiwBO2S8ytTEQOq+oCs+OwC7aXcWwz49hmx
RERFZABNzIiIiIiILYGJORERERERkAUzMiYiIiIjIApiYExERERERWQATcyIiIiIiIgtgYk5EREREREVsDEnIiIiIjlpjgzBERN4B8JrZccQwHcC7ZgdhdhI2wv49hmxrHNjGObGcc2M4btZRzbzbiwBO2S8ytTEQOq+oCs+OwC7aXcWwz49hmx

      "text/plain": [
       "<Figure size 864x576 with 1 Axes>"
      ]
     },
     "metadata": {
      "needs_background": "light"
     },
     "output_type": "display_data"
    }
   ],

```
   "source": [
    "bom_mov_clean1.boxplot(column='domestic_gross', by='year', figsize=(12, 8))\n",
    "plt.title('Domestic Gross by Year')\n",
    "plt.suptitle('')\n",
    "plt.xlabel('Year')\n",
    "plt.ylabel('Domestic Gross')\n",
    "plt.show()\n",
    "\n",
    "bom_mov_clean1.boxplot(column='foreign_gross', by='year', figsize=(12, 8))\n",
    "plt.title('Foreign Gross by Year')\n",
    "plt.suptitle('')\n",
    "plt.xlabel('Year')\n",
    "plt.ylabel('Foreign Gross')\n",
    "plt.show()\n"
   ]
  },
  {
   "cell_type": "markdown",
   "metadata": {},
   "source": [
    "5. Gross revenue by studio"
   ]
  },
  {
   "cell_type": "code",
   "execution_count": 51,
   "metadata": {},
   "outputs": [
    {
     "data": {
      "image/png":
"iVBORw0KGgoAAAANSUhEUgAAA1gAAAI4CAYAAAB3HEhGAAAAOXRFWHRTb2Z0d2FyZQBNYXRwbG90bGliIHZlcnNpb24zLjMuM
SwgaHR0cHM6Ly9tYXRwbG90bGliLm9yZy/d3fzzAAAACXBIWXMAAAsTAAALEwEAmpwYAAB8b0lEQVR4nO3dd5gsVbWw8XeRcxA
QlHSQJIiCSBQQUUGiGJAMggkKigKgYMIIZsyAqoiCYwKwoYBbELCiicEX5EK9cDJjDNVxlf3+sXXSdnu6enjhJkl1Z84c3t/zzDPd1
VXVuyvutVNFKQVJkiRJ0oJbYrYTIEmSJEmLCwMsSZIkSeqIAZYkSZIkdcQAS5IkSZIkSR0xwJIkSZKkjhhgZLGEhF
XRsSTZjsdXYiIeRFRImKp2U7LZCLimIj4Wuv9XyPiftNc15YRcW13qVt8RMSZEfH++nqDup2r/xXID1rR0R/xURy3aXSklzgQGWp
EVeRFwVEX9YHDIqNRP3fxHxl/r3k4g4NyLuM9tpa2tnNhullH1KKKRdPY10RESdHxA0R8b8R8au6Tw/tLsWzJyJWi4gL6L6+9q9un
zW5+XiNikq+8rpaxUSrl1mou/AnhDTddfW393RcTfW++P6CKtEfG6iPhFRw5In4eES/q+3ybiLiuHhfXRcQ2I9a1XkR8LCJ+G
xF/iogfRsQx9NOA+ZSyn/X7fyfBVjHr4Gv4ACd0kSZJc4cBlqRFWkTMA3YDCvCvYGVj/bNRgfxGjxkCAd0CY3yD4DCvCvYGVj/bNRgfxGiUsjJwL+BxwDrAdYtakNWhc4aB
nAqcBawDrAi8G9h40cw3kf8Atg/ZjVFA9Tjaw/gk3B3oLZSKWUl4L+BA1rTPtDR114A3L+Usgvw8
c8ywKeA9wOrAxcDn6rTB3kf8AtgQ/I4Ohr4dUpnCkfAJ4624mQtHDNpRuYpHumo4FvARcBTwKIiGUj4o8RsRsVUzU0SsVUvg713
f7x8R19f5vhERD2rNe1tEPD8ibgD+FhFLRcTpEfH/ag3ETRHxuNb8b8bY2vbEG2vJ+c9qbczdpeURsWpEXKEXBARv4yI/4mIV47TtKiU8
n+llBuBQ4A7yQCk+c7jI+KWP+KWiPh9RFwMfDhiZ1km3x/Jrmv0TEzRHxyIjYG3ghcEitzfh
BnfeqiDiuL43/1dpm2/b/xojYDHg6cGp5QullL+XUv5TSvlaKeWY1nxXXRcSrIuLrwP8C94uIh0bt
/+sqXGJiE0i4uq6zG7YN2I+GAp5Q+llLtKtKKT8upXyRLnrjG6yqJRWaP1fQ+GAp5Q+llLtKtKKT8upXy0LvfVOs8P6rY8JPq
a/LX26Sb19Rp1n/85Ir4Dbt0JbT+bEET73BL5XSvnHqA1SnvnHqA1Sz6+31O1yR329bP39P3S4s8RFxe0S8G22ZEbVcp5eZSy
t9ak+4Cmtq8hwNLAW8ppyfyHIOEMAjhqxue+CiUsrfSin/LqV8v5RZf2s2c5/rNt55+irhY2+Wq6I2KgeK3+JiC8Aa46Ya975
1n/y+npfHt+bdlSKurfvr1xHxplaav00eyxsAJ4cBw5DfwTpmYQ6CrO4KlvNBeQ0XdB1zlJWVJKwwCJBkBQJJLNNp1V66F1AeCMqyJnEuqJq8eVW+kbd2
4HLYv4mhocB+wGrlVL+TdY47EwHWrHxBR0sdfl19HTLPg5IBazrbwmwCNUE0dIA3tjtGdpzBVCvc
8HXcCewZ0gIuqw+nl/2MIqi0hfBCHgd1CwGb5ZfuZpaC9xcyDXVZ2xHaHwVT3zuAf3/fXM0chFZ4ckKJlIG6r6rHawbq96
+A6LJwmyWefYDmO7BPuEg0CR1lfDBKKWWDAA0I1J1FZZ7WuZY5+GOH5XdXCRRVr6Rdn/rDoGQDq43FS3v/dZlqzQJdSasRpnB1GYcRr4u8FPqe9nG4r8Ju+OZ8GQ9FY3XT/+etIb4uSzvftc
YZHLo4MGmM9qGOGJu+6FLoAIqjZxQ+/I0N9nJmz/xqw0Bh8EfIzA6xeNwVwBC0a2SQjrGwXqUycd5RkqfEYxFkfCJ/A4QpMmaJtf
8XGeb5yJGUkfLu0GWHYVrebF9XLIiOptebHxhqkXzZ5/yd47kwbdODD5pGUPaQwiwzuqGdbhTWQpSYU/hDcjHJZB4Yf9ZAnfbIvlWoMvEPO9vbLW05DMtjW2QE9IpwtLpHmUMyjN9VzcUVg
aAVwxX3x6Lr2kMdP0/aJ9tgkpSlfm6qd0gpvUAnYOpyFtdBwB+3qeW6dBwSDtQJbaqvKLV+U1e45F4JqSuKKYv4EWjOqYTd5b89X+5Y
bvIl34izs7kNTp1JU1yxZqcfpV6ZhXmedHe/UA1pIfVUyHu0cHaYPy60mnGM6XFpIvE/sOZvvsQtH3Re9uhIWZcAfUuR3hw8gLe8E+9dQZqTPbK2gc3AFbhR8LdEycaCb8HXw1vRMTpR6U2tFLTU2PWtlm1wC8HnWYQXcktLdFbbTDLuy/IlzhdMQt
5aZkvI7MjyMPLrkPxncpPw6A3Qq1rgKFGyEk/ZVuyh+zZsU2a2u6EyMCdvTg6O6tswJLqJMW8BC+Cw/8qxXkJK8aq+c/eL/yf
nNx/4IMlX4XsfJ6GzC8sj+vq4xN6MX+xZkhR+ShFNhYeqcR+e5aeMI8xGS0Sy9pM/A63ZBDbuLb/nRcJ8TtNTm/J1F8
8sBRx6unEjMz9xO9u9HGTN3Pw7R2DM7Wo3U3mXW1I1kqOwEi5X2pqkv3Pcr5hvPOMx+KeL5P9X6tTsO1WlqptfY9eORK4+8ngbbhPqcPjY5Z6Q8tPPHmZhpxSr6hRyUcxu4yzzvE0ZVG2DKWf8D8TmaklfQ/XP7oKhfHcKk3D0sfy4exyw9csAyiNrp3rEt1rJA3HlTjY9BwAdKySJAvQ3XdlRzKULVs6pRoCQE+9v/ZRzHK5ijDGHPJN0nTQIJ0FYzuNlfXjzxeQFFn5LnaW5g1h+Pu5BLLiXUbuLn4ygCAhKn7/jfKw6YtXdPPyJdbsNjvyRMonUJ7vw5qyf+wiVsgsvQPLmHuwvs3/5Pzv7crFT8P+GLz6pffAH8vB3thfT1/tjf0mS8b/gM6fFUj7zLCO2wOsNqrVPRhwV8lGpwpT0Iq2+zMkx2JYl8uGfw2/ec4f7jG61Xx7tuKe+xPfVTrFFsFv2lfTRZnIRYeGa6Ri/yF4cFmEAFhX3aiPTcz/zBTCM0oWvjPLNGyLn7HEPYZ4ytVjVvkfaEyZ7uFqMd85Ym5bcYifXnYG/TV3vkFhHYkkYd3w3bLRPy/g/i8+VkklYc+qCeGPWR4JWFx8dq6bNq7ztTKm+yc8e0dKWCU2m/ms+ZB6nHLW6LgkHpTd7GZ2B/Xl/d6nJIQtPUDWlk4RTwJTsh5d21m82o5VFu4ROvzLRQ8tsTP8lDf8pKZTmmIHdRvZsU7a3ZRrWAqp+aIG6Lq48hw9HzKbX2fBIc+aZUNB/xvC4z5UfqbMOFrYCA5Ze4c1NLo8VGhE7AeWSCqLN6R9Sx1UWgLvbH7/6GeOaA+Q9G6Jh6ZZFPgqF6GNRZ9MJnmzypkg5Jbn8yYtPn3yaRN6Q7oJd/NSvv8ob6l54DCM1kRZvKYZFcRaHZ/uVHT6uUEpkmxf9oD8gVUOBj0/FYDRsQFJbnJWpgeJT0CFk6rfRoBjYjFMJgIUx/o4+f6jX8dYM8pSNWMRfhh2BDlCWSIlPYvDCkAGY1lkmE7kPMbkXXUXpMTDXdX+ImAQ6q3K5OWdnfnoExJ+EJ3cy6H7XEF51z8ZRnvHMrU6xgJG9+oUS3IvILBsK5+v6A+sO+95jo0bWvBq7gc2S0ThEyKQFyV1ZzOz4vTyS/1JU0MK13ccz5+DPaPDMnqY6y9fGV0H3I+zRntkLPYMAk30LB/7BHzzFZ2ms61ROe0MPUHzf8LfOOuspXDNvSFKNOI21wrjbbBThNf1kC9TYQ8RggD1b1CBBuaaHPs1+CZsYBu84wX+yG4XTTeUTA79GbWEjwOuKnFfkmgbdwF2DWkdIBcc57pqt1EMgRr0Dus7A7kZVVTXRaE1m4wlrn8LeI0QKDCqAFn30DRbN5jSbbI5kI+WL17Kuo6y0jaDYEXV6VuOkhmSPB5z71sJ0DmVQp5fadqdzR5dP1IqGtxgHHjBXWRLzp+7x4FZ4dUCsjfR6gdg8nxyYRdzj8Gx1g7Z+oUVDPnhKgb93W5xm5ojgpnBrhcCz39PPMwE/yvhs3XaOl5k2YPltfumWyHMeq3bF9PxxHSSMxqifqpF8yWMWyhTFhIrMxdMOpMBHQG2pRbPPa8X4H+9LBDPH98mzMv0fwJhx+P9MfFDUjU2YJBO3cy2zlf/LttTjUj6l16ufOXK7BbnBCrJcNRnHeAW8VQndAKwqUjDQ7FC0UeQaCHkHoMFUlNKFlWYbTr2zqjb9M0PadFZwiFBVtWr1R9yzv9ruL
```

3b3Ms/rSUchhZqPJa4KPNemsfrk2AH0z2myQtPha7AGuI84FTaunic+jVVJ0JHBkRtwNXkM08JC0aHks2YduSrJ3ahhyl7Rqyn
wlkjdYhZCb4g61l3wWcWGu3IiJWjIj9+jJIbSuSGbQ7ASLiWLIGq/Fh4NSIWDciVgPuHoK7lPJLss/PGyNilYhYohbq7D7ZD4y
IpSNiC7J/xzpkP6Pmdx0bOYT1smSG/du1CdhUDd0WEbF5RDyifsc/yNqFZljqXwPzYviACe8GnhM5+ENEDi4xoSN/KeVmskbv0
ojYMyKWr03bHto/b58rgM0i4vDIQUgOIY+Fz0Q+X+gxNRP7T7Im5D+QfcMiogmG/0Du11FDbb8kIlaIiAeQfZfafaTeCxxD9i9
7/4Blqd/5kojYPiKWiYjlgFPJGoumv9OvyT5SjR8AD6j7dznyXgTc3R/v48CZNV1bMqRvUJ33w2T/r5Xr9n/2iLR+Adi2fucol
wAvjhw4Zk3gpQPW+bL6e3cD9gc+0r+Sei48NSJWr8fIDsBJwJfqLFeR++YZkX0CT67TvzwoURHx2ojYqh4PKwNPA24ppfyOPHf
vYv7tfD3wsMjuAKuSTW0BqM1Zr239jl3pNT+dTynlF8A3gNdExHKRg8Q8hWwWSkQcGiRFr1UKfP9bFmmNuB7Jf47DaMUmLocU+w
IqIlcgb+Uci4nryRt80VzmMbPO/HrAv8L4RmQlJC9eTgPeUfB7Nr5o/4FzgiIhYqpTybbKU+r5kvyMASg6ocHyd9w9kJ/Njhn1
RKeUmsu/KN8nM8AOBr7dmeRcZRN0AfJ/M/P+bXibqaLKp1k31+z5KX7O4PodEdvr/I3AZ2YzuIaWUpvbkS2Q/k4+RJe0bM/U+X
c1vG7UtliX7k/2W7Cd1b3L0QOhlmH8XEd8bsN6PAK8ig8G/kEN/D2sSdxI5KMWbyBYGt5ODChxCDg8+KN2/IzPup5Hb53nA/rX
mYok6/Y66vt3JkQoh+9V8u27fy4BTSyk/G5IugKvJbfIl4A2llM+30vB1MtP+vUmC20L23/ptTdOewH61aSdkAHVxZBPNg0spP
wFeDnyR7OvX30/sZLKJ56/IZu/vGfdp5DnwK11PR8kBzWZmMh8LtOXgQNHrA/glWTwcQPwQ+B7dVrjV+SxdAcZZJxYSvnxkHU
9jmxK+hcySHtr/aOU8lx4MvDYOn2QFchmwH8kf++G1Ec3lFL+lzwev+1zev16386061llC+QAfMN5GAWn+lb3+HAjuQxdAYZU
A9zGDCv/uZPAGfU9UN2S7ixHnNnkyNmNiM1HgGcN2K9khZDUcpkrUDmnsiO4J8ppWwVEasAN5dSJmR2IuJGYO9aOkVE3ArsVLK
TuiQNFDmAwXmlFIdeXsY2/2KFMIwMQEQ8H3l8LJjVC5CMjrgYeXCYZGl/S4mWxr62p7eF/FjmkcPMAy
2a41P8GHlmnbwEsR20iJEmN2qxt39o0aV2ytPsTky2nuS1yhLptmb/Z4JxWSrmplLL9dIIrTU0dhXELgyvpnmexC7Ai4hKymc/
mkUMBP4Wson9K5MMBPg6TXPOI04Pg6/RLgGG86kgYIcuSzP5BNBP+L7JeixVREXEw24Xtm3+hxkiSNtFg2EZQkSZKk2bDY1WBJk
iRJ0mxZarYT0KU111yzzJs3Js3b7aTIUmSJGkxd9111/22lLLWRJvzWgZ3GpRV05IkSdbZLyLVrTM0CAUVaVtHAhvUb6UJbDOCAbKTF1
SJEnqiAGWJEmSJHOmKAJUmSJEkdMcCSJEmSJEkdMcCSJEmSpI4YYEmSJElSR0ynQSVm4OjaTbbGNKjIRsFTydbN6aDZVzoWWQAJUlaOLKXLS
SJEnqiAGWJEmSJHXEAEuSJEmSOmKAJUmSJEkdMcCSJEmSpI4sNVMrjogLgf2BfDrCr/2pH1TvQ6hWRlXEbN9b8ftz2PPW7eq0E6pfn5RsJEmZ2+AZJSTIo0
HX7AJUzRDBbB3MO2Ov4KKKeRGYoKTRX2sr+HJUKeqXS1KEM1iXmHyqvdrRlfTzCH3CLYNaDdmxa7hNOBwCuHNaBq1JEXBjH3YOWm1JE
SJEnqiAGWJEmSJHXEAEuSJEmSOmKAJUmSJEkdMcCSJEmSpI4YYEmSJElSR0ynQSVm4OjaTbbGNKjIRsFTydbN6aDZVzoWWQAJUlaOLKXLS

rXnL6U8ZuaSJUmSJElzzzh9sD4JXAB8GrhrRlMjSZIkSXPYOAHWP0op58x4SiRJkiRpjhsnwDo7Is4APg/8s5lYSvnejKVKkiR
JkuagcQKsBwJHAY+g10Sw1PeSJEmSpGqcAOtxwP1KKf+a6cRIkiRJ0lw2znOwfgCsNsPpkCRJkqQ5b5warLWBH0fEd5m/D5bDt
EuSJElSyzgB1hkzngpJkiRJWgxMGmCVUq6OiLWB7euk75RSZkSfjOzyZIkSZKkuWfSPlgRcTDwHeCJwMHAtyPioJlOmCRJkiTNNeM
0EXwRsH1TaxURawfBD46kwlbHMw7/fKRn9921n4LKSWSJEmSFoZxRhFcoq9J4O/GXE6SJEmS7lHGqikSFmqkvvj8EuGLmk
qSGNWCSJEnS3DLOIBfPjYjHA7sCAZf5sCAZxfSvnEjKdMkiRJkuaYSQOsiFgN+WAVZg/WTUsfZjpRWnDWfkmSJEkL39AKyKWAc4HHGv
cSva72jAiPgGcWEr510JJoSRJkiTNEaMGq3gxsDWfill21LKNsAGZFD2koWQNkmSJEmaU0YFWI8Hji+l/KWZUF8/KWZUF8/HXjcTCdMk
iRJkuaaUQHWXaWU/+2fWEr5K1BmLkmSJEmSNDeNGuSiRMQaZN+rfnfPQHokSZIkaU4bFWCtBnyPwQGWNViSJEmS1GfCAKuUsv4sp
kOSJEmS5rxx7oMlSZIkSRqDAZYkSZIkdYQBliRJkiR1ZKwAKyJ2jYij6uO1I2KDmU2WJEmSJM09kwZYEXEG8HrgDXXS0sAnZzJRkiR
JkjRVjVZkHvSe5BbcgZ+i87wN7+bl9PFIHqoJTd0bFMcCP/ynzDTmvtXbW2/vGbgS5tNHjcTxedl3Xjq+Fd/BqD9Je5D39E2hLKVE
jVOR4vakJ1VaJNymqETnhEvGRfYcmsw1Z6zqLhmoXERXgn6/7SR3L5aGsZRiFlsLJQbc7ZhTg1npK+Vh6jq1Wx4BXl2Q2hSvB6Gm
ObhpGqRqkWX6gUTbQFMtMBRXSNxRIkiRKVcQwHqUYYWn+DNeEqYzsuHhNIbCK5jLgBXKgyXsgQHNOI4k2HCMkQKKkW2UWgmTTjK0
lPqDnZiWiyPkZRBKBdI6LSqcjtIu44XAdgkYpH7fMJBhn8Lmb66nGh51G4i4qSDoqaBw4xHKLf/PmQwAe3YnZp3UfHJsGI5qz8Ld9D
8XaBBDWw57LNlgQMpOFkOT/TlvKJw9eHOUs7EkqjdrX9hmlQyhGD3pOvBgr9k4Fv8tzxh/n9BPCVskl8Sie6QdJPiAa7rpJ4PbTdq1
e7knPW8TxXl6W/L4Vw6hhkZ9fnAWHS2kBCVWtPQWfs5LnkT/lKD1F/ac5a/GbUbIkh3gZ4ZsMVS6ZEm6kUmk0m/u6ioj+nqk6ekXsn
lIVvrG8oM+dJe1HPGzCVvXzj0+6D1wJKPXTnQrdOhUKhrF/QoqPKj2RmrWpPo0d1gCkWbn5QfGvBkN7o7Wkhf1yvvMS6/KF6FJNaCU
sUIX1tNDUefgqbGyk36jDsCLFBIJqV2xSS8rZhr8olaSM2ck3h3Q1b8nAFafBv7+xhHDjVr7w6OvWDPD5BaoE5WQJX7EWuJOOvz6iB
mXmsD0YsUWTu3hRGWVFyMXZAKqNT9JqTxRWmdaFRbfZ4kWj3fRdOHQTzGjVBkFAr5BRTkAk2a1JBfTQhSvQjKz4XZcKTw1yACCuQaf
z+bAqJNWAgOJF5m0ocIXRHwHqBNYQrEfNqCQb7IUdGrpPbWCzFJRDvRBdbuXzs6hqaGM9NuVcgQ2cnQ3xcvnuCxC6MwXq79P5SNgdm
FmgZ5YaF0S1okfDqBbnV8gxK0bAPqZJTnJxmJ8ef2GbIjrDEX9EgBrAlmxcQqVu9QVMJA4P+LV5xnLhn28RIdT2pKHjUvqzW0rEOj+
z4JQKmYl9t3o/FyGBP1Ef2E+dJHsC8ZOAXR7nWYSjBBUTkWp6cSPcqRnrZzvBkGIVt8jELgBcMHjXjT8/GRQsQ6ZrJy0Hgu3AXuQwt
s6PwHy8lO7uKcWCZQ07n0gMa2aZiCvi4x9mO9UoVWMIq/0fEDRZdj7ybmn+b5vtebGeqKPGp3fE8RoyO5RPf5cNfaZ/9a4XgQeLLYJ
wfyEHXtVi8BeH52EwnjOL+zSl9JxMlhrLmFHF8ajFpbb7Yk3dPq9cAUojnvVjaMZ9eGJj3wp/zgHR0MZJtGrqEK1ojCMUCPGzmMQM3
5PLsjXq3S6Etnfhy0yjpMGY/NVo9oekYIrcxJiEbZhKQtKkD8nvUdUDFzd49ZfSEa18Uot08B5KR8mmSCqIZCOByZG+MdZBUCLZt2d
xbAWqWU30fEbWRTxP8A/y6lbDfOd2rxYB8uSZIkzUUjA6yIWAL4cynlD8BXgfuNu+KIW4WYrIRyUzNPKeX1wOv
r/AcAzyql/L61SZIkaTaNbCJYSrmbRXRI0kiRlkKkbwwD/hf/eRnkFnbqh91zzBKcTVDQEY8E0BGuk5zc1WadBYAySWPSA7IZHJjyWa1

vjtcmwF7Yebj6+98bEZvOyBeUUubsH71REJep/w8DXk2WhMcU17U38CHgQfX9EmMutwHwQeBtwOOAdRbyNtibfG7YO4GX9m+bK
a7rQGDnBVh+N2D7qSzfP9+42701/1rkA6t/Dmy1MLd9/f7zgc8CW05zm0Xr9arACvX1kqOWAVYiH2Pw2DptBfIGt/sUvntP4Af
Aw+v7e01zG+wOnDvV4wbYGvgh8ADgEcAXgdWmsPy+wA1k5uirwBeAZy/sY2ABjp29ge8BTwROAv4C7DTNY2cP4MHAfaf4/TcD2
9X3q09l+Y62Qfs3HAI8bprLTvm6W3//D+t9Y8VB653C9684je/fC/gRsPeCbLt63Vh5qunvcB/uCWwFrDHN9G8JfL9ui7HXAex
H3vuuB14ArD+NtD8a+DGw+VS3Xb3+3AQ8cprb7dHAN4FH1/crtffjJMveq/7fHvgt8DNg6Tpt3LxL+/h9EPDgBTgGHkoWFMS43
99a9nHAjcCmU1xuf7Jg8bHA6tM59lrffwl5P33oFNaxBXAX8MbWtLF/e18aVpvGNt+TzHd+HngLsDMj8g0Dlt8LuBN4+6A0jbH
8vsC1wJOp+eYpLLsUsA/wKuA0Mkheabr7cDp/5PX/Onr5n7HOvSl9R9crXJh//RfUeoBdRy/DMOkOAB7Vev3KerFeetzlW8seA
5wBfHLcCwWwDfC01vupXpj2Br5RLxCPpmZyx10fvRvcUvX/u4CXTSctdZlnAFePe6L0XWDGzlgOWPZs4PfkTfoh0zyWphMcvQr
4ZN+05ab5/c8HriSDtW3rtIEXS3oFCheSwcn6wOvJkrjfABczIsNH3gSXr991YZ22PnmT233M9O5SL7A7kZn7G4F7t4+dYenvO
34/Xl+vRGaW3gs8szmHRyy7H/DtJr1kcLAnGXA9c9z9PZ393sUfMI/M3J/SmvZq4KRprOs04Jp6PJzHGBk+Mhg/H/hMa/t9nil
kMDreHs8hM5tb9E0feB3qO/9PBr5D3qTHymQAG5GZg93q++YauNo00v7UetwuOe7xRBYCvhU4uPle4P7AQU2aJlm+OX4PAK4iM
4jPG7R9Zni/PRn4KZk5PYNawDaF5Z9BFow8gcyg/xxYc4zl9iPv1ZsADwM+Sq+wadx9sA9wG5lJ3qx9HEy27ev16sP0gqNmf4w
b3Ny/fu8j6vuN63Z44BjffZ+a7r2BNYCvkIHeftPch6fWa9H/A1437m/oW8c21Gv5uPuA3n1iaeANrXNhnPN33Xq9eFj/9pnG8
fe1eg6fD3ymf50jlt0U+DLwS+Ddg37bmOs5kSzcfzFw6JjL7E0Gl0cAjyHv+e8mW4GMs/0eU8+flwGvqNthrSmkedd63u/UN30
Xav55jHWsCXwL+DWwZZ026fk3lflGLL8jcCuwT32/Qb2GbLMg653wPV2ubGH+1Z1zG/AmagRapz+PfIDxpCUawOHA7+oyK9dpb
ydLBcYqCWjPV9N0ej1hNxpj2a2Ae9PKVIx7YtYL2r+BJ7cOmF+RTcbe05pvnAvdDvX/UcCpU9gH/bVPy5PBzlZT/C1HAJczhRq
U9glWt+FzyKZyPwF2nGrap3H8LVsvSs1NYQ/gWeSN6pnA/cb9/nrcXEZesE8mSySbQoIl+5a7PzVTDryUDLDvIDPXB5MZ528Dz
xrx3cvV/1uQQdar6oXulDF/+73JYOANZEDzZrIk7GXAAxmzFJrMKFxBNhG6nSyF3qum5yUMybDW5W4HXjVgW+5dj6Wh279v/rX
7Ppvyed+aNu7xvmL9bWeRGZqm1vjCcc6/uv2Xb/3eK+rrN5M1YudSM26TrGdHMlP8bvJme8KY6Z/wOxfkfCIzyVe1ts2etIKFS
ZZ9bD1+HkSW4r6JLGyaLLhfnaz1X7VuzxeSBRQ/JoOGsWqkyPP+k9TAbNxjoM77YjIweyDwvrqeG+r/SQNt4FFkodL96rruIpv
6TLpPhpxXk6a979xZrR6/9yKvXS8nCylHFo70re8CWoEBGXT+iBFBFnmfuRT4Smva4+r+X2/M792GLNDZnGy58Sdg16nsQzJTu
2N93X+d3mTEcg+u2+uTZH5jHvAl4LljfGdznD2FzGA39+7dyNYIh9f3uwD3GWN9u9bjfsm6H68hr7/jboM9gOPJWsjPARtOdkz
V43ZvWnk08t55zRSOmzWB95PdXJbs/x7GyEvUZc+jZqqBdch792eaY2Gyc4Es3Fq9bvs31nNxtSn8jiPqNt+YvG+fNeY2v4VWQ
QywHPDsej6NrIkkCwdOple49EQy33bKqPOubx1HUa9R9ALlNwNfJ68Byw7bZq3XS9fj/71knnus/B+wCnBafX0QU8izttaxG1k
ZsxuwGZmPGiv/M6Xv6XqFC+OPLLVZnl7J/fvrBWpj8uL1GuAB7Z0/ZD1bkyWf36oH3HFkZH8mvZKlQTei3ahNuQYcNEuRN+u3M
EaVI3mTuoz5b4xLNgfgkGU2JgOK19Tf/UiyJOUVZAb8KmrJ9KiDnLzA3LdeHN5Lluj+hWyqcxBZyjvyNwAPJ4PKB9b3rwAumMK
+3JksOWj211J9nw+6QD+SDKSeQL2YkJn9h9RpP2XMktS6z99CNlFbs++zgZks8ubwrHqcNCVH3yEvUi8hg4ZnTrb96+vDgOcCr
2tNO4msidqpfxlgWzJDuBkZ5M2jl0FvSuGfBzxjyHfvQV4Id6nvtyQDko+Nub32J0tMmyYq9yZvzF8lL1jfrsfih4ATmCSTB2x
IlkZ/pDV9J/JmPeHYI2+CKwBHkyXIB/V9fh8yyNhljN9yUv2elwFP6vvsIQy5UTL/+bNXc+yOOmf7jp0vktepper58haymfHlY
6R5PTIj2zQl3Yw8T48jS8DvR15PLqeWrvctvyV5/WoCtG3ITMZX6AXe4waZO5MZxdWmslzfOlYhr+XXkIHS+cBFZIn8yMwGmTm
+Hjijvl+ZPP/eRNbsDAqCV6jbfTkyg/tWsmDqIrIU+6h6/AysSWD+c3ctMsD4H3pNy9vn6cigE9iu7vtfkcHebmRm7VhqS4JJl
j+AvIftT7Yc2AH4I/DKSZZr/4bNaWXEGb8EucnM/Rcwr3UsvYK8vmw76ntb58/baQUW9fi9jbyeDrr2b0Pe/7es33Nenf42Mji
+ox7Pr2NIawLy/nkarULQus3/RO+6OKzm9CFkc7ilgE8zf63hUq3fdTIDCnnJa91NZKZ2I/L+8R96hWZNZvWhwP0H/PY30DtPj
yJrnR5V3+9LlspfQGYY151kHzbf/21ggzrtPvVYOnvI9m9f+1YkC/k+Urf5XeS15y1k/mSzId97PHmOnQ2c3pr+vvb7IcuuWP/
ftx57D2t91uSb1mPwtW9QXu791FYc9f0uZJDwIeo1ckg6mv30Hnq1IL+o22C79jzDzkEyMDyVLOg6imxB0LSeGtrcFXgteb/Ys
P0dZK34h4DXj1h2XzKg7i9YfAK9IGvSAlIy79O+Z29L3tceQV5Tjxm1/cmmrU2t8UrkdeCC+n5nhhQQto6/5wH/V4+jCcEcw1v
/bNz8dvLefXU9jp7dN18nLTkWeAUL+68eIN8hb8bPrtNWBt5RD7rzyRveW0es49H0MgW714Py2Pr31XoAvmLIspuSJWxP6T8BW
zv/QWTgt8GA5QddtHaoJ/orWtN2qifSoPm3qCfj48kq4f6Sy9XJEr5BGdT2Cblq/b9MPdkPA/5cv/dDZNA1oVSBiTfod5PNC99
DlsZ+kyH9oZj/Ar0UWWL0XTKTu0xrvsMZUhJDXrzvrNvsy2Tp5RHAt+vnx9fPR97kySYi15AlLhfWtNy3frYrcCQDMhz1GHwlG
eAcTV6YdqVmVOp6Lxi0bN969iGD2veSgfLB9G4Sp5Ht6pcjL8btzMAmZAbi9UwMCo8kA+b7D/m+H5DH+fat6RvX4+l5jKj5Jc+
bm+iV+LVrb59NvaiSQdAJTK0/0DnA0fX1/uTFevW+efYnz/3VyZqHQ8lA4vF98100ZN8v13p9bN33G5BB1hepN3cy4/A8BvTra
R2/QQY015DH/Sv65juKViFMa/rTgT+QGaVdyXPgRbSaO47YRs2NYSnyBnUQvUDpjcAe9fWZZCbn3gOO2x/VY+4Drf24PRm0vZF
eZnlQZqR97pxIXmcvIAPddVufPYoxajHIgOK1ZKZ6I7JGr2kq8gSydi0GfX99vzJZmPUjeu3olycLnl5DXwEJefx/jqzh25MsH
HgMeQ63j433AgdM8vubTO46ZEb/rfQyDCuQ96K1R/z2fell5vsz0s+raVhq0O8nr53N61XIe2GTyXsb8E/ynJ4swDuFzEyeDby
r77P9GHL+1rR/jgwQP0Y2D162frYdWZu2Vt8y7d/xSDJAagKl39G7djyRzHQOunc+mhzM6v7NdiMzZv8FXFmn7UhmnL5EX20Wv
aZ9L66/edu+z48hg6yHNtt5wPFzHb3z5sFkgP+kvvmeXLfPKn3TdydrHnZsTVuJDCwuaU07tu6Xdfu22XPI4GFXamBB3vf+H7V
ZcN3+r6P2KRu2D1rTtiWvl3dvc7L53Wcn2Yf91+ao++KJ5DXuzP409C1/FHmduL7+/hPIa8pLBqWzddx9mt599lQysOsv3HgGm
R9cZsh3P7H+7UYW0r+fXteIx5IFNBOay9X9vS/1GtVa1xPIwpafkQHueUPSP2j7H0w2i/1K33n5bCbWim5V99dW5P3yLPqus2S
+6ZIh3783ef8/iF5hQP92eRNZ4Dso37cGvYLVLchCoa37fxdZA3pi37HRznc+gywE/wq9Jur3qfuy6VM5oQUYra4nZJ75s2SBS
vNbmv+7kXmj/nTtQ+bv7+6vSZ5L19T93lzDDidbEowsoBjnb4EWXth/9QD5Glmlv009MZZvfb5DPXj+h2w6Megg2Zleh8b16rR
j6TX1OpjMgNwF7Nu3bHNh3ZW8gN8dZA04GV7D6JKEJ5EXosfV9w+p6Tqzvr8XfVX8ZCZk1fp6L/LGtAd5cfomte9X6/3Q2qc6z
2frSfLi1vR2RmFUZvthZID3wNa0N5CZl79Ta1AYkkGilfkgL7ZvJTPMTYDxBFoXsjptzWZbk7VmbySDqYvIi8Jf6d14jgM27lu
+/f33I0usm2YhjyUzpaeSGa8HjDrByIBs4P4lS/ReNcmxfDzZFGHd+v4ZZEatHWStXv/vT9bYLVd/16vJDOJr69+9yRv1S8kLw
wMGfN+DyYtaf5v1R9T1bkzWvJ1BX8agde7dTl787lentS+au5DBzqpDfu/ADHvr7ylkRv1z5E3gQQO+/xp6GcnmZnpY3Y6Pr++
PJku11ulbfnMyM96cI08jb4qnkMHV46lBZv18ZKkYea15Vn29fT0GX13frw8cMWQ7bENe5F9JZkJ2ITPMLydvCo9kcKHK+mTm+
Rjy+D+JvF4cUJd/Nlmo8ML6++f1Lb8XWTOwIb2ag9f3/Z5XkdeDCc2smD8A2Zs8Bjeox96ZdR8019ND+79/yLbYmrypnsH8BQg
n12Ngq9a09rn7aPIm+KC6D48lM16718+XZ2LBQzOgwJPIc+hNg45PsoDiRwzI4LfmPY0Mqi8nr9vb1m3wZno18f33g/7+rhdQg
/K+4+op5L1riyHffUDdR2fRC7jfQh7PjyELurYcsmx7Gx5Ut8dqdfmf06pBJc+LjQcstx0ZPL66Ne3iur+aoHNg86D62bPI4KF
pebIJmWH8LpnRvpnBhUMHkOfNw+v7piZjk7rcu4Z955Dj7kXk/eqhfZ8dTd77d+ybvndN9171/Zpk64EDyEKnF5Hn2PHUgXsGf
O+zqc2ZaNV0kwU6F5PXkCPJPE772N+LvK4396ozyYLFpuXCkXW77de/v4b8/qeRAeZ7yQKC3cj77zPpFbCMGmTpJPJ8P4taKFa
nv5FamzzJ9x9JFmIvQRbunlD3xe/rtj9kwDJNcPAEeufQg2oa3k2e303Lhh8y/Pw5rW67U8hCrSfW4+Hr9TfdPGTf7UPeP99G1
lTt1UrDLWRerAlyv0MGDMPyPo+v3/9QMj96Xt2n9yUD5u8zMe+zT/1dnybPmweT15vXU5uJ1vnubg1D75oT5HX6K/RaZi1HXic
3Zf7A5XAy79ofQDcVGx8mC8OXJq9hb6DV751s/XQVrbwX8w/AszN5/Vitvr8G+HTf8hOa19bj5JlkPu3JwGV1+ivq/miC7qYlV
X/hyv7kObQTfTV0ZB76KvL6+eR6XAy8hk71b4FXsLD+yIDjLnoByQ5k58K3MbGD4caMaH9MZkbPIk+mJ5AX/VfTa3azPX0ZJPI
i9HXgMfX9rnWnPIVWhpQs0XtMPSAOo1fl2z7IDiYzzKeRGdYmU7ctedOeUE1ONgX6PlkztU6d9hTyojyvruurZAbrGvouErQyn
OTN9XqytO9R5IXlnPrZZcDx7RO0tVxzwu5IBrHvqMs+uzXPymSN0k+pmSZqJro1z0lkZvb11NK/emCfTWaWBtUa7Ul2gj6KLLV
dpu7Dl5Mn/5rkhXqbMY6lk8nmJDdSSz7r9MeQF+unD1jmMPJC3PTVW5Ys7dm9dUxtSd443jVgm/Vvy8eSx/OJ9f0q5EX33cATW
tutqTXaHFi7boOmpOVhZID1yrr8NvS1gW993/7A2X3T3kmeA88nz68tgI/TVzBBNgO9lsxMHFn3+U6tNC5JBgBXMbjWdL6STwa
XDi5PBr1705e5pXfuP7a+34TMkKxCrybrI3XbfYMBtadkIPl2snagqaVci2wm1uyjz9d1DCqYaYLeJep3f5GsBVqWrGl4SJ1+T

v9vJ0vaN2tNewl5nTiDzJTsVNfxRrL0eULTFPKG9lTyhtYEk8fQqm2p71/PgJtD/d1337jrNr20bpfmuvcgsnS/v/nI1uSNfxn
yOL+VvMY0fcnWIjMIX2WM0fzIa84a9fVW5Hn/MrJQY526L4c10TuJDIDeTN4Ij6vLHV/TNKFpKBMHFGhq8p5Pry3/xuQN/EYGZ
LBa6zqSrLkM8ob91jr9gXX/ncWIUWwZ0t+VzBweTAbHw2r/tyLPw+Pr77+WPJ/2Ie+DN1DvT4OuOa3pDyav4WuRme0ryfPoW7S
uh83x3nr9JLLk/JXk8fvI1mcfA741yfc+CvhCfX0uea5+qO6/Zchgr//YW4K8NvwK+HCdtn491h5S98MWZJB4Kb1rY//19qHUY
7i+vzd5/r2OvkFFyEzm5q33g64/19ALeB5EZhrPI+/HW/Wtr7m+vJXafHNA+jYn7x1/Z/4akr3qd7+gb/7n1P3W1LY1gfkKw7Z
/67j7NpmfeQuZD1ifzPO8hyz0XWrYOsh77NVkfuTj5DHYtCR6IpM36925HiuDgphD6/ZrXysHBQfLk9fd9cjj+MnkPfK9NW3Dr
h1rUWt3yGvwp/s+X4cBfZDI8+4meoW3R5O1pqvW9D2LVpM2RjcNbAbVOLWu80CyUO3lZOD36f70k/ffn9C7dlxGFnSsQZ73Z5B
5wCPJ69ew4PI8shZ1XfI69RkyOHkl848DsHLfcv0VGx9o5iPP4/PJgtEz6QtQ6Y3OvXJN46frPmp/31XA10cdN63z7s9kLfZar
eln1d/xLPL62R9ArUqeK/2Fy88jj/cgz4cb6vbrJLgqpcydAKtukP3Ii8jW5E3uZeTF4VvApZMsewpZynQBvSj3CfUAOYes3j1
7wHLtG8wJ5EXwwPq+CbIOIy9KVwAfas3f7idxJpmBfGT9zqad7hbkzf659f02DKg5qet/fz2QLiYzCQeTEXyTnteQbfD7g6v9y
NKHter7w2jVMJEl0Z8mMyIHMnqAgN3Iku7dWu+vZGIb1guArZu0t6YfTZ6s88jSkB/QCzBPIm94/U0r9qsH/760SsbrNjmTDPR
2GJbmAen/CL3M+U+ZPyDal4k3+fPJi9oxTdrqdz+VOjAAvSaWL+w/dpg/wHgIvQz+I4H/pZdBXrWus91G+NfkDWkv8oZ2DfPfg
HclA4ehTSvqfI8iL3RBZlrWIzPjDycvvMfW+ZbpW24vMiO0b32/NnkufZqJpbzvYGLNSfu3n0YGMT8kM7ert7fTGOf+98jMzJd
oDeJBXryPIS+OAzM39XXT/+wF5Lm4Cln6+DB6gyUMHUmpbrs31mPuceQ5dVDd90EGSif2LTOPzCD9kCz8WJE8z46tx8ILyEC9a
S446vuPJo/Db9E7559MZkoOGrQt635evX7XE8nr1wPqvr+NbF70CTJgvD+Da+6awXg2JTNwG9R90e4/sTZ5fZ3Qd6BvH6xMHq+
X0GtusjWZUTuPzGgOa9qzJnmNndc6f95LFkIsU7dF/8iyD6Y3oMB5dX9cU4+DvcmCopfUbX88fSPAMjEjfAqZSXkm2QKgydAvT
dYODmxWxej+ro8nA7zNGNLJnMwAX8D8QdnryEK/ZjuuOSjNA46h99X9uSyZqd6xtb4vM7gG82HksbcEGXCcQRbutDOW9x3y25v
/29Ttf3z9nnn1OPgqtUZgwPc2AdFGZMbqTeS9/+QBx+jrmFhzvSR5zP6WPA/fRV6n9iSvfc8k76EjR59l/uvPF4DntM+31m8cV
Xv3CPI8e0jrmGiWf1rdHu2WHXuRTRLPrOnfv299z2P+mtsJLQ8GpOE1tAazqfvxOnr9SUc1a12ZbMa3OnkefJa8X36DzButSl/
egfmP/4FdApi/BneZId/dHxxcQda6vowMjO5FBl6rjTh3mwK1C8nrYFPjeiRD+ou1jr2mYL/ZX5+m15po2da8SzD/NWu+VjvAR
fX1ccCX2r+fLLwaVLi2Bb3m3+uQFQufJs+/59Mr6J4QHJBBWFOYdWb97X+gNyjWruR5vf+Q3z6sYqOpRV+VzIM/i7yHbtJa9tH
12GpfI7Ylz/njaBUG1/05qFnwvVuvlyEL437GxAqQ48h89aDCxaaPeLvQ5AVki5wL6eWFd2SMlhdT+etsRQvrj7wp3sX8N/eVy
AvXwM555I3pcrKU51IyQ3EqvUECHkcGOXeXcraWfQLzDzbwhHowtGuyvkKWMAwM8uqOeyt5QfwwWYJ0NL2b8xZkW9JTByy7Ab0
me2vSG1azKc3+dv1NzcWiv2lM07Rq79a0fetB2i4FuJQRzzKgd6F8BVmK0JSiL002c7qa3k3nAWQG4n7kjeySekA3mYlV6V2gd
yczjM2yqw74/dfT1z+FLE19GJmxfSGZaRnZMbGeaBeRJ31Tkr8SeWEatu/eQx0AgvkvhCuSF5avM2B4YAY383o2eZy+A3hnnfZ
YsnnBE/u28yPrMXV4Xe70uu8vJoOJ9Vrr3ZmJ/W36by4PJgOCpnBhqdZ3nVn365J9v2H/uu37b+xrkOfPp5m/L9fAZlH19Z51P
69GZqgvA56/IOd+O73kzbU/MB/ULHFrskDlheT5fxiZQfgmtUCgb/52ZuQkMpPXBIaPJzOKhzFxcJYgz4t9yPP+C+Q5cQp5rH6
DDM5WIAssXsWIIf7J68V3yIz2eeTN5AmtdJ1H3+MRyMKSb5HXu2/Qq8H7KfDN1nbbhMx4bTJs+9V9/gkyiFqOzHTcyPzX4ZGjC
5LXnfXIQOK15LnV3PxfTd7s1hiy7FFkJvoD5PHfNBM6kd752X/MjxxQoM6zPfDBYelvzbcbef14OllA9DF6rRNeSOtZOIO2B6P
7u364pm3gKFpk4P4iMpMwX79Y8lj+IXksD9r+9229fljd5k0z2ZXo9b85rf6mJkh7AL2BFzYn7w9fbK1rYzIwPZdeBn9YxnIT8
jhv7nevpxdkvLIeexP6e9G7d7yEvH7dhzz/2ulYZtDr/mlkxvxH5DG8C73a6u+Spe8fY0DTxMmuP/X/PvQGmhgV3K5IXmtfx8R
mVd9n/mv6amQNU1Nr8vh6vOzXt84zyEGilu//7kFpIZuQndU37f0MeLTKkOWDvO9dQa+Z1xUMGJSo7xiYrEvAoAFpJgsOdiPvI
48ZlXbymn8v8tx7Bnlf3aJ+dix5/gw6/tqtfvqvrVfT6wu40ZBjr79J7sZ1319B5n2aYO24yY691npeRO3SUZc7jwz6X0JfkEi
vWd9Hyev+kuR53X8MncOIEfQYXLGxAXnufGDIMo8k7w9NYDiPXpPoR9PrdzeqMH+num/OIoPT5lx+IFkw2oxieAAZePYf/xvQa
3H0HnoDoi1N73mtO9W0TDri5nT+Ol/hwvgjL7w30zvBjyUzEIOaJ50PfKJv2pH1JD2yNW0T+prmkU3G7iJP6neQGd31yBK499E
r1d+F+fsxDbrR7UhmYp9F3kw/SFbzNhmFzfsPNvKC/K46/2PrtCeRF+TV68lyeU3jOwd856CmDRfV16+qB++OZObtuwwuQWgys
O1g7FlkxrvpFLs08z9keEUyGNybPMFPqb/9ndTmQWQJUnMz/zh9w7S3vvcB1Pa2rc/eUff/2+rJtSR54RlV+rYfeRJuUo+J59N
7uOTK9ff3t5ten4nPudqArEF5CVkD8pC6vpEPuSSbqHyxvn4fmXFo9v0TyJrJlehddLen1/xjC/Kidjp5sXlXPQ5G9RNp1t1u6
/8issR+a3oB+dFkcNGfuV6HLDhomiU0zcPWpZdJfAaZ6ZswoAF50T+79X5/4H2t95vV3zzpcOIDzv0f08uwTvrMDbJJ6JvIDNW
6ZCnaW+r2XJXMnA58dhvzn9ebkAHV++hlrh9LZtz6nweyNxlQbUNvZLjLyMKcPek1c4u6rYeO3ESWir6W3g1lBTJD/BV6gfmqf
cvsQWYkHlK/f1OyMOCd5LH/GcZ8MHfrmNySzJA/n17h1C8Z4+HOZAn9TeT5s0Tdlq8ng5WmefO8Ics+mrxebEAWLJ1JL1P/xLp
f+wPc3Rk+oMClrWnPIGvgR9U8LF33+/PIa9u3yHvBFmRm8XpGNCthAfq71u30+boP16uvn8v8Q1xPGNCgTl+X7Je5ct3mr69pf
TK943cvsqDu0/RaHOxQj5s1W+l7AhmcHEOv3/Fm9Vi494jf/jTy+nIxWYO+ek3TzWRtxvcZXOvZvne8su63DcnM7J3MH9gPGzG
sHaBtT2bSfknv0SarkU2zPkKO2jrpoDz0rj+r1ffH1HRO6JQ/yT65um73V9b1DWrW3GQOm2v5YxkcZE24djD/fexJZJ7lCLLm8
vvkNXFTsgDv+kHraC1/KnnPeU5N/4rktef+ZEHBBbQKdplal4BjBu0/ugsOnkUWar6dvN4+sh4PN5H3gGH95ZpmxW9ujpfWZ8v
UtK1PBolfYWLhXjs427P+/g3qdr+K3r39CPJeMPDaN8bx9DkG1L4xoFkfg4PAps/a0McKtNY3rGJjULPK86h9Ouvv/jatrhfkd
eeyehwMbJJK5o9/QbayeAt5nW8KiB9EXkPeTdZE9bc8WLseX6fVY+fF5HHfHyg/gby3jP2IoCntn5lY6cL4I0uNfkSWKH6VwRe
ofchq/aZ0qX8kky8MWfcS9C6gTyMz/28nb5TfJoOFW8gbx+H9y9b/D6XvoXF12ivIm8aF5MVjZ0Z3KF2nnoT/U9OyJ1na1pQAr
k1eMAaeIExsWnVa67MXkCWin2DEAw7rdvw8dbQdsgT7eWRQstGQ398Ed03ztw3IUtDH1RPzy/Taxb+//ySlV0uwRv3udqfJE8j
mNk+iNXriiPQvS5YcfY68wTT9Pp5Pr1P6oBN83eY3kjeNpekNI302mUG/D3mj7M9g35/WKFVk6fEryQv+3Rk6eu34h2Xwm+25e
d32zyOD40vJm+Ogm9OaZPOvpulQuwnDC8kL75X1GBx2c1+9bvcH1v19Jnkx/WpdbtX6dwJDgsu6jx5K3pA2IzNYW9AL7l7PmA8
2HnA83swkI1y2zt8vkrWp36cGfXV/XFD3x2SjPZ4DfL6+nlePgbfTy6Q+pG/+R9ftv1dr2n3Ia85ldR0rM+SZPQyoCSAz8h+nl
+Fdgszov4bBBUsvojajam3vDcig7xyyBPia/rTX+dqFKU8jM1dvIjPdW5DXjNPqcbEhfYPJDFjfA8jr5oZ901eq65mvaQfZKqD
pZ3p/MkN9Rus3vLoeS5+s+3TrAd/5bMYbUODrjBFo1nRcTl4/HliXf09NQ+f9Xeu0zaiZw9a0LckS8JcyehCipinzSmRG5eB6z
LyUzKzsTOuB4PSO5d3JDMt65DX8I61tf3jdV0fTa/4+tICDbIJ3A3n93IS89zWZrufW/TjhvsPEe8f6dX83hQmb1jQOHOm3zjM
oQFu/Lnsn8KK++Veb7BhozdsMOPA0BvR3HmP55clj/EyywKDd56g9aFd7kILm9WPJFg+Pm+Q7mvlPrGncpW7T3cgM94fI4/fqA
cdv+/rzYDKAeBJZuPfBekw9hwzKf8DEAYkWtEvAtIIDJgZ2u9FrhvcheoXLy5DX/10YXqjTtE55PplvuJgszF2tfv4O8h7wtQG
//+4uGWRh3p3AU+tnW5D5hU+Q+bgbGL+gq//e9gSyNU7/YGjDmvW9jV7LmfXIYG9kn9O+9U5asUHvmrIceZ94X03jyf2/gbyOr
jvoN7bWcwJ5jmxDFhL8jiwU2Zq8Fh/M4BEHlyCv72+h143jnWReeDfyuD6WEQMKdfE3IytdWH9kqfi/Bh0gZJX6NuRF8Dzyotj
OaK5QD65tBiz78HpwLEkGME8ib4ybk5nX7euBcztDRi+qJ9mt1JtCa/pDyVKRPcjA6O7mfZP81m3J6tnnkRH3VfRGeRrZh4WJT
RvaF8Cg7yZJZoybASruT32oHVmqdAa1JoLMIP9gWPrrNriR3s3+/fQuNM8lM4zfYeIFai8yI/jo+v6jZClafyn10+p+WqFv+qD
hsdesaf80eeHbil4Ge2kGZ3BWIy+CTS3OUvT6T+1Sv3s58iRvN8Vpbu7n0Hvo8tpkcHJta76nk5m2lQZ9/4D0bE5mkM6sv2XUQ
C4HkMFTE6i2j/37kRm+hzE8OAoy8/s58ji/iGySsCN5s9m/ztffLPCh1M7orX13ZV3f6fUYOI3eUK1jlfwOSN+B5MWyv837sn3
znUnecE6r23qZZn+TAcOEWk/yRrI/8w8Y8E16Tck2IoOOS5m//0CQx/xP6t++zD9C09pkxv/jDHlOW99veTxZyr8xWdDwmvp7d
iSvZ59kYp+T5gb1Dnojkga9pjgPJAtaHkRmvvr7LG1MBlNrk+fXl8mb2ZeAc+s829XvPnXUb2j935he5/KgVyK/Wv/1qL5/Bpk
BaGpKXkzWMGxb369CZtgewYChuOv/KQ8oUD9br27rVcljeXt6fb7Oodc0uqld6C8R7aS/K7VWiKy5vIoMrJrttlXdL8OWbfo+N
AWLx5GZ1MeQ17BX1X38MOY/3pYnm9E/izy+TiIDsQ9QB1kgS+wvBg4bcLxuVdPZ3Dt2ah0zS5MFXe+jV/s4qmBx4L2D3nG8BXm
OrTFg/04WoG1GXtNe2Vpm0utv33cMzXtM94/eSKfDCkubY/sQsqnkigN++wb0Rlhco+67Nchz/XP0CvaWrH/9Axq19+dOZIDaj
LC8fj12LqJXeLdq3/IL2iWgs+CAzGOdUb/7SnrXkx0Zr9/vm+txsxR5Hn+SDKg2I/M9P2dis7z5umSQ+cxX13mbvtVrkvfghzK

FR5m0vmNZ8jyd0Oe47/z5PoPHK2jyb3sxxZozRlRs9B07K5Hn/NvIQqJ2wcGxZCHRhMIZJt6/j6QXJN+HfIzCK8larZcPWH5Te
i2TgswHnUevIOs5ZKD1WSapWOjknJ7JlS+MPwZkpuv0F9PLEJ1KZoj2onfxWYHMPA8aUGIdWu2UycxGkxluahyCSUq96sF4A3X
YUXoXyKcB762vJ32oW2t965E3y7eRF6Fn0ZfBHLFsf9OqYZ1J719P3IPJUvbtgPfUz5rBES6iN8jFyOif3vCm55IZyxVbn63C4
LbfpwD/qBeGXemNoPhMelXEx5Cl4v0XuP3IUotmyNP288HuRd4gPkLvGSyDMtjtAPQ55M24PyN2EQNqz8hM9Q+pQ+i2pi9fj6F
zycD0JLJke6zSq9Z6tiQDlXEeBrgPeSGaL8gibzyTZgzIi+TO9VhoB2gXAEeNWO7HfcfMRfQG2DiQvOldMNmxM076+t7vRV40z
6DXP+l8MsP7QXoZ1JNp9a3qW8d7yJvx+8haqHfQG5b+WuD99fWmTGw6sj4ZiG1DBm9XkaWs7ZvLvcnMxwfJG+WwkTqPIW9k55I
35+3qOp9Lljp/hdG1zo9kYof6pcla2Y8y5CGa5Ln2ebLG7FDyPGkyR8vQGzVxKwb3WxjU72hZsia43Tzu2Prbluz/7fX1/er2b
zLrTbPkkYMRtJaf0oACdfqBdf99isw83EXezK8kg5EjaxrWHpLmrvq7rluPu0Pr+zeQAcZm9AKMgQ9Br5+1r59NIdUR5LHdBFl
vIQP25VrpPJa8NtxW/5pnxexAZpqbmoeDmBjY70MdlbWmdQ+ydvN2aga9zvduhjzCYMDv6L93NGmd0Px5wLLTDtCmcP0ZmPeY7
l89Zt9BFqIOLHhqHcOD7ptNs6jnNJ/X/fxO8rrYBBjPoQ533z6O+47l4+qxfgMZWDT3kPXqOi9kYsHItLsEDNh3UwoOyMCt6aP
8PDKoW4+JhZon0ZcPGfD9zTV4GeqozWSh+61kPvKj5PWsf7S//i4ZG1ODUXoD0kw5oBqQvqXJ83Vg0+C+/TGoWd+XGfEInzG+f
2ThAnl/fQd53V+WvNe9jSyMPqLux0GtZibcv+v088kCvlvpjX1wbyY+hmeN+nt/U/fzifRqss4kr/vtfvSTVmws8L6a6S+YzT+
yxPEp9fXpdUftQt5gLqFvePe+ZT9O64FxdYc+lSx93Ktv3lEdW/etF4tDWtMOJW80Q0vwRqxvaTLwOX+yE2zAskObVtXP51Efo
tz3u2+hjlJWp72DXonAOCVBj6oHflMqO/LGRJbwvJmsdfgUGWRtSmZ6ryab1lzLxAvc/mTJ0oGt3/MT5h/Zb/e6P97fn3aytLj
pVNvuPP1ScljWF9EbQa/99PeofyuQzSD27lvvW+oJvjaZWXljXde0hgNljH5Hffu8HWQ9ve7Pof23JlnfE+u2n/CMMXoXr53IZ
5q8s/XZ+8gga+mp/oYx07U3GXCfRN5o303e2DYnS3ubUTqPIdvfD2q3fh7z176tRWZK30avYOZ64IoBv/0h9ThZoS9NV5HByvJ
96+0vOW53cN+NvP40wcXT6jZv2u2vyiQjhjG8Q/3BNU2r9c2/Eb2AaE9y1LIfkBmJT7bmOxF42hj7o+l39K56zK1N1qpcWPfPh
PO3tex+ZObmlWSGbcM6/WQy2BwanIzx+ycMKFCn9/dZ25C81ryKbNZ8Ddlc6K+0nv3TWn6B+rsyf+Z2FfI4bteYvb4eE5v3zz8
gLc3189lkhqWpyTmKPC+eSGvEyrrv/4e8xm5CZgq/SV63lyYzKduTmeJnDfi+x5DnxYZ1Xc+lN/z9nuT154XktXPCtWOS/dh/7
1hu0DYbsuy0A7TZ+iNrls8jC4g3HDHfoBYXTWbyTXVbRz1m/0GvxvVgsua/v2l/u1Bxf/K+G/VY/BR5Ljb3kPsycbTMBeoSMOC
3jB0c1Hl/TNZ8n0JeM86tx96zyfPoTPLa9X3GaxIcZHDwSjJA+DG9c3sjRgeHTZeML9N7VuISZNO2GxnRV3wGjqexxyuY4nqHV
WwcWn9/+37WNBe8hiH9VZl4/34XvUFEdiDzpU2rmVGDQT2iHjenkHnkj5D38HfW1yeNWr7z7b+wvmghHUzHkQFNkxF5CPDS1uc
vIi9e3wLOb02fMPobeYP+DPNnzu9dT9hJO3X3pevRZMbgRWTp0XfHOclnaBsdyICmVfWzY+n1UVmibr8n1AP+G3X77kZmvHae4
vc2JZwDO0TXC9KDWt/9WnoPEPwMvQdMNs2D+jOozaAMdw+0Uf8/jCz5aNoAP5HM8AwqfX8cGXysVt8v25f+E8kLdXuI8Ka0q7l
5X8D8D/57Mtms4OsMeAzAQtrnTU3qs8lAcZtprOM+9J4TNPTYrd/xfrJA4zbmf2zBx4CPNPu4w9/Xf3Nfj7yg71LfP6CecxfV/
TDoAn8qeSO6+zlnrXV9mfmbE72i9Trq8bpnXfcxfet9NBnQHMHwm1JTwvvM+v655Dn6zNbxdULdnrtNYbusS5YGXk3vmXE30dd
nicHP2DuEzFDfTH1oNr3nzUwo2GF0v6MrazpWqcfHyYPWUZddhgwOjq7v30hmypsBdZ7KiJGnBvz+cQcUGNRnbcP6O44jmws3t
WLD0r5A/V3JDGhzzK5CNgN6O72Ha7+FIecuw6+fe5EFQs2ATE0LiHbT1Wb44w8C36nTHkMetwfV9S1BNlMf1OLjPOAPrfe7kOf
6A8lje726T181aNuPsR9H3jsmWXbaAdrC+Kvbas/W+zXIgPRy8ho66bHO4GZRb6fXHP/t9Rx4P5n36S+Y7O+zewbZFKtpGr8Be
X16MyNa7TDNLgEj1jdOn589ycKLXfu24XlkocSm9B5l8jKm3l9uc7JG5CVTWKa/S0aTp1yC7BYybyEfY5OOV7AA6+7PQ76QVt9
XeoUZy5A15oMeIj7o/n0xvcdHLEsW1j13CsfNf9XvXJ/s4nMl2X/rR/Q1S53Rbb8wd/QMH0TnkRnsD5AZqb3IGoUP0npmBlky9
KrW+3aTlv4OdjuR1cHtp9ZPq9SL7FR3Vj3JZ6xT3ZhpGTagwu5kJvHRZEnzJfWC+VqydOFq8qb92Gl+78Dgjl7V7n+TN/TtyRL
Wt9W0HErWWh0+Yt2DBmW4iqw1uZrMWF1INtcZOiRqvTi2a3zaGZH+WpvmONmXLCXblAwGn9eaZ+fW66sY0CF/Ie3z/eo2ntb3k
00c92PIUN51n65Sz8GmWVaQgd27Wu9nZjjUiTf3K+r2Pocsud+EzCSvNmDZh9d9dyUZaPU/qLDpE9g/EEv7GF6avLB/kZqpaH2
2J3212H2fr0CWGn+Y3ihbTyMzNI9vzXcMYwYXffttNzK4eCaDg6OlmPiMvUPJa9UzyGY6n6TvGWx9236yfkefYfyR1o5j/pH+X
kuekyNH6hzx+wcOKNB3/A7rs7YNmSkZqyk3U+zv2rfs08nCoCbIWo28Bn6tfRwMWG7c6+eBdf7mHGk3dXwj8Dfmv9cdUvf9EUz
ez/d9wPX19Vk1Ld8mC+PezDQGs+lb/8B7x5jLTjtAm+k/8tp0G5k/WLru6xPIgPmNZHO3TUcsP1mzqCbA2aoey8MG1mn67K5a3
7+KPOe3ru/nkQUwQ5/T19rWU+oSMMb6hvX5WZYsPLio9M6v9iBb1zNGbfsYaTi2bsuxm4QysUvGyIGUFsJxNhN9Btv3v9PIQqr
jyVYD7ZYcj2eSoJrR9++jyWv4lWTrrXG6xDR9oZtCg9XJCpJ5C3W7z+ZO73BHfwj4TH29DpmZeFl9vxG1c+WA5ZYgbx57Mngkk
qXIEoyr6DUvbHbYrJd+zcB2XIHMhF1PBpa71QPzwWSzg3awMd1268OCu6Zq9+VkKc8HyRKoI+vnx5AX+IEnGMMHZdiFzKA9ibx
JjDMUb9Osrt1v4nIGP6esaZbYNOXZpm6/Y/rmezxDhjRdmPt3Bte9av3/IeYPKpvA7tyF8Puam/tb67Z+Ipmpvo4sGBg02t4yZ
AB+eL12fI5eG/4mk709A5oTk83KziNryJrBT/asx8rT+uZ9BBNH0Vu99R1b1WU/RWa6ggz23kwdUGAGttcGjH7G3rfIphpNs84
JzRKZWr+jbfuWbWfwd6PVN6duw3afrZcxzQFRxtwWw/qs3ZdJ+mwMWNe4/V2b4O5e9J7xclS9njR9XA8gg9+RzYmZ/Pp5bD03m
5r9Zhjqt5A1ZdvXeV5BHdCiznc0mYldeUC67w5E6/sPkg9Ob0YKXJPeoCkTar6msY+mlDnvW3baAdoMHnPNdjyaLHH/GfM/OuY
RZNOmZzEig87oZlEfJYOucQbS2pdswbFq3bcvZP4Ri8cKEphil4Ax1jdqMLNNmmsFvbxZU2vyIuANHeyn+9dzYEq/g0m6ZMzC8
TYj9/+6f95LBvsPrNvqyHpNOZgsXJy0SwLD79/fI2u/xh6voLW+n0x1uU63zWzv9I528H5khrhp2nEIWVvRvD8MOLa+vvvJ62S
18dfJTMx76XUCndDxnMx0nUZmeqbcd2ou/fVfEMgS/m/Q95yoGfjeR5JNKdeoJ9bV1CFaycBqZLthhg/KcBFjdqxuLbMPedNbi
cyYfGzAPP3NEpcng9TDyBvV0+vF56lkpmlafa4W9b96IX1/3W8n1H24bv3ssfWcGVoK23Fampt7O/O+BIOf1XEkWXPVDNxyH7J
A5Qtk34XmWvFR4HV9yy5B1vDeRdY8fa/u5+YBmF+kbwTRvuWXrtetl5GFGm8k+2btTQZZTcb4dLJGYIHazA/4/hUZ/xl759XPh
43W1iw/qt/Rd2jdZJn/OTPPIjPAPyGbJ+1FZhpfyEJqzsHoPmtfYQrDeNflxspc1evDl+rfk+o2PJQc2vmlZJPMh435nZNdP1d
pzbs+WVvyfHp95Q4kg62XU0d5q/P293lZv/W6P8g6D/jhwthn09jH0w7QOk7HPmTJ/FvoNck9giwYbB6G2gRfuzFGnx06ahZFB
lk/pRdkvbIeQ8syhWbddFxryOCRgZvCqU3qMfxC5n9Q+Svax3HX3z/mcotcYN/BtmjfW1clC1Z+2pr2mHpsf4ysiRqrSWhddtD
9e0mmWTBdt//3p3LsdrqtZntndbjTm2i1GYb4uNZn25PNx9pDaV9CHaiA7INwIZnR2rDZqe3/reUGjr61OP7RG63mB/Q94G8Gv
7MZha8ZBWmBSq3JUpDrmELH6r5j6i7mH/ig3aR0ULPEL5Il3teStSFvJksTZ6XP3Qzto/5huLclS5jOrTfiZ9eL2nvIQHPGah5
G7LeRnYnJYOaD1P6UNc0H1dcPqvuuGSTgXa3lghzRbzMyI3spOQzv48l+Np+uN5ZvkANFHDgiDWuQteO/pdeHYhUyyPo4vYFkh
j7vaAG30zqM94y9oecO0+x3xPwZ/MvJG/LxZOb+DLIG6L+pfYcW0nEzVp+1KaxvZOaqnjefI2u9j6zH0Ytax/DzgEdO8TvHvn4
y/zDUR9Rj+Vqyj9wX6AX57Rqrlcn+OfP1Q2X+IOt9dd/NSqZmUf6r59gPyED2HOYfrfhJdd/tOc11d9Isqh5D/0Wv79O0agAmO
/6nuc5Vmf8e3BSCNUFWc/4cwZDBjGZhny8SgX1Hv6UpGHsTvQHktiTvG+9ozbcKmRdYdRrfMen9e65s/1nfYR3v/P727+2L/lP
pjcq1LvAres9iOBX4I1k1+UtaHSbvqX9kcLULGTAcsJC/u7nA36s1bart7scalGGM9dy/9bp/1MFRzRLfTG+o8GWn+/2L8h/zd
yzemqyNeQdZino/MgM5b5bSdvfNfcBnTc32rmTfhYeTTfS+Qa1pq++/w/wjiS5RL/7X0Xsm033J/kXPpTcC5T5k4PAdBoy22Hr
9FDIj+x4ywGjany9F1mxcPJ0b1DS21bZM8xl7dZ5p9Tuq58iH6+89iqwF/SY5atT5ZIZ/odb6MkaftSmub1iT6PvU/fvl1rSHk
QU2zbE1rZYSTHL9pBcw9Q9DfRt5D7yCvJ4NrHUmCyx/DZzUt5/b99vzmWJ/wcX9j6yV/Qu9B+MeTBZAnELvURBH1W2/+zS/o5N
mUWTLg+tYwMBo2PE/zXVtRNbK7dp3rLWDrMvrNex7dNjfyL+7t3X7AcyfJysmDqzXzNcAb+7oe4bev+fS36wnYAYOgD3JTPWq9
X3/sxqOIEfH25bMUH2OHCWsadL0dLKEadXZ/i2z/UcGWU0ThoVavc0Cln4xZFCGBUjPwBOd4c0S30NvwILFpWlA+6a2FBmcvKU
1bTuyFPG9THMY+I7TO+hZMS8km0M1z2Q5vKZ51XptOI/eACftPkRLkIHE16mPaSBrwVamF2S9hvn7KS7f993t7fcEsunhBmRm+
230hrXfrn7XjPWZG7Bdpv2Mvbr8WP2O6mfDMvg/IzPmHyIDzpEd6ufyXz3ejiIHgnhaa/q7qDWXC7j+kddPRg9DvT4TB3pp9ln
TsmM74A+MCLL8m7DNHwT8h95DaK+v59sbaQ2+RN5Lph2c0lGzqEHXz9n+IwuBLgV26pveDrI+wIiBrPxb4H3wZno134fX+1gzy
vT3gOd39D2L3PE35d8w2wmYoQNgH3JEpBX6pjfNgk6t73cg2xv3P1T4w3Tc58G/ae3HOXmCMeRZUXP5r2YIj6uvn0qOVrY2Oer
Z61rznVP/ZmS0wAX8DUuQtSR/rOf4DjWj+JL6m9Yn+700GZ0mMxkMfojkNcAj6vt1yVG33kxvNL12rcGu5DDnW5HNLL4EnFg/W

4ZsZnEeWev1fUY8A2cGt8+0n7FXlx+7UzejM/ibM0PNImfx2GsClIeSweRO9f2hZM33m8j+ajfRUQuKca6fjDEMdd9xvCq9IHp
78nl3Jw2a17+B23J7MjD9LfM/gPm1ZNPKrprSzcl754jf05w/+5KFErfVc6l9bA7s1uFf5/tgUMHYuWTz+GtYBJplLip/S7EYK
qVcGRE7l1L+t5kWEcuVUu6MiHcAH4uIW0opl0fE4cC5EXFyKeVcsjTpr6WUv8xW+pVKKX+d7TRMRUTchxk4HhySO7/N8tJ6kR
ELF9K+VNErBcRvySH835sKeXXEbEz8J2IWJosrHggOaDIL2czzf0iYs1Sym8inkAAzrkE12IIOb9cl+T3eSA0scU0r5D0DJu
8rvI+IA4BURcSt5nfhkKeXLEbFEKeV/IuJp5MhttJYjIvYma7feQgZqvyP7ph0SEd8opdwQEf9FPiNvf+DaUsrPZ3J7DFJK+T/
g/8iBSqaz/JURsQzwxYjYLiflNhgwbwH+GRHvI2/Kby2lfLJ+dvN0vn9RVkopEbEfmZE+F3h6RLymlHHJJRBRyxLP7ASeUUr4WE
Us2x98CfOek189Sys0R8Xxgw4hYoX3PbKcdICKeQxZKrBcRLyylXBURjwKurNeINwzb30qllO9GxMPIIceXbn30C7Ifb1ffM6f
unZOp588xZCHVsWS3jjPJPpPfrPP8p/1f3ar7IMjCsVvIQqFtyf6Yn4yIjYA/lVJ+P5vpXJQsMdsJmCmllBsAImKJiHgh8gbl
bqGbFt/SkRsUUr5Lvn8iKMi4lfkAfLkumzMUvI1N/2RDDIOLKX8aJbT0okmUxgRa5BNL/6bLMm6A6CU8mvyeXFLk8b4rFLSp
qUPWiiNizlPJPsl/hVWS/o2vIkR+PIwezeEddZu3+9ZRSLiebGF4PfKmU8saaEb4rIvYna8iPKqXc2fru3ckM9YlltItLKV8tp
dxYv/tS4PiIeGBJfy2lXFpKuWWmtsVMK6V8ih1mHo+sGRErDDjCZwlNfPxQnLY9b8/wZeHhHHl1I+RAbgPydHtVz
YmcRvks3mh4qIp5M1lIeSQ7F/ICIeV0r5Hjlq2EkRsbB6kgPcEhF7kI8heZcB6kgPIB/Hc1Mp5alks7T3R8YDI
mKxrCxY1NT71D/J2tZHAR9oFYz9zOBqfottgNVnS7LZ1tsjYgeyE+g1wMmMi/g1wMMiYtlSyrVkicj/SyrVkicj7SyknQQZmXuw0FaWUv5dSLp/LGeS
2GjS8muyI/zvgZ6WUHYGvRcQ3I2KtOutypit9I5wFZl5PTsijiNL37Yl0/118jkxH6jzUEo5pgaOE5RSPks+vPWvYi8v+vPWYi
FitlPKfWrL6UrLmu/+a8WCydubbzYSIOItRrk92ZT02ZT02RGxeVc/drZNo/R80gz+YuAPZCZ6bbIfIfye7kKIVnR8RTyEWwceFBG
rLcyElVJ+TNa4t1t8DAqUjiH75v9b9y+l/MF75nhqe6e5Gjb7nog4uB7B7b9y+l/MF75nhqwe6e5GjGl5IFM4tFoVwXhhx/NwFrRcSaAKWUM4E/k8elA
dZCdE8pGFtQsThfD1vNgpal1yyouYhtTfbTemEp5Td9yy1RSrlr4aZWWnREExDrkzf95tVnLcmQt1VKllD9ExKvKvJkYM+TTaJ3KX
/PFrURMSuZD+n95APnd6BHIjkx+3mUeOc/xGxD/nMpLeTHX1PrDVTzedRm1S8lawVf3FrucPIzu3vJzNXvwMuLaX8qtMfPIcMa
542V7X2/8bksOZ/KaX8MyIOIfu3vbw2OIIfu3vbw2OX0kcFnJpqarAJRS/jyLSZ9PbVr/j/r6PmRBxONLKX+MiKuAQg4m9HeDq6mLiC2B/5T
FsFnsdDXnTn19MNnv78/k4GNvJEcKvJ4srDgA0LOU8t+zk9p+Vo+iPpUJpTOi+iJPNXJkYJOI5s9nk4O1LA8cEMp5WkdZd+kDpZS2xUxAR9yMDohXJmqtLgec2tS7tm/sY69qf7Lf14HZ
w1TfPI8lt9/xSyvdqX7UopfwrIl5AbtvPNJlYLT7qPecCsjkoZNP0bcmmgl8mS94tWAcOlSdm5/k4UJvyOfD
3Yt2VdvZ+BVZm41E2prg1PJRwc8m+zzcys50MW69e+EuXLvWRwtbgVjXVucA6yNyQDqBPLEvIo8ST9QSvl6LY17HfCbUspps5Z
QaRFUm2g8m+wr8ACy39LXyAdhnkI2p/1sRCxVSn37KV06iJiJXJo9XOA20opJy7AukeYCJiRfIZWSsAHy2lfKdOPwx4BnB4K
eVn0/1+LZoi4oHoHksP9XkP0WTyIL+I4ma622AH5cSrly1hLZJyJWJZu6/o18FtOR5DXgFLJ/6eXkb9iBDK4OM3OrrtV7z0pkDf/
rSw76siH5CINPllLeHhFLks8N/MNsplUaBY0dsm1dE9QA5EHkrVUn6qdW4mIC4CrSynvnc30dv5CrSynvnc30dWkmz/+IWJd8qPAjy
Br0v5PD3D/WDOripWb8ViQf0no7Wcj3v2RzpueQz++U1inf1MfQ1BKOSciBkr42Bo2vTx9XN3Korg86DiDi
bvF5+pJTyt4h4CNlv8aBSyt9BSyt9nI53SVCz2g1yUUr5GjnK0PPBXYDPPBBXYDPg1IhYyeBKGq7KqbHbflkV8uBVcPZHsv/j12U3dgml3op7p8
7+U8j9kW/UXkf1xfgbsZ3C1oOXKW1oOarkMSVHVPWlvQfK3o/WzAs9sX3a5OK9X36YHOlwz4jYuqb/TLKAshnl0OBKnej
rc7V9ROxSa/5/QPbzfWAN8u9HPovQYdg1Jyz2NViNLpsFSfc0MfEZX454JbXU/nZPAD5bSrksIrYiRwd8cynl7XWeZwCzgWXRHKlWmuAeE2ANYs2VNJ6IWJ5
Lb1ZW73IGtX/4ccvOJZZF+rL5GjtL0eeHgp5bezlFwtxiLiLiFPL+8hPgPmSfxf3JoH5lYE3gqWXRHKlWmuAeE2ANYs2VNJ6IWJ5
s4nZzWUyGoZcWVGu0wJ2As8lgZNv6/1yy1P2LwGtKKefMXkoHawbXiHxI9tOBq4EDycKU35LNGncBvkv2hxk4mIs0VdF6mHZEb
EH2sXpcKeXOiHgm8DCy7+I/yb5/vy2L2DMWpVHuUQFWX2mdwZUkaYHU4YrfDZxVCvDCDv/yOH498YWKOUctVspbFfRGz
UDK4SEZsBF1MHXImIg8jaqgOBf5CDXby1tB6gLTD9x7D7pZTvRz777XXwaN9i8VGfA3o/wFzX+dkb1tlB6gLS2Z2tdvM+D7pZTvRz777Xzg1aWU6+s87wT+Vkp+5kp59qwlVFoAi30frLZ2QGVwJ
UmaqojYPCIOjYjj6Yj1m0lkk7qTAgog9QFygJhTgRtLKVE1+zrNppqZf8X1EnFEn3UYGtE0tExNKllI8C7yAH4/gJWftmcKVO1McXvJU
c/n/VOnlJcqTKnSPivnXa98gHdEtz0j2qBkuSpOmqQdIbyCH2P0KOFHgmsDlwFLAscHJtNrg78LtFb9iq0njw8lHmNxQSjkrI
t5L9r06s+QDkU8BNrL2QF2q58QFwBGllG+3pt+HLPB/KzkQ0L+BHcla1UXm/JGd8pc
qpTxj9lI4WG2WtTnwnVLKDyNiN7G7fPA+4CPkQ8T/gfwYHIERDO36kztW1VKKWe3pr0DjpJaP4YinBN2Ip9SFe
1QTQUmSFkQp5fPkABCHnTAcvHQjFJQpjNtMQJDnyvTIl2SZZEfcDj5zK53kwNdOFKoOtNqHrsx+fiCZvo+5PF
4AHn+7FlK+XIp5XyDK811S812AiRJmguaUfVAMHRMTWwHOB04BbgdT2Bd5dSfjqLyZ1Ln3NsoB5pZRrIqKQ2vV0p51
WykUYu3Vp/3TwKnR8S2pZSZTvkSNsfqmU8q+IOJ9JykPYAiRpDDW4hwYPAiRpDDW4ghwYYidyGPNnlIuAIIb5ZS/jFLyRvmweQogO0+L68
HnhwRLyqlnBcRbvBHRcSaPudKM+hb5BHRcSaPudKM+hb5EPqD42IpUop3wGIiMOAfcl3GIiMOAfch+jNJiwQBLkqQpKKKX8KX8JiJeD64KD64
KCZvg/ZTOsA4JKI+EUp4Kre4BSyt8i4l3U3AU4XRcT3yYdfdYx3h9aS3ZirFBfGi+eAio69Z1o4RsW1
9/0XghFLKN8iHu65a5ze40owrpdxYn3FF5za3DagMH1/nCZ3e2LQr1TEGbE9hnA3B7gE8lO0R+n7Su/tQ1FpJL6OfbxI5PwgRgAAKNSAtMqNwWaM1w96fOx8K1ipxdBuxKJ
w4kqVsGWJIkLcYiYl2yWdYjqJq3drMsaw4kqWMGWJIkLeYiYnlgW3Kkw/8BrlqURjuUpMWJAZYkSZ2kw/8BrlqUrjuUpMWJAZYkSZZYkiR
JktQRAyxJktxJkiRJkiRJkiRJ6ogvBT6ogBliRJkiRJkiRFxY0TcEBHXR8SOEfH4HMOxBLiRJkiRJ1HX6lpIdrHpk4VJijHTHAkiQtFiRRFxY0TcEBHXR8SOEfH4HMOxBLiRJkiRJ1HX6a/1/34j4aPepl
SQtrnwOliRpzouInYE9gWSfwzItYElgSvntFNf311LKSjOVAvqhE3QdwzSg+J3QZEEl1GHj4cJHpsGJxdwG5o4V9hHjNKmHVodD9u8rmNjNDoY9uB7w1xGa7
VXx8UERfV1xtFxDcj4rsR8uYjRHnB89F8p4DviFBWNHvtnqM9Q8MPzELsN/v7N3KDD2hEWBCSOkZNaMnEgCSJF9gIRfORzM/xWT0Kd3iIhqnHmXjCdIkOjhZjz1ioXXuvpz3Cav+AAAAAAElFTkSuQmCC
qGzgXeUUrYHfjVknpMASikPBA4DLo6I5TpKvyRpMWGAJUma80opwfUeApwA3Al8KCKOmcIqdgeEuqa/fN2SeXZvPSik/Bn4ObDa
d9EqSFl9LzXYCJEnqQinlP8BVwFUR8R8RzCUmKJEl0Em0Xn6GE7NQg1JuRRGTFo73ur32arFNyTD91kqR7CmuwJElzXkRsHhHHhGbtiQGzt09zNQQ1ZYw/QVYuTX91xGxRUQsA
TyuNf3rwKH19RFDvuarzWcRsAKnpRGAXDzgqdekrQ4McCSJN1Si7L7RN0U0ETCcAWJ4JnAucDVzaDXACnA58Bvgz8rX8qcBJEfdFYNU
h3/F2YMla0/Yh4JhkoKhoO0y5JkiRJHbEGS5IkdYLlu5IhYZy2OJkiRJHbFbGSUxI6kSzRkSZIkdSR
QMsSZIkSerI/wdoV2jDffnS6wAAAABJRU5ErkJggg==",
       "text/plain": [
        "<Figure size 864x576 with 1 Axes>"
       ]
      },
      "metadata": {
       "needs_background": "light"
      },
      "output_type": "display_data"
     },
     {
      "data": {
       "image/png":
"iVBORw0KGgoAAAANSUhEUgAAA1gAAAI4CAYAAAB3HEhGAAAAOXRFWHRTb2Z0d2FyZQBNYXRwbG90bGliIHZlcnNpb24zLjMuM
SwgaHR0cHM6Ly9tYXRwbG90bGliLm9yZy/d3fzzAAAACXBIWXMAAAsTAAALEwEAmpwYAABtaklEQVR4nO3dd5g0Rbmw8fuBl5y
zkkEyKEEQlCgqkhRUchAQRJEk6lFU/MQcUBAxggoIiCCBwUDBsyiIJgwHg/mgFk5Zur746lh+p13ZnZ2t+fdXbh/17XXTuru6
lRdT1V1dZRSkCRJkiRN3yIzQBJkiRJuq8wwJIkSZZKKlhhgSZIkSVJLDAkSZIkSVJqJAZYk3cdExEc

i4piZTsfCEhHHRsTnZzodo4iISyLi5fX1rhHxvWnM62kR8YbWEncfERF3RsSj6+sXRMQ7pjm/0yLi1e2kTtL9gQGWpFktIm6Ki
D9ExBIznZbpioizI+JfEfHXxt9z215OKWWfUsqlbc8XICKWi4hzayH27oj4SURcExEPG8fyFraI2DIiPl6PuT9GxK0RsW/9bo+
I+FlbyyqlfK6UsukU07k4cBZwTg3UOsfT3RFReo6xddtIb0R8OiLuiog/R8TXI+KAnu+PiIgf1zR8MCJWnsIyzo6Iy9tIL0Ap5
ZWllBOmOZsLgaMiYvU20iTpvs8AS9KsFRHrA7sCBXj8GOY/zBjz4j9GDR5M0NcjgpMBxzDwBgGOY/r+15juCqUsqyjb/XTmbiGUpzZ9lLAJ8CHgzsDywPbA68F9h3wDQ
zlt4p+hBwI7AGsDpwGvDnGU1RfwcA3y2l/LwGasuWUpYFtqzfr9g4xn7S0jJPBx5YSlkeOBG4PCIeCBmYAm8Hjia33f8Bb2lpu
TOqlPJ34CPAk2c6LZLmBgMsSbPZk4EvAW4AfxXEahHxt04Nc0TsHxG31999MSIe0vjj4BnB3RMyLiDM
j4n8i4i8RcUdEPKHx+0Uj4vUR8duI+N+N+IOKW2EMyr368QEe+MiF9GxM8j4uURsehkVzQiHh8R365pvikiNp8gzTvVdftjbU3Yo
/H7myLihBHTf1NEvCwivlDX/+MRseqAZB4NrA0cWEr5n9VinlP6WUu0sp15RSzm4sv0TEyRHxA+AH9bOnRsQPI+L3EXFdRKxZP4+
IOC8ifhMRf4qIb3T2bUTsW/fX+e8LpZTPR8QyCqwAXBRKeWf9e8LpZTPR8QyZCF7zUbL0
JrR6PJX5zFfK1dEbBsRX6vrcBWw5JDfbl73xx/rsTCsUmEf4DNDvu/Mc826x/9TG9+dHdn6eFVN39ciYutB8yqlfKOU8u/
OW2AxYJ36/kjgQ6WU/q8gq8CHhiRCw3IF3Pq/v0LxHxvYh4VETsDbwAOLRu36/X7b5b5a+R7ssb74+ObDn7XUS8sGc5vb8dd
p4tkKbGrG4C9hu0bSSpyQBL0mz2ZOCK+vfhiWRrfl8DgE+rv6Y9GaGhA6bkp4CKPmJBCASEB3SuHqEHL8+L
2AvASGjXzwFPJwuw2wHbAgT1pvBT4N7N7ARsCB7zOQKBmhidM
wDHkS02i9f59fNo4GOllLtHHWK0DgR2BLSJiT+BV5H56FwLxcCclEHq6JBgxRJcn6AGkm2Qj2uBJvH7WycFwrRbXMSGyLJakQKAeEDFwLW
RXdSuAzZoFqSBo4DL+szjd8APyf1/YESs0fmirvMirvM+wC8aLUO/GLYB6v77YF3WysD7bD6TmzSo8N+O1iZOvZx6wCpwRUQM6kL4YGCU+
7euBH4GrAkcB1LyyJ3A4A4oKZrWgat04cj4u/AzCcUhmbLSIlurUXxcezW8N9J9gnuV9757EpcqAqwQQ923jwXuLKV8V8FHgl3Vb
egcFeY15bAG8lg/81yXN/HXieDUpTY/LvABOmR5rRF+u25kn/Dbaq1n3y4qkuaeiNgFwEH
VG/fg/zB1hH1M8gA4q3l1Juri0slwL/AHZq/P6Nppez+P7sbWLrx/JKVeRrS6de4oOAc4vpfyslPIH
gmbUl5zfAecBhQ1btkFp73vlbkwwqri+l3FhAemOp4BED0nwUcEMp5gN6SpAtkXkEd95/UPzRYz8mfqv7WQgQ1I6NhCQ/vnJQ+3aw0IKBsuvRjaCrtgKnYpmgzZSqXGn5+vGJKz0LeKl72BE/CXVHdLuNsk4lcYjt9jl/dJGj2nC
d+mrsOfY8HBGl5VSvl9neeRwLtKKV+rAfLzgY22LoFvQ8aAIWnGR0vVIAnLYQ/0yX0yqatGq40jlbA+rWcVbB/EvQ1P1mW
+dXlX1W3W6cq2PvDh3hmUUgrwSLJg/XrglxHxbdMFxoaHq3j8sdMGhKfAspzYIWdCL+2WxPZ93DpPa3ajzhtF0SAkGXaHyrcOSm9Wx56ilkr7ZNbDRz6Fn0XZLmPekXrIXJwd7DJcKbdXpEGyFg8OLmuk82e9sN4ArSnHjt+6zL5acs4Bxdm2uvSNN0asTNyDEHX4uskTpzWukaj4ncqCrLHBHyN0DxrbNuq59QNu6vbmpiIWMRKrQIs8WSfGGRYwFm3R33oKAT2ZHq9xgT9sGT9DLnNUvGwXHKG9YPBNMCU
6X8vZRyO/AOMhjpuLW2QP4LOJdsYdtpgZlVpZT9VpZT9yf21Lxls31O/Whb4U8/P/1R/2+s/wBLkvl2slHJnDcim4iDgw7Xl7B9ky9k
9A3477DybKE1/IStgJGlCsy7AIrsC7T3ib88iC1/bkgWa+0R/b0lAdgn8eCnlt/X9e+pnkC0ZS0XEjhGxkQfKB+tx7w7GYQQ
3ZjWrMx7582FxQRT45ul8I/kq0lnW5ya/b8vvl6PbIA/cvGtG8nWyAGubqUsmLj7xd1GT/u/KAWWn8KrDVkuQf3rOMuZOtQr2H
p7/hV4/X/kYXlfn7XXEYp5fZSyorAE8nCaVNzOb3r99c6r7VqIPEm4M3AryPiwohYvPiWwqnhfAzt7wSWnd89vfupLrvT2jVQDRY
88vBY6IiCCDi6trYXXwBNRA9pZTyIHI73w28e8hyh1lzQLoG/fanjYCl89u1Bvz+D/QPXnrn+ftSSjVQDRY
/QrYqd7ox/pW8J69pefoEgaWUH5KtSGDv4mI99aKhqmY7/iuLY2/G/LbvufZCGlajgUDSEnqa9YFWKWUzwK/b34WQ+KiI9Gj
ub0uYjYrPNzuhn6CsDQ7hqS5oaIWIpsedk9IIn4VEb8CCzC2oC2joitaDn4VFFWpwY3HoarJ2/wiyBrtTkPsp8IqeIGbpUsqVjUWUxrLWAy4iuwe
tUgOGbwFRf/JL5u9ytE7j9U/J1rFVG8tavpSyJZPzC7Iw30lT1OX8vF+a63Iv61nHZUop/VqnhqV/sj4J7BV5P9P9JEmuntXb9ly
K5cPwcopbyxlPJQspvZtutY926WjH3L+Wyd4ZKymQAK4w7F6Dtq2nMhS8+ZRZa2uyzyb4cSrSbJEnLK7OgQfFQdGZlOEMuhzj7hdBkfdFe9xgvTgLOAmG+YPFC
N178ckK5+fgGsExGL9Pz25wN+/w36dL/rM8+Ve+6D6p3nvcdDXfbajH4tnQc8ql7+No0udBGxIR10f7/fhKWU95RSq3UBXhN5
6s+P59oGzfXYWny2Opn6Hk2JE2Qg7l8HUkawawLsAa4EDi1XoCfQ7el6mxy6NSfkX2pT52Z5Elq2YFkl50tyNapbcgCzufojuT
1HrLLz5F0uwdCBktPr61bERHLRMR+MeBme2AZsjB1ZqD89ItaKiBWB1W5FaK9uyBb93FmcN5Kl5FNHdbcwCAKWj4hFaoXQ7pNc36uB/
SJv9F8MeDYZuH1xwO8vBx4XEY+nHMRiycgBE/rdezIw/VPwbrJA+4GI2CBcNGWBVS7LYzRcCNYwu6xjYoe6rxYjC9o+XcQVJEvCQiNqr7clXgKeRAKwC/BlaJiGZZXsduBfSNi5
/B/5T74s5MiJWqnBNWN25kwWHFUsmEnb/BPvFnCEvd0YN3wFq/zyszv+zrLqbcFEpqWRmQCjP4yWgO1+LKbQRvSQhJg6eMqhA/DMdL9l
Yh4ANkK0vEl8v680yIHJnki3a6nvW6u6arxuAocdZDRC/CLyqHiMPAY4nseGhEPDFy0JNnksfdl3vnFRG
bRcQ+EbFUTd9d9R5P9R5L1znYE2riCPyV1rAP1S4Nqe1rPOvDaNiD3rsfB34G909+2vgfV7As3bgcPqcrcnuwV2XAPsHxG7RN7z9lIGl
20GnmcTpAlyW39kwHwlaT6zPsCKiGXJ/tHvi4jbye43wOXlFLWJruRXNaTKUuam44h7wv6SSnlV50/soB8ZETEK6V0cqR
r0ij4lFJuIe/DehPZjeqHwHLWXRKuYO83+ZLZOHuwcAXGj+5iAyivgHcRhZs/0238PVkcmCIO+ryrqF/V72BSinfI+8RugD4
Vmwflwp5Z8Dfv9TcnCCF5CB4U/JVp9++d9E6Z9MOv9O3qN0BznIxp/Je512IFscB033SfLemPeTAdqD6N6ntnxN4x/I7lu/I++
NgezOd2dE/Bl4OvU+qgFuBjYmt98rgINKKc2uYpeRgfOw1qt/kvdnfaKu27fIAvixdT2+Sw6S8KPoo3j93GdmycSe5na9qrPc/y
e6Tx9b1O5QcoGUB9bePJ+/p+y1ZkfjkusX+PgRsNkLXusPrOv2C7Eb74nrPXsd/13T9gdzeT6wBba+gdp8jj7nTgUM798WVUr5
N7qMr6m+WA54xIE1LkPcC/pbsnro6eSxDDrgB8LuI6Nxz9yLymPkDOQjbNvRUqdbkn189+WX/T91llE5xnA9NUKxH2JbuaStKEY
v6u4bND5I3PHy6lbFX74n+vlLJAgSUivg3sXQsbRMSPgJ1K3K3mguSa2LiH2At5VS1pvwx7PQXE//VNVup78Btiul/GCm09OGiDg
R2KKU8swpTn82sFPEpZTn82sFEpZVjger8XEacC65RSwjAHNBvhuJkVz8b9Jg6Glcn64ckMH6rnqP7D2sE71W4rDa22qwnMc1FGHO4+98GHcq0b
y1yCPAPTDTdbDHX09+ik4Cv3leCK4BSyoVTDa40ulLKBQZXkiZj1gVYEXYEl2VVn04j4WUQcT95jcQAcVXwTXaNgew//dT6+ZX
AsWU2NslJmsuC7Jb0B7KL3XeA/zejKZqcuZ7+aYuIO8kubc+e4aRIku4HZHZmUXQUmSJEmaZQ1WwmtP18qFbolW6Udi4VpvhlmWMMsnZLZjknBodm0yBH8
/31ZzoZkiRJkjTUrbfe+VpVvmHyEh4WLUsImt4UEt8A1i+GcE1ku2t91OH8SgmUY8W8jQHhM7PA+HAuF23yCIjNGJknTJxJEgGKIPrH6BbH
SJElSSwyJEmSJKklBliSJEmS1BIDLEmSJElqiQGWJEmSJLXEAEuSJEmSWmKAJUmSJEktMcCSJEmSpJYYYEmSJElSSwywJEmSJKklBliSJEmS1BIDLEmSJElqiQGWJEmSJLXEAEuSJEmSWmKAJUmSJEktMcCSJEmSpJYYYEmSJElSSwyJ
KklBliSJEmS1BIDLEmSJElqiQGWJEmSJLXEAEuSJEmSWmKAJUmSJEktMcCSJEmSpJYYYEmSJElSSwywJEmSJKklBliSJEmS1BIDLEmSJElqiQGWJEmSJLXEAEuSJEmSWmKAJUmSJEktMcCSJEmSpJYYYEmSJElSSwywJEmSJKkl82Y6Acf+b
1Q7+/89X7LaSUSJIkSdLEbMGSJEmSpJYYYEmSJElSSwywJEmSJKklBliSJEmS1BIDLEmSJElqiQGWJEmSJLXEAEuSJEmSWmKAJUmSJEktMcCSJEmSpJYYYEmSJElSSwywJEmSJKklBliSJEmS1BIDLEmSJElqiQGWJEmSJLXEAEuSJEmSWmKAJ
UmSJEktMcCSJEmSpJYYYEmSJElSSwywJEmSJKklBliSJEmS1BIDLEmSJElqiQGWJEmSJLXEAEuSJEmSWmKAJUmSJEktMcCSJEmSpJYYYEmSJElSSwywJEmSJKklBliSJEmS1BIDLEmSJElqiQGWJEmSJLXEAEuSJEmSWmKAJUmSJEktMcCSJEm
SpJYYYEmSJElSSwywJEmSJKklBliSJEmS1BIDLEmSJElqiQGWJEmSJLXEAEuSJEmSWmKAJUmSJEktMcCSJEmSpJYYYEmSJElSSwywJEmSJKklBliSJEmS1BIDLEmSJElqiQGWJEmSJLXEAEuSJEmSWmKAJUmSJEktMcCSJEmSpJYYYEmSJElSS
wywJEmSJKklBliSJEmS1BIDLEmSJElqiQGWJEmSJLXEAEuSJEmSWmKAJUmSJEktMcCSJEmSpJYYYEmSJElSSwywJEmSJKklBliSJEmS1BIDLEmSJElqiQGWJEmSJLXEAEuSJEmSWjLWACsizoyoIayLiuxHxnYiJ0mKpmRZLkqRaBJkqRaBJkqRaBJ
Dti+lbAUsChw2ruVJkiRJ0kwbdxfBecBSETEPWBr4+ZiXJ0mSJEkzZmwBVinl58CbgJ8CvwD+VEr5bO/vIuKEiLglIm658847x5UcSZIkSRq7cXYRXAk4AHgQ8ABgmYh4au/vSikXllK2K6Vst9pqq40rOZIkSZI0duPsIrgX8KNSyp2llH8CHwQeNcblSZIkSdKMGmeA9VNgp4hYOiICeCzw3TEuT5IkSZJm1DjvwfoK8H7gVuCbdVkXjmt5kiRJkjTT5o1z5qWU04DTxrkMSZIkSZotxj1MuyRJkiTdbxhgSZIkSVJLDLAkSZIkqSUGWJIkSZLUEgMsSZIkSWqJAZYkSZIktcQAS5IkSZJaYoAlSZIkSS0xwJIkSZKklhhgSZIkSVJLDLAkSZIkqSUGWJIkSZLUEgMsSZIkSWqJAZYkSZIktcQAS5IkSZJaYoAlSZIkSS0xwJIkSZKklhhgSZIkSVJLDLAkSZIkqSUGWJIkSZLUEgMsSZIkSWqJAZYkSZIktcQAS5IkSZJaYoAlSZIkSS0xwJIkSZKklhhgSZIkSVJLDLAkSZIkqSUGWJIkSZLUEgMsSZIkSWqJAZYkSZIktcQAS5IkSZJaYoAlSZIkSS0xwJIkSZKklhhgSZIkSVJLDLAkSZIkqSUGWJIkSZLUEgMsSZIkSWqJAZYkSZIktcQAS5IkSZJaYoAlSZIkSS0xwJIkSZKklhhgSZIkSVJLDLAkSZIkqSUGWJIkSZLUEgMsSZIkSWqJAZYkSZIktcQAS5IkSZJaYoAlSZIkSS0xwJIkSZKklhhgSZIkSVJLDLAkSZIkqSUGWJIkSZLUEgMsSZIkSWqJAZYkSZIktcQAS5IkSZJaYoAlSZIkSS0xwJIkSZKklsyb6QQ0nfDb82c6CZIkSZI0abZgSZIkSVJLDLAkSZIkqSUGWJIkSZLUEgMsSZIkSWqJAZYkSZIktWRWjSIoSbr/OeGIZ830wkiRJ0oTYgiVJkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiRJklpigCVJkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiRJklpigCVJkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiRJklpigCVJkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiRJklpigCVJkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiRJklpigCVJkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiRJklpigCVJkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiRJklpigCVJkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiRJklpigCVJkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiRJklpigCVJkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiRJklpigCVJkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiRJklpigCVJkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiRJklpigCVJkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiRJklpigCVJkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJktSSsQZYEbFiRLw/Ir4XEd+NiEeOc3mSJEmSNJPmjXn+5wKfLqU8MSIWB5Ye8/IkSZIkacaMLcCKiOWBXYFjAEop/wD+Ma7lSZIkSdJMG2cL1oOAO4F3RcRDga8BJ5dS/tr8UUScAJxQ3/5vRHx/jGnSwrUq8NuZTsS0vfuCmU6BJElz2dwvDxz+9JlOwfj88Ha4+Z0zmoQ3X3rRD8Yw2/X6fRillDEsCyJiO+DLwKNLKV+JiHOBP5dSXjmWBWrWiYhbSinbzXQ6JEnSzLE8oPubcQ5ycQdwRynlK/X9+4Ftx7g8SZIkSZpRYwuwSim/An4WEZvUjx4LfGdcy5MkSZKkmTbuUQSfA1xRRxD8H+BpY16eZpcLZzoBkiRpxlke0P3K2O7BkiRJkqT7m7E+aFiSJEmS7k8MsCRJkiSpJQZYGklE/GWM8752jPM+PSJeMK75S5J0XxIRJSLe3Hj/gog4fRrz+8o483lpNjLA0qRExLgHRpEkSbPT34GDI2LVNmZWStmxjflIc4kBloaKiN0j4vqIuJqFhtmPiHdExC0R8e2IOKPx+zMj4jsR8Y2IeFP9bKOI+GJE3Fi/fk8p5RnAonWa5SPi9xGxa/3+poh4UO/vu2d/9PWfHvOz0vz+LqbEBcTEQeY/TzdWyvm6z6+PxbzfyQjxy7OVLkiRJQpGDDsK4JCL2qO+fGBFH1fePjYh31fcbRsQ1NXy4ISIOqp+PrcePNFvEKaeccdJ4iy0RCwLvpOjsqV+dCpbbGaLVefRAePjPsTm5QfMwq2dL2xrdI0jdjdb+VO0V5e+qB2/4p9+wxYD4YqS7r+5Ivzm/VxcEgGl3LdyvF8uWq3EZlGXQdpJcuMbRcjF67PrjxGMbLVn+dUTi3VjdWmTBj6+f6wnjaDO8jJ9HWaWpG/0mD8xUH5SLWm5w3WLMRftYtj8eh5tHZ7CkeRNyQD0ZSsjKu6kxTkdxvPHbjg5KeYHX1vKEvWhaRDz4YAGHyL1N3TWr4aGo4yjCNiLdFxMfbRU2cujdPb5TIyCVPIgjaQJIQ0iJNMkjHiLK/KOw6WW2MNUnC0sXEFlCbRaEkKbCW5LfImZ+IvIjWiUBXjMSlWEsKIpchDOvkCiAiTJjw1fBjM1I2x/rwLgySQlmKLlUlGIAmTRjGmaFtIZtfgUJgYdwdJIVCQpiKUOXRtRmFhCuqlqJFGMIWFEhQVGcRKoqAG3CWIzYVp4S6kJWEJMSMXgIIVqFpFJWk/IM4FpmAACYJIkFhsQITpK6oqDpBCEIpmkijPmwSQYcaGZKqlaBQTWGMRSVRKkNBJRCRzN2LxNEM6GQp6UzbRYkl2DPk5DaQqTfWGARHCbcREwwA8uRx4SB3rCVNERUdeVJzYbzBzGcqSJopBO6Igkx0GyEQxbikwHBiJXK0FBgFq1y7RZJkMiURsWYSQTkEQQEhoQAEBJEmQJNUKlZQzL0Y+kKQGCIogKkICwWZYSRLIl0q2CEWALLMqAITSBYlIURbCgAFMcqxRQ4jGKaEXFRmLJOjEJuSZCVuLuHBwhIByb6SCQlgsQKnYD/IDdPKDhXghQgEmWGUmMQhqqRQRIhEOwJgSwxhHgMRIvBkSZVLAJkYRwTYwgQJQLByhFSeJpBlD5IWSKlqSP7aGyVcNh6nlN6QkKoACUMqZRgWRMjBMGgJDIJIUZMDFDRgYEYMpDqIDQqpRMUWlFlGBSKgFSFKIUHJilMGExfMJAg/I8pBIZYGBxZRC4mDQmoHkWYCBYhGRqSOgCSBmNRBEwm0ZEqSuqLoRhkMkpHAkgvSQNkpxWlgRjSBYYUhZBEbUkGqSqxgIFBqWKDVcWCbICqsGkwxSKIwWkgZqCtBYwFERiE0IkkJYmQ+iqZGOgaLSRTEiSwoqAkWGQkiyQRiKXCGGBdQhAVgHmIAqyUYIzClVQahBEoRkgGhYGjFkBQKVFUKUiRUmUmKRBJFSxOgIRTyFrQmJJiJBUhLKEyQpKAiIEyJKFSWJdBBnRoxgM0mGsQgoxQqRUi0AjAlSihFFAQYCRIqJihQsBE0mRJCOUYETKSKSZBhFIiWgmhIbSJDISLgJtIwTIZUkYgSlAKRY4URqCWKFJUKLADBEhFBSoSIVgGUSBIVJmhkiFCm4CKMZYhEUCIUKAIUEgBEKYRZJqMgIggDJrjJOFJqQEmIqOBEEIkmSAWmCSPRUK5TCRYSgbhCE0MgTNIgQWhGJYgqkkUooQIZJCU5RhEFhJkSqIgYUxQNUFIDWOYJLIFYSBEZaWJUkZBQqQjW2SEIClwjiGCJHkSIKGaQIxsGUCRQgUUBKgYJKcWCqCIkYYQE

mNMjiRJkiSN1zgDrJ8BPyul3FzfX0MGXJIkSZJ0nzS2AKuU8ivgpxGxaf3oUcAd41qeJEmSJM20cY8ieCpwRR1B8EfAcWNeniR
JkiTNmLEGWKWU24Htx7kMSZIkSZotxvqgYUmSJEm6PzHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBl
iRJkiS1xABLkiRJklpigCVJkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1ZMIAKyJ
Oj4jlI70zIr4WEXstjMRJkiRJ0lwySgvWU0opfwb2AlYDjgNePdZUSZIkSdIcNEqAFfX/vsDFpZSvNz6TJEmSJFWjBFi3RsTHy
QDrYxGxHHDPeJMlSZIkSXPPvBF+czbzywDJYwDPjUsr/RcTKZDdBSZIkSVLDKC1YDwe+V0r5Y0QcBzWF/Gm8yZIkSZKkuWeUAOutwP9
FxNbAc4EfA+8ea6okSZIkaQ4aJcD6dymlAAA55dSzgeWG2+yJEmSJGnuGeUerL9ExPo4FdI2JRYLHxHkuSJEmS5p5RWrAOB
f5BPg/rV8BawDljTZUkSZIkzUETBlg1qLoCWCEi9gf+XkjgFjkiRJ6jFhgBURhwBfAQ4GDgFujoiDxp0wSZIkSZprRkH64X
ADqWU3wBExGrAJ4BrxpkwSZIkSZprRkHa5FOcFX9bsTpJEmSJOl+ZZQWrI9GxMeAK+v7Q4EbxpckckSZIkSZqbhgZYERHAG4Edg
F2AAC4spXxgIaRNkiRJkuaUoQFWKaVExAdLKQ8Frl1IaZIkSZKkOWmUe6m6+HBE7jD0lkiRJkjTHjXIP1iOBp0XEj4G7yW6CpZT
ykLGmTJIkSZLmmFECrH3GngpJkiRJug+YMMAqpfwYICLWAhatH/9inImLvLR+9CXgj8DiwKXAq8aeO
kmSJEmaQ4YNcnEw8PrG+9/V+662BPYba6okSZIkaQ4aOopgKeXuxtvz62f/AZYaZ6aIkSZIkaS4aFmAtGxGLdd6UUi4BiIglgOXLdd6UUi4BiIglgOX
HnC5JkiRJmnOGBVjXAG+PiKU7H0TEmSpIZhAdaLgN8AP4mIWyPiPiVuBO4Nf1O0mSJElSw8BRBOu9VmdGxGxEuAjerHP
yyl/G2hpEySJEmS5phRnoP1N+CbCyEtkiRJkjSnDR1FUJIkSZI0OgMsSZIkSWrJhF0EASJiLWC95EAsJiLWC95u9LKZ8dV6IkSZIkaS6aMMC
KiNcAhwJ3AP+pHxfAAEuSJEmSGkZpwToQ2LSU8o8xp0WSJEmS5rRR7sH6H1ebEbDYuBMiWiSZIkSXPdKC1Y/wfcHhGfBO5txqlnDa2V
EmSJEnSHDRKgHVd/ZMkSZIkDTHKg4YvXRgJkSRJkqSRJkqS5bpRRBL9JjhrY9CfgFuDlpZTfjSNhkiRJkjTXjNJF8CPk8CPzvqe8P8PA4I
Msi4BHjeWlEmSJEnSHDNKgLVzkWVzKWXnxvtvRsQXvbtvRsQXSik7R8RR40qYJEmSJM01owzTvmxE7Nh50TAF8
cC7ImJZsmvgn4ETImIZ4FXjTJwkSZIkzSWjjCL4VeVDBEbECEKWUPza+vnpcCZMkSZkKuWZggBURR5VSLo+IZ/V8DkAp5dwdxp02
SJEmS5pRhLVjL1P/LLYyESJIkSdJcNzDAKqW8vf5/ycJLjiRJkTNXROOIhgRm0TEJyPiW/X9QyLirPEnTZIkSZLmllGGab8Ie
D7wL4BSyjfIhw1LkiRJkhpGCbCWLqV8vCkyjZRBS7R90LqV8peczn38lSZIkST1GCbB+GxEPHKQpqYBZIkSZKkOWiUBw2fDFwIbBYRPwf+Fzh
yrKmSJEmSpDloaIAVEYsCJ5VSHh0h0RywCLlFL+snCSJkmSJElzy9AAq5Tyn4h4aH1998JJkiRJkiRJkiTNTaN0EbwtIq4D4D3gfcG2SVU
q4dW6okSZIkaQ4aJcBaGfgdsGfjsGjswIYYEmSJElSw4QBVinluIWEEmSJEma6yYcpj0i1o1ENnqvwAmSJEmSJEmJEmSJEmSpJQZYkiRJ
mklGeg3UxcB2wJrAW8KH6mSRJkiSpYZQAa7VSylH/Xv0uA1cacLkmSJEmac0YJsH4bhyLkmSJEmac0YJsH4bEUdFxKL17yhyaSWzHH
EOAXwG/BA6qn0mSJEmSGgaOIhgRO5dSbimZMOSF3fZXlvzK+Qnw+IWYJEmSJEmSJEma4a1YL21l8yIivrQQ0LiJJkiRJUk
b9qDhRSJiTII67y+N+gpTmJEmSpLlkWIC1AnWJWl3BmQRUEfEiU7Za43vCrDhuBIl5ZSZDlm5IkJkSZJkSZJkSZLUEgMsSZIkkSZJkaa4Q4JcC6J
EkagQGWJEmSJLXEAEuSJEmSWjJSgBURu0TEcRrVfEmSJEmSpJQZYkiRJkiSZkt0zYiTcRJkiRJkiRJktQSAyxJkiRJ
ZJEmSJEmSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1ZMIAKyJ
WiNhrIaVPkiRJkuaMYS1YAJRS7i6lXFFK2R9YG7dOHPcCZMkSZJkuWbCAKuplPL7lVSzbtfRxcslkeJjWGVxBjiRJkjRXTSrAkiRJkiQNN
sqDhues9c+8fuj3d756v4WUEkmSJEn3B7ZgSZIkSVJLDLAkSZIkqSUGWJIkSZLUEgMsSZIkSZJaYoA
lSZIkSS0xwJIkSZKklhhgSZIkSVJLDLAkSZIkqSUGWJIkSZLUEgMsSZIkSZJaYoAlSZIkSS0xwJIkS
ZKklhhgSZIkSVJLDLAkSZIkqSUGWJIkSZLUEgMsSZIkSZJaYoAlSZIkSS0xwJIkSZKklhhgSZIkSVJ
LDLAkSZIkqSUGWJIkSZLUEgMsSZIkSZJaYoAlSZIkSS0xwJIkSZKklhhgSZIkSVJLDLAkSZIkqSUGW
JIkSZLUEgMsSZIkSZJaYoAlSZIkSS0xwJIkSZKklhhgSZIkSVJLDLAkSZIkqSUGWJIkSZLUEgMsSZI
kSWqJAZYkSZIktcQAS5IkSZJaYoAlSZIkSS0xwJIkSZKklsyb6QMZuufef3Q7+989X4X4LKSWSJEmS5gJbsCRJkiSpJQZYkiRJk
tQSAyxJkiRJaokBliRJkiS1xEEuxsyBMiRJkqT7D1uwJEmSJEmS1BIDLEmSJEmSJEmSWmKAJUmSJEmSJEktcCCSJEmSpJQZYkiRJ
SJEktMcCSJEmSpJYYYEmSJEmSWSwyJEmSJKklBliSJEmS1BIDLEmSJEmSJEmSWmKAJUmSJEmSJEktGVuAFRHr
MSnI+I7EfHtiDh9XMuSJEmSpNlg3hjn/W/g2aWUr0FT4XBNWFWGAAXYAwYAAW1JbsSRhXY9cIQ0dIqOYQB9IyD9CdZWQdfxtRSY
SZtpCuQcrItYHtgVu7vPdiRFxS0Tcctddy2M5EiSJEnSWIw9wIgFIQFsSXtv0qpdhHxrDpp0tcVSSSwzNKOyLhuBF7kqZF3JNjdyuDsT
AOsiFiMDK6uKKVCO85lSZIkSdJMG+coggG8OpZzK8ZvrLWHewmcJsOzUSJjYiaLsrcX6zrPRrS+svSuuCS+MHmMSmTTZnKYn6IWm9lOdNvdd
1f0mSJEmabRbKKIKSJEmSdH9ggCVJkiRJLTHAkiRJkiRJUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1x
ABLkiRJklpigCVJkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiRJklpigCV
JkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJfNmOgEabv0zrx/6/6v2v22XIaqSm6XhfkPO6Lwbn0fFdvdDCe8xxKbp/+8S/KpJkJ
xdDSZIkaeGxBUUsSJEmSWmKAJUmSJEmSJEktMcCSJEmSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1ZIPrOkgAv/Tgqy1JXC2fS/Jdu
QkiRJc4UtWJIkSZLUEgMsSZIkSWqJAZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiRJklpigCVJkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1ZMIAKyJ
EmSJKklBliSJEmS1BIDLEmSJEmSJEmSWmKAJUmSJEmSJEktMcCSJEmSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiRJklpigCV
S1BIDLEmSJElqybyZToB0f7D+mdcP+/f7OV++3kFIiSZKkcKbcbIFS5IkSdJ7IIkSZKUUgMsSZIkSWqJAZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiR
JklpigCVJkiRJLTHAkiRJkqSWGGBJkiRJUksMsCRJkiSpJQZYkiRJkiRJQZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiR
JklpigCVJkiRJLTHAkiRJkqSWzJvpBEhaONY/8/R0r0f8dL0f8f/6UUmERrWRpEmF8VbH71GLOxdr0ozd8Or7+/9/Tcex7Pz2V2G3kSz1+WJ1WUXdxX
UySJM08W7AkSZIkqSWzRfzMJIMmsOnx6mDKNMb5dnqc5A2t7UUxmVwUW9nAuHB49XpIEyD9+wa9OpABQx2kkm5Kpl5kQD1s2w7ok
oZroVziBRkjROBliSJE2Cg5VIKoYxwJIkaSGzFU6S7rsMxucCRJup9poxVupoPENoJMA1VJ42CAJUmSNAWzIUiUNPv4HCxJkiRa
oktWJIkSXPQfaGrp3RfZIAlSZKAkkGXFfCBINMtXLAEuSJEmaQQZ59y0GWJIkSdL92LgDvDbmMdPTjzKPDge5kCRJkqSWGGBJkiR
JUksMsCRJkiSpJQZYkiRJktQSAyxJkiRJaokBliRJkiS1xABLkiRJkloy1gArIvaOXbVa6ZbrZQxPEMkaIMEG4A9TWFpvgm7bsDwwl7w9iBr4W4
7APsAVweERsMa7l5SZAVwPiSZL99gS0AHAJSXPb6Z1oVgXn33JG3FDc6VY06QHPYyr0aOr3LRCuxobNn4wbJ6VFKHCAyT4mJeu3gx4A9uNHvP
n42pMF1cBvMljS4Dm6D2ZIG18FtMFvS4Dq4DWZLGlyH6U0/zi6CPwPWabxfG/jFGJcnSZIkSTNqHANHVQFx4PypKIySERkqKdTk9ra8NpW1DmqBbeNgBsz
LkyRJkqQZNW9cMy6l/DsiTgE+BiwKvKvKuU8u1pzvbCOT79bEid6A2mC1pcB3cBrMlDa6D22C2pMF1cBvMljS4DtOYfmydXEiSJ
EnS/c1YHzQsSZIkSfcnBBliSJEmS1BIDrIaIWGqm0VErDHTaZhNIiJmaLkzrzcRytaCZgbuayLC8qfu02bNAR4Rq0XEotO

cxzoT/2rgtNsC501n+bPFbLgAzIY0zHXT2YYR8eCI2LPN9Exi2a3t+6nOq45cOuMi4mERsUsL81no51NE7AO8MyIeMs35rFfz9
6VbStpCFxHbRMRiZQZuWo6ItYErIuJR05zPtLZ/ROwaEc+ZxvSLTXP523TOpZkonHeOY2BW5C1TVddjhRlc/loApZR75nKQFRF
rRsTq05h+04hYt6W0zFTFz3TL7I+KiDOmOY8tImKDaUy/6nSWP8ysOLgjYj/g7cBTpnrCRcSBwPMjYsUpJuMnwF4RcdQUlt3qw
T2NbbA7wFQKARGxWURsP52LcLMQVUopU9kuBmYQEWdFxKZTLcxFxJLAbsDJEbHHFKaP+n9KmWcbhdCIWG6q84qIjYE3RsSBU22
BaeM4jIi9gXcDd09jHo+OiB2muB32j4hnTXG5jwVeTVY6fWcq86jz2Ru4vs7nuohYZarzmil1W1wHbNL4bGHmU3cD/w2cFhGPm
MoMIuIxwBsi4qHTKBQtCTxiKoXKiHgwcMQUp+1s69OAAyAL55Odz3RExOOB9wJXAsf0pGuU6WO6hdE6ny0i4pER8diI2HIK0+8
LfADYpF4nFqqImAecGhGfhKkFWbOhjFArn64AHt8JGCc5/XLAccCZU20YiIhHRMSJEbHIZK4PEbFVROxbr487TGXZdT57A2+Oi
CWmOg/gn8DBEbHRFNOwL3ARUxwRvebtN0bEE6cy/URmPMCKiP2B1wBvAK6bRsb5d2AVYN063wnXrVGQXLyU8jvghcAWEbH4qCd
xRETn4K4Z37YRseYU14GIOADYsZm+EadbF3haRLw5Ip4QEQ+YxLT7Au8jD9Q3RsQ2k0v1vSfbDcB5EfH/YGpBVp1m186JP9mLW
M/7GT++JysiLgR2ARad6oWklPJ3slD7CeCEmERLVkTsCpwSESuVUv7T+HzU8+GREXFBRBwTU2z5qBevyyPi3XV+I9cYR8TmZEH
ou8D/llJ+PYXlN8/pFaJWGkymgFQLtK8Bnl5KuS0iVp5COlYDLgGuiYitJjntXsDLgG9OcrqIiGWBZwEvLqV8ElgsIpaLWoEzi
Xk9BngtcDLwTDJQO7cWsiYzn2kXTKeq5o0vAZ5cSvl21K56C6Mlq3POlVL+APwG+D/gxZMNsuo6vAm4Efhz87yepB8CSwEPrvO
dTP66GfA4shJzUjXGjW19aV3+Qi1kR8TWwCuAE4BXAodExIqTPAYW62z3iHhcROwWEetPMh37knnbEWRZ5Q0xiQqUmie8FnhBK
eWr9Tqx0ETEpsC5wNXAbyLiAzC5IKsnbz40Ip4wtgQPTsO+wOuBl5dS3lFK+fkkp1+ylPIXMkC7CzgjJtmSVdNwMbACsPUkp3s
vcCAZ4L07ptCCVMt75wCfoRHcTLK8tgh5TfgWsGn9bDLX2MeSx9NTSik/mGKesBywPvCEiDhmCtMPV0qZsT/y4PgYsGt9v0jz/
4jzeHTj9cuB28nMDOow9EOmXafn/cOBW4HtR5m+Z9pnA58D3gW8DXjUiNN1hsqfV/9fBLxkstuhMb9jgRcDHwQ2HuH3ewP/A6w
HLAu8gyxYNX8zNB11Hl8EngA8FnjTZKbvM7/TyBN32UlME43XO01hu20DnDTVNA9KyySnewXwwZ7PlpzE9DsDp9T9uDhZ43wKW
TB5zIjH4aeBe4AvA4cCDxt13eq+vw14KXAVWTBdZpLn0b7kQ8ofQxYKLwFWHmW7AqvV8/8pPZ/vBuw4hf3xPOAjwEeB7epni06
0HclC4EfJZ/8BrAN8G9h9Csfy+cDv63Z96IjT70VeuB7RWP6hI067eP3/LmDLOu05ZAvKb+qxtMxkt0H9fHfgjSOmY1Pgw43jc
uh2H8cfsDnwo06+ULfF10bdjy2m4zTg88DTyGeyfBjYbcRpO2l+5BSXvXTP+2fU83P1KcxrP+By4GhgjRGn2bnmCTsBj6zn0er
1u055YeCxUY/hbae5/fcGrq2vl63r/26y0mD7EabfpO6/xclr5A/qPjwX2HsS2+7mzrEHrETmkd8AnjnC9IsDFwCH1PcrkkHvQ
dTy1wTTR/P/FLbhFmRlz7Nr2pcl8/YPNH4zmXLfc4AvAZv3fD6VMtNI61TztWXJAPGxPdtlpOXW/fjeuv+3Jcucr6rHwrojzmN
74PvALpNcz/3IctoejfXZGfgLcPok5rMBcAvdcnun7LriiNMv1/P+VPJ6tfwk0rAPcCdZVtmkmY5JbpN1gPcAZ5DXuWMnO4+h8
29zZlNYuVVqxrPpgO8nKswcAfwOeG5npwFvAd48wrSr1h10bueAq58/l2yJWWmC6VcHlqqv9wZuqK/PIy9obwL2nMS2eFj9f/R
kDvZ+26qu25l1224wZJpFgP9HFt7WaRxwV9QTf+kRlrsN8G9qoZZsffsV2b3o4sbvhhXMo+f9UmTBcqtOOiexHY4kW29WnuT22
6ru080bn42aaU7potMzjyXIglTnAvjIetJ/k7yQbzjB9MvUTOoeshD2AfICvFc9Ty5hhMAT2IEM9M4ga2s/SQbs6zR+s8D6Ag+
py96tczwDHwfWm8Q2eCDwM+CVjc+uBI4cZXsDGwNX9nz2X8D36vH02FH3Yz2HrqvzPAX4Ld2Kl2EFuiXr/83JAOMVZLB66iS2w
7zG69XJwsR55EV1aKAILE9WWp1X369BXlRPGGG5m3XSSeYLXwR+QQZbh5C1fTcDZ0wwn+Y2+AjwnPr+nDqviQLlbet2/wBwVeP
zRUc91/rtIyZf0bMlmY+fRF7QbwJOHnHaBZY1atp750NW2G1T3z+AzA8+zAgFLLJ29gOD0sWQQkk9h98MHNFcB/Iau89E27Qeu
xvX17uRNd0H1rTvM0LaVyfzoNeRgcR5ZI3/S8hWtFUmmD7IgHBVsqwx6QJYnc8DyTLB+8n86flkvvoK4EUTHZd1vd8EfIHMh5e
saTqjrtNE+VInX3xF73FElj2uZ4LrQ/3tWWRg+GDgMrIS9hv1/8Djumd5a/R8N2HFB5knfZIFK76WJytsBh6fA+a3EXBTfb0Me
Z177iT36aOAc6d4PFxKzYd71x/YaMh0+5Jlw13I8tEnyWBlq3qcn0tPpf+A+exPvUZ2lt97/PXss6jn0p8ax9AijWl3IysmHzz
i+q9E3tKzQp3vC8gKuO8CT2FIBRyZr78POKonjRfRLUNOdH3YhqzK2JTsMvwnal444vHzEBplIfJ8/hjwZDJvO3oqx0XfZbU1o
0keoBtRo10yw7m3dphujUCnYDMsA98a+ApZgDmFbMJ/PHA2Nbjpt7PIzHYpurWzl9eD/UHkxf1VwJaDdhiwNllLv3R9v0k9UU4
gu2FsSBbOrmdA5tlYz0WANYGvk5nfLWSNwqFk7dIG9ET8jXnsSiMI6jlg59UD/w39picLD+vVtJ5GFmY2rNvjf4EfkzU1H2VA5
l2313Pq9vokmWl9iuyatBlZIPnwiMfEHmRQ+OD6/mXAOyd5XD0cuKax7+b1fD9RS9yKdb+9qvFZJxNabITln1C3957Aqj3fDct
09iYvtmeTmfc76nF9PnkBv4EhtZTUix5ZoL2d7AZyIN2L6A11v3yGWlDrmX7Jxuv16jSPaazTPcBb6zGy1IA0LEcWQK5ofPZRs
hvDyUxciHgAsDSZyb0PeGL9/Cqyq+MN5Dm+3ZB5rEcGABs0zoHX1OPyZPKc7dsiyPznzuFkYPbaxmcnky04A4NUMig+D9i5vt+
CzAPeP4lj+FFkIPUkas07WcB8aP3sB8AOA6Zdh6ypfjQZyDyHvKA/fYJldvKi7cgL5iZkwL8+8PDmuURWQJ02iW2wJZknfrL+7
5xPfc9Fspb128DBZN53CfMXwDrp2BZ4wATrswhZEN6y8d2E53HPvB5Knk/fBc7p+W4Pes7zPtM/nLyWrVjfT9gC2uezy5m/JXB
nsrB+FYPPx842WJE87x/e+K6zDx5GTwt14zd71WW8hOwaeB61ooNshbhmhG23Rd3n76jnwUqNY6TT+rTEgGn3J1vTO63XqwMrA
58le5ncTOZpVwEn9m635vFFFsjeVvfXoj3bZ5R8Pci8ZT/gfY3PdyILZoOuz800zCPz9z9Tr6fk+XUGWbh89IB5NPPFq4GDer5
/IHmO7zzCemxPXp9+RRaQdyULy8dRe81MMP3JdX1fAhzT5zxZccB0i5FlmxU626Lx3dJ1vd7f+GxYsLo8WXb7HHm9uZDMI+4AX
j3RedX4v0vdFqP2dnoo8Ii6Hz9EI6CjmyctQl6jFqicr/vp68DrG59dCpzVOBdfWvfL2hOk5YC6H5ZpfNY5n/ZkQB5Dlgluplb
i1s8WrfvgE0zQIFB/N4+sIPgg2SL6q7r9n0Y2DnyNAYEaGWC+hawE/w7ZzfJZ9bsTgbdMdAyQZc5n02g4qMfvn+hecwZdW4I85
+4he4X8F1lmWhl4OnntPZrMK5460fkwyt+0ZzDpBeYJfR5Z8FmCjB5vo6cASka4l/V+Xr97LN0L1u5kJntc/fssGU2/bMhO/gp
5cnZ27nJkAfI95An7c+CCAdN3CrPzyNr+g+i2ZL2e2hWDzEzfQJ+uFMyf8a5Q/y9eD/bDyUz4NXW93k2f1hjyov0t4Hh6LrJ0M
5GHkAHTuj3f71dPhOPJ4K5TS/5D4HON/bRZXYcHDdgWm5OtFE8kb/y9h/mDk5XI5vBBF6BmoXZT8kJ8EVkofzDZBWCrIcdSsyA
1j6zZ/Sp5AVi88bsj6NNNhP7B88PIAs3LGp/tVPdHb+1vM/37kJn+y8nC7TOBNet3u5DHc98a1HpMvpw8H55MBla7AA9szPudv
dOTGcYa5DF/VP1s67ofD6rvV6z79hIyaO7tFrsvWZu2VmN7HkwGNMeSF67DyHsb39l7LNAo5Nb0X0EGSK8lM/MzgTeSrUgXNPd
LY7r9yXNyJbJW7DDyHL6+Hl+bU+85II/55ZrLJwOLTgvsfIUQugWqw8lzqe+x2LMfb6m//STZctOZx7PJyoclWbBAtw95AT2OR
gBEXhA+TgYmQ1vF6++fQ9bSX04WIJ9AXpBurt8/tX6/Xc90q5OtDWeQ+ciedR9exvz5zQnkPRjNaZsXq43qvjuHBSsJjqrruNm
QbddvG2xY9+XzB5139fPdyWN3x8Zny9Z98UG6x+fJNLqKDcgTgizcf47MT17W87uj6dNCT54/W/bMayvymnUm8JBGnvJDFsxbm
3nC08lryTvrcblW47tH09O9rGfag+vfruTxfTndruMHkrXdqw3Yjs35PJIM0M+gJyAl86jz6AkyyPPxdmD/+n4N8th/b92mu5C
B/kEjLP9N5PWsUzvdPBZ3I69FvfnqY8l8Z5vmOVxfP4vajYc890+k5rMDln8oWTHxOjJf3Y3u+bwLmf9NpofEG8n78Trb6RP0L
1A30/B4slJ2EbKc8Tm63Rw3JAvlC3SZpH++eD218qnxu0sYUvFUf7Mv3QLoZj3fPZc8x+b1pLtZ8XZcTfe6ZOH+E8CZ9btl6jw
GVXisSPbE2K/xWScgWI6s2HkDE1SokufCa+o224C8bm1Rv3sS2dNiokCp09NpdbLi4ZTGdzvQqIhofL4PGdR3jsdtyfPjmJ7fP
aVum+V7Pl+h8f0F1BYS8tw7vfG7R5CtjEO7z5L50TXUvKh5vJF599GNz/eonx1GXos63Up7j6FLGdJVtG6Dj5Hn82Pq9ns8WV5
pHifvBh7XZ/q9yDJnp8JuffKa/DEybz+K7I127IDld7pnnkWex73Xv2PJIKvTLb5f2a4TCD+DLEd8hMw/PgJcSwaJQV5jz+vdj
1P5m9bEk1rQ/Be+fcgm0c4F92114+9GBgVH1wN4gcI1WSN4Zd0xa9fPjqPbteoQsoB0D7Bvz7R7k93mDiBrtS6nEZyQheuDyIv
ibfQENuSF7s11Zy5KXuivJG/eXYTM/O8iW46+Bqw/wTY5kazlfzu1JqN+fgHdfqX9Mu/Oib4LWQi8N8hiwSbrV9GoeSVPjh/QU
xNPnjBnkS04E6V7A7qZxl71xHhkXZ8v0e0W0nk/sFBb9/kTadR6kBfDNwF/o9aWs2CBtm+3hXrsXEBmKJ0L6ZOoGfGANBxDnnR
PqO8fWvfr2fX9ytRgZ8DyNyRPzk4z9YHkBeP0ul23pFG4GpCGd9FTQ9747n3Upv0B3x9GXvAOaaT/h3S7e91bm90z3f5kZntgz
/osTp6Tv2FIyxMZgN9DZkZPrZ8tQwbK/8f8Qe4K9On+QJ6Tn6Pb5aiT1iPrOhzS8/sVGq83rel/FxmQrUIWqG4nz+MH1N/tSgZ
7E9XQPZXsvrRWfX9aXbdmkNXvfNyWPKd26/l8TzIYexAZ7LyYAZk2NZgh85Uzycqap5KFp/8C/kq3++UJ1EC3Z78dSV5Mn0HmR
7uRAdZx9fuDyAqI5oV5f7LFbEm6N/F3Buh4DXn8Lkt2GfwGjdagSWyDZclz5AaylnbQNngWtcBBo9Bfj6lL635+Ktma1K/CpFk
Qfxi1KyNZcLqEbreadejpdto4b28m87Tm8lcmC5avIQPgl5DdJ7fomb5Z0Ni7bst16zY8ux5bnWvWYQzIZ8lg5lPkvQk3k4HW1
mSL0ofJyoq++6FnPkeSFR4H1Ome0ziGjiWDmN7C9gPIlqNOl/VOL431yHzh2eT1qtMVeVh32VXrdjiRvJ4e2NxXdR+t1TPN3mR
3uNvptvQ0g7KdySBjhRHWf3sy7+wU5l9OXhs6947s12f5/VoQo/F3PBksf4ysTHjIBGk4uW7ne9eFvCbfRDd/WqDijcH54uF1X

3Za+J9MljV6g+fee7vfSa1kYP7z5Pi6b3rvZdqULMd0ruUnkfe4nkpea55IrTiq3/dtiWzM70Ty/N2mmQYyT7qQLHC/g+E9PbY
mr0svZv5KoVPqvhhYGVt/txNZ3tq9vu8EKg8mW8We2mc77k2ed3s1jun1yTLfHWTF31512m/Sc16SlQW3No65o8nz50bgv/ukc
YEeFgOOyTPJ83Rbuo0NR5KBw4aNZX+D7Mp6NZkfrUzmB99sHEPH1GNgzQHb7bFkOe4Y8hpxbr/0kUHSt1iw0umxZK+s6wfM/8y
6T/9DXq8WqITtOQZeSJYRH9Hz3ZPJfGmBbvR0bwnqtIgfV7fBrmRl16fJc2QpskJj2sFVKWWhBlj3NqPW/4fWndrpn/+seuB9j
CwsDewPSl6wX01eaJ5E936RzsVgBxa8b2PluvE7heiHAb8kA6Z39Pz2QfQUqOvni5EF6dc1Ds5jaUTt9f059CnQM39t/0HkRWT
HuoM/TL0BnAxyOgXW3sBiV/KEf3x9vwuZWR/fPCjIFrrHkxfFw+k2hb+G2qeeBVtE1qA7wMSggtQmdb+9l+4F4niyALM+eQH+L
Jk5f67ffOiekDuSwexb6/o/q/Gb5ejeENzMTIP5C5Unkxn9OdQaJbKm6HzyJOp38Wq2gBxCFjCfXfdH54KxHXkhP3OC4/oUssD
3beAjjc8fT14wnjFgusPJzKJTo7YEWSu9e+MY34I8Fy7qs+1W6pnfk+pxcGh9vz3ZDP/s3mnr6zXrfurcV7QYWcju7NODgdsav
+9XI7QOeSw+r+6DS8ma0nXJwORqhnTBoXtOHljfb1TnsUJd/8PI4/jJfdZ/S7Ky5Agy8zyfbm3mI+u++xSZYX+Her70Ow4b7w+
s6Xl6fb88WaB4B/CkftPUz/YHzu/57O1k/vS8up6bk7Vk/VqjH0N2vzy6LnNxMn97ad2eq5IFlG36TLtkz/unkUHUSWSN9KPIc
/MS8mLbvMew01KwKXnuf4BaUCKDs9eQhdLlyQqp9Ybsy4m2wUqDtkFjn15AjszVb99sSp4L99CnUEuj62E9hj5BBhdL1O3w0Pr
5Gwcsezmysmq X5ndkrfI15PnxMLKA9016CnPkuXxk3XfLkoNjfI4MDhclC6dnk+dc35r+Op/VqPcRkt2DP9Tz/QOYoFti/d3D6
7budLnenQy+v0qeUzf3rkMnXyHP5QeT+cHZdbt8vq77kmRXoQPoKZQ384o6/ffo5meH1uNvN/J4f36f6fYgK0cfRxbWPkytCKz
7YlEyz7mJ4ZV2QV5bfsv83XwXJ4PjS+gzOAXz548r0aeFkCyAbUgWvIcOSkCWQ26j2+tlFzJfXo3MH2+o26r3WB+ULy5PtyXrf
WS+9MV++7Exr773dtd9eAgZnPU7DvYku3M9l25PjNWYvyX54zUNE97vXKd9RT2G9qQ7wMIddb/vUNPSL398NPV+OzIoOr/uxy3
J8+F99Ckv9tmua5LXi8+T5cXnkIX1R9Xve1ty++2Hz9GtSH0I2evpbfWY6rcdTyVHuL6R7sAYR5G3tRzXm39NsA1PIltQ31WPz
+fXdf8SmXfeQfe+9UeTLcedCpWd6u861/sDyNbRd9Tt0fcYoluJ2rnlZl8yiHoetWxBlpefSZaBegPM/etyD67Hzpsa3y3RXH/
yvF9gPAYyDz6S7gBMq5MB2WvpaXWr+3fQmA6PJ/OkTlflU8nzc7P6foEy/3T/Wp3ZkAOjEz12msXXJAtmb6kb6YV0L+zL0adfe
d0YLySjzM5F40lkS8cbya475/eZrln7tV/doFvXA/4lZIb9ZeC9I67Lk8kA6MvAAfWzp5An2EG9y+xZ9leomTZZwL63dYYslH6
oHtAHMOSmVbKw9d+N5XeCrMPJwsQNzH9zeCfwXKxO97TOcnvmuwF58TiVAf2A6/wvB35Kt0B9CHnPVCc9rwL+yJBaVjJQfAXdm
p1dyabaZ/X87p3A1s3l9+yLz5OB3dVkLVYnQDq5Hlu9zfWbkIWGDcnC55voZjqbk5nHf9X32zCk5amm+X10L3w/YP5gaF/6d/2
4sB5Dx3bSV7fr04AT6/tOd9EXNKbrVE6sR3al3LNnvk8ig+NORr4zWXu2Yp80PIAshG5AFkLPIs+JT9MN9G9kggFXyILCVTX9h
9fj6yby4nczPSNKDjgvvkZerD5JYwAFMi84hgzml218Po8sPN7W+OwndV98pXFMbUkWNDfvPd57Xj+UbiHiUWTrW6fCZIW6XwZ
22yAvZleR5/EiZHegc8iCw9votiD16x65H1nw3JdGiwbdezbeyuD7ZLap27gTWD6QLAC8m6wEOrkeR48mg4RmcLUX8GuysL1X3
Z6fo1ExROYrbyEL+hN1vZnyNmjMY896TD60c7zTPeZPIs/zYfshyJa/s8nKma+QFVmL1u92YsD9aGRh6tM1vZ1WpnlknvDixu9
Wo0+ARHeQnI3Jwuu65HF9ZuM3a5DXsIEDxtAtxHZaZTsDhhxF7dUwaN0b26zZXfpldK+t82raVmNAd9W6nZ5NVnT+jLyunUAGL
JfRp/vPkDSdUtOwe31/EFkI/BoLtv7tRQYL+za21ankNXHHnt++lZ7Wv37HZz0O7qBRMUAGWS/s3YfMnx88mwwevkmtHOhs2wm
Ovd7Kv43q8Xgu2aPhlrpv713HIfObKF88lizQ9gb6o9zb/USyULwJC3YD7u1eeh5ZkN+QvM79kAySDyTzjr7dVAesU2effoes/
Pgy3eBlm84+7UnDcmQedCXd1oet6/q8jax4GZin1N8fT+ZFZ5B55Lpkwf/jZPDwVfoEun32w410GwQWaaaVwfcSrlq34bPICqx
OxfjRZNlj6P2xjfkcTeb1u5IB5i11/y5DVpTtRj3O6/pdU9PbLAdeQ+32W98fTJbLBwVX25L52Qfrtl6fvEacR1Yw/Jy8NswjW
/A27pl+S+APdMs069U0XdD4zbAK2M79Yb+t++ki8tx/DJlPP5PM30YaXbfOcx9y1OzOOX163ZaPGHUek/lrfYZDVuxxZOF1KzL
DOLl+vgeZCb2eAc3+ZCH7+nqivLceqKfTvRH7CXXe90baQ9Kxd/1d88K3LHlhn2hUoieTF+0d6gH3Jro12yfXzxYYWpxuc//ej
c/2JYPC1RqfvZcBXQ7IwvNOPe9vYP6WrE+TrTHv7Zl2V7qZ11NqOjuFiEXIC0On+8ea9M9o1qXbbXFVMjh9Gd0WvZtr+jsFgr6
1rHQzpJeRNSydlsDFyIDgM3QzsS3rwd9p8n4MmdE+n+6FYgUy0/4oWUv75cb0CxxPZEHhArJm7uqa7ifTLYRsTo6cdvoEx8LKZ
OHjVroF3GXJi97AYJ28H+T99fWijemWodsidGBzW3X2U/2/OnmxO5O88OzeM/+jyXutOgFDbwvHrnRrhc8iC1I/ruvyjHocXUU
eswcyuNtAZz8uXvf7A8hz+X/JjPAqsnavb23SsHOS+Qe7WZb5W2bXIi/sG5AB1Xn1/+vJvv6HkAWJofckNOb3LPLcfyvw9vrZg
WS314N798OA99uS+UKn4ufeexnIQt7LmuvUc07d3mcfHkNeMINsCX43C3aH6Aww82oyb9m9rscz6vdPJC/Ez6n7qNl9rTOQxhF
1/c8kz+dLyYLb2o3fPpwh9zpNdxv0zGOZ+tvX0rho0u3tsECldD/XiXV+fTAbaKzW2waeoFU8Djt+N6daMHkcGu78kK5G+TOZH/
6jzuZoFz6fmOboKeW16IdnSswGZHzSvNYsMmHZrMk9ZnOxF8H26FQOd7ixDz8X6ul936QXWf4JzYtm63w9h/lrmdzLBCFtkHn5
Yc/+QQc6jG+dv70h0893z1bM9TyeDrOY9fb3d4FdvvH5sTXenMP5SsoC83pA0N7ffY+p+X7Huk+uA542wzdZrvF6HvC4FtUsV3
UqDcxhxxDuG54tLsWDl4aj3dl9Nnut9W5J7PtuarMB+AVneOpwMhL9Eo+JzMn9koLUa/c/n5r7Yl6yo2aSm+2K6LVmvJCshJiq
znUKeu3vV/fr/Gt/NI6/9A0f+G7Qf6v99Gsd1M90PoXuv5iI17e+oafgQ3QD7hLptJ+yORlZaN/O6s+kzdkH9bqt63G5Zj7dr6
//rWDD/6vsoHDKwvIPuYEOXkl34Tm38ZgfgPb3HXuP7B5PX1dMa22NtMrBtBlmD7snt5MtrkeX7D5D5S6fl9Ktk+eX9DLgveMB
8e4Os55LX0AXurZ7uX2szGnHF+gU3i5KZ4svp3yR/IY1RpOpnR9WT66jGZxsxQXeuxm8fQzYVrljfH0dmGsO6HXROlE5guDQZk
HyabkFshT7T9WtmvqS+fgV54dyRPNG/Sp9uB2TT5j1kbcBbyULR2mStwWV0T9idmf9erkXIQtz/kaO9rEsGUO8gCyPNmtTD6jb
oVzu7DFlovrSxHseQBZ+VyBP5+prGtw/Yfp0LQzOgPIO8sK5b3y9GBgA7NJbbuTdlb7IAdypZWHs7tesAWdPb+d21TDBMe93eL
6vLv5QMBLan2411U4a3IO5HBhQb1ePzedRAgqxx+ypZU9ZbCF2HBZ9ztS5Z4fAisobwoXWe/e5X2p8MCJcjC9hn1N/u3vO7i+j
eR9SbhtPImqdtyILUo8jm9+ZolJcyQk01WYBYgjx330N2lewcHxszwqAOPefkd+kWDIbVbH2RDKjXI2vEvt/z/QWMNqrWI4BP1
NeXkcF75xh4EtlKuywDhrZm/vt0Xli369Z0KxmeTBZENuqZvtnN8bqe795K5k1vJiulFq3z7i2UbsaQAWbqb44g86ze7qQ70L0
ZeHMyuDqTDNYuqvObqPvTtLbBkPmuRd7v9Rmy4ubl9bgYVMvazO82otsttNMl+kDy4rzA6I9ki9bfyUJOJ73bk/nj2jUtK9Xj6
VSGd+3rVIBsQVZWPI9uBeAv6WmZ75n2DDI4fgtZYfAoMj+4g2z5WODejsb5N2p36WOZxrPEyILWLSw4yE3z3uolyIL4W6hd8et
3ryHvp+03gEDvPV+dLpZr0Q0OTqPRnbln+vXIssBi5HWx05Xxk3Rb8l9MVvz0y1MfQqPnC5nHXtZ4vwmZDwysuCUrvW5s7Muby
PPo+T2/O4SskJuw0qkxzcj5YmOaKd3b3fjdKWRQ+I66HzqDUJxJBo5LMIlnVI6Q3n6B3Un1+F+XLMdsVI/rz9O9DWH9PtNtTLc
ssAhZxlqSHHDmY2RQtQSTfI5bYz+sWN8fS5ZHNuj53SpkXvwTssV2h7rMN5Pl3MPIQOeA+vsFgqsB2+O/6Bklkax4G9QSfRaZ7
65DVozce080Ezxbk8GDDV1Go/KYPC8/wpD778iy1jnkOdjpvrg22Thw8QTb+0oyH9yBDMp/SXewnBXJypP3kfeK9618GjL/fer
+7FTEjFxWmdRyxjHTEQ/UFXo+7zei0z5k7VOnlqBZQ3MaNVPrM90oY+HvQ154n1FP1r5N7c3XZI3gtXQzqUXIWpFXMTw4623ub
94X8/x6onyA/v2IOyf0SWTg8BYyA72ZDBJ+WE+kIwZtgzrNr8nm4DXJgkUnYDqDrOW+o9/yG/N4AFkQ/3lNy2PImoNOzdwa9WQ
Y9hyIfcgCwOVkoW5JsvbgqyyYUTXT3wlSO9221iVbTZ5AnvifottP93IW7PbwCBq1qo3PXkYWnN5FNp8/nImHUV6CrGH/GHlh7
fQJfx49o4/1mXatzrqSBZLF6A4zez55AXsgWbDsHYSk0wq6b+OzlciLzduoraNkofpWhlxAyAvod+jT9Yy8KCxQkJpgm2xKZnI
vmmbesA8ZXPQNjnuOiRvIQul6ZBeG19TPO4MtLNBtgAxKtmu8340swJ9B40JBt499v9bo3ptlmzX8LyALAB+px1TfwIBuzdkq5
PnwoMZ3J5Ln6DH0BEz1+2EDzHyRBYO5oZVGjf33EvJcfAV5bh0x6FxoYxtMcBwsRbaknk22kA/sGld//0bg4/X1+uQ59Ra6QVb
fLiRknvV1skD89rrcpevrToF/XzJ/6e1S1qwoOonMT88lK0g2J/P0Z5N53Ho0BiVh/mvLrsAn6+ur6Fa+LV6Pz50ZPBjGtLpLj
7gvHkj3/oph18jV6Z4/J5OBYqfL/D7kObpev3OBBe/5+gR5TX4XWaBfgTy++wVIW9Zj7TlkQBBkYfS7dR90Bid4PgOeCUmeb4+
o23yTuh82pxt0n8OQh0uT+foX63JvIs+Pt5I9Id5Rf7MT2Xox0rOGeuY/Ub445Xu7WbAC7qS6/TckW0jOr5/vRhbUz2ASraFT+
aPbvXy9ns+XJc+pN9H/Hvd5dRufQ7el64312P1Q43cnkGWHyT4Xbx+ysuMkBtxfXn+3J1leeSlZJnpPTVNnpN/j6jHWr/WpeU4
dQ1aiH0meX7eR1+6Nyfz59sZ6rsz83eiXJcsFu5J52hX1b5QAfaLBhi4hGzm+wIJ5Qr+y1sPI/Ocsuj2p1iPLj/1uoWhWpr+cD
OzWqet9F/DCnt+vOMXj7IC6Tft2D23lWB7niTLBgToww6i/eSJZy35SPVD2Yf4L+dL1xNlmGunYH/hn74nSc5A/kbzAPIgsEL2
KvAjsSPfCMbBms+egaTYzNy+O0e/AJ7tcvZusxVujnnAfJgtEq5KR/WVkX/mLhqzDVnXal5K1AGvXE/JI8iJ2NgNuWO6Tpu3IV
oPn0r3fplN46K3pX5PuM4k2I4PBXclCy4upNYVk5vN1htSs0H0+Tueepcvp3kv2X2Tg+xX63wC/H3nT+cE9nz+CLAg8kswI39u

bBvoH/qvW9H+I7OqwFd2Lz2IMDrBWJDOVTuFtHt2ufDvXfb0kWdO5ZmO6QTc9L01eCJ9Cnk/vIC8Avfc3bNi7f+n2hd+2vl+np
v9bTLJAXKc/rh5HEz6ceoL5HEBWRgzqE98Msj5CN8i6hjw3vkTP6KGN8+8r5AW3U5O2BlmQu6Xxu2eQFRnLDtmPjyMLcJ1AqZk
vbUjmDbvRv0C4FxnAdmrXryG7QfV2YTupHg/NlsVRBpj5MpPoLtGY96Zky9HZ9dgeesPvdLbBdP/Iyp39aQxcUvd7p7vKBmTA8
17mHzGttzC5GFnwflZd94vIvPY59Ri4jj55CnktOLcePyeRAdjWZOXZm+pvtievDadPsC6PrNv71Ho8d0aD3ZHh9/xMu7v0iNt
6KTL/HFZxdhpZ4LyJbAVdhgyyLiPzyK8woIsew+/5upTuUPHDRit8Flmp8hCy4Hxj3Y/vIrt87t1nmkcAVzfeX1O3f5AVXZfXd
J1Gz0BLA9LwSvI8XoHug6DXI/PTN09nH9Rp++aLTPPebnpaH8jzf+W67teTQedidV4PZYIhxKe4btHz/0F0B3oJuq3lK9b//Qa
u2r5OtyZ53r2iHofbkgH8M+vvjiErkzeeYlr7lhn7/O5RZNf7VchKos+QAc7iZA+UQSOpdrbB08lzamfy2r8rWR6+iuwq+Rm6F
borkq3Ar6PbMhZkWfWK+n7Jul0uG5LmyQw29Df6B7mDyloPIyu9Dmh81m8/9lamr1PXudNLbBMyn3h5b7qnuD9ba4ntO/9xzny
CFZuoIHUW3Qvm6eTFby9q1E8WLt/PBMNfj5COfgXozoF2LJlBvqmeLNuTmcx/1QP800yiRooFm/snujnzATSahckLeqcA2KllD
xYcfvsxZMFxp3qALke2kG1K1oj8mkYr3BS22drkRfDN9WQ4o3c/khn6t8lgYbm67S7uLLPO4xK6AxJMGOCRAe0P6v64lvkftLf
8sJOlTvsNuqPsdfbxScC76+tVeqbZj+wasSYZjDaf8bUymYm/j8xEt2DAxYf5g+nnkBlEbxB0CX1aLHrS0mwF7R0MZAPyYtL7T
JgVyMLgK1hwSOaTa1rWJTPgJzL1C89m5IV8WgFWndfQTI/+LVkbkAW8g/v8fl8y8Hx4z+dLkefTm8gg/2QGPB5iwPHU7Mfdqb1
/JMMHd2mOKrUL3aDpmXTvXzqWrMHdpGfaUQeY+SRDAv0haduCLFwOva9huttgmsfGxWRB+DKyFe2tdO/RvAW4vL7emNqdpGf6P
eo+6Jz/u9Xzai+6gxEE2XKzTe/5VKfZhCy0HU12+VmFbmCzON2RC7di/oqS3ene6/Zc8txcmwWD/JPpyd96lt9ad+kW9sdjyVb
5tcl88ovUkfvIPGGUFshJ3fPFgrX1y5PXoj3q8fvi+vnxZKG2b2s+eS2+uL5ehMyDOwO1HEAGvu+kz7WpHjevJwu1nW6hnYfG3
nsvdT0+vzooDZPc1sv2vJ/Wvd31mP9AXc/OveQX1mPrPXQDm1No3P/T8vHT776xJeo2a3ZvPI7MpxcItOk+p2q7+n5NsnLkpWT
F037kteG6Ot9p5U2MeI2je91Ztr4fGKST1+BO2XaVetyuQrdrYydvXbT+9d4/9yCyFfsXdB+1MY+8Nh7eOM8m7ErH9AcbGlTWe
irZuj5RL6G+lel0733bnLxHdRXG1PLU2vE9owufuCD1RuD4+vrMevLvXA+cK+kZXr2F9DRv7t6VvEB1WmBOojHaCHlxnEqXiwl
b73p+fy3wtsb71evB9iFq94fGd80aiHvITP8yMiPen/rcBbKQfw8j3hcxIF2LkYHThfT0Ka8n4Lc6+66R7h8y/0Ng30q3y8JIg
R5ZkLiH7oiUIxfoyQzvts6JXz87jGz56b1xen+yVe2Axjp9n/lH9du9zu/yfukn7z3oNOE3nwn1/8jWoxfSHSnrXb37sc/8+t7
0POT3ndEjt6tpeRE9I+ox/9PUp5VZTWZfTPePBYOsG1jwURBBVsRcTU8tNlmQPpustHhY3Q4vZMjz0vqkoTfAeAZ9Hj7bM01nV
Klnk4XhXchg4DKy0uY6Mp9pPhdulAFmrmKCAWZGXKcJu5BMdxtMI21vY/5Wh9XIgOvNdAsntwM39EwXdEek+k09h84hA9l1yfv
tjicDgrdSW5L7LL/ZPfMx5OhWXycLbR9s/O7pwEk90+5NFuhPI8/5r9B9aOezyGvd2XXa2xh8z9m0uku3sA96a7R3p7bQ1Pedn
iX7TXM5g+75WpHBtfXvILsafodsvbqVPvc/0i2o7QT8nu7gNkGeh1fR7V7a93wgKyufVI/JV9dj/tNk0PJOslXxNDKYbnUf9Bw
HB9b3k7q3ux6PN5PB/Evqtlu5rtdP6I6keyzZ4jM0SG5hfTr3jV1E5iFr1P33rpq++fLEnvX4At2uoKuR5ZIHkpULZ9VjZjGGj
J45xvXatx6PKzc+6z2H1qA7IFEnGHsDWXHyAbqt2s8B9phgeZuQ3bQ/SFZEvQ143STTPOnBhgasd7+y1tsZoYspC1amd65tC9z
7O5v/ZjwBPRv1hLpjOkHMQ5l/1JcX1gPmy8CFgw7YKS67U/v3zPr+v8iazWfSLYyeSNaaDnzi9YjLOoAhrXf1N51C4jJkd4Nmw
X518qLc98Zpshb1zeTFYv+a0bycvH+qM+b/6Ywp0yRrmzp9txep+/FJdB/QeQIZwH6dPjc+jzD/fciL+KRrBcka1x/XY+k55MW
ntx9x58brewfbqP93I5u/T6nvDyYvZoNG93oCeeFdsb5fomcdnk5mZM0heCcaDru3FbRvZlV/dyF5gQ2y0HUOjSCr/u7sQcfRb
P9j/iDrWhojHNXPOpnyO2ncb0Z2qfw8eWFe4NEOUzgWv1HPx+/Q/1lVg0aVemw9t/eo3y1PBvLNi/FkBph523TWZZzboIVlnE5
WTN373Lj6f20yqGh2GXlZn+mbI1J9nWw12ossZF4LvK9+vzlZsOh9sHi/7pmH1m3/PeqDwOuxdQeNSqd6Ln6T+Z+xtQp5LTuHD
LA7Q+K/hIm7H025u/Q090G/nibbkHnl+o3PzqHeNz2FZQy856vxm2G19UeSXef/H0MGk6jH6uVkxe2dzD+c9fsbx8OoFX8PIbt
rPo8sRJ5Tt0ur+6DPcTDpe7tZMEhfu/525/p+S/K6eAmZR45c6TSJtA+7b+wj1Iey1/10Sr99yYJB5oPIFr09G+v1QTJ4WaiBV
U86h5b36udHkS3op5LX6+eRPR06+d0hdR5Du6rW33YqEF5Olrd+y5B7cQfMY1KDDQ2Yx4RlrQmm761Mb46EO6tbru5N50wnoLH
B3lYzpCvqib0XWRv2HmqBtv7uLOrFrHNwtrT8pclg5Gq6IzCdRNY2P7Hxu2MZMsLcJJY3rDvbvc+yqP93IvuIv7Lxm96H4q3K/
PcbLEkWBl5MXgS3JjPdHaab9hHWbXcyY34sWQN1JXnBfA1ZoPkMWcA8cBrLmDBIHTLttmSt40vo3/2j343XN5E1m5+pGc27yK4
YQ+93IWvYmjX8za4tvbWzo17MJ7rpeT+yxu9A5h9AYRsys3xt3X5PqpneyKNazba/xjnyfBo3v5IVNW8kC68fpjE0Mo2gvu7Xr
aeZhv3IC8EC82H0UaWOGDL/aQ8wsxD2w8Bt0MK896j78SNkoNXblbdzX1vfZ/qw4IhUq5NdY59Rz/UXkdec9aiPrOiThn7dMw8
j85DTyC6fH2TBZ4ktQbZQX9JJU+OYXZksWJ40hW0y5e7SU9wHGzZeP5OstHgR2Wp2KpnfH08WpL411WOREe75avx25Nr6xrGwS
N0+n26cP0FWEFzUeD/hQ0cb8+z835S83r6CrEAcOLpai/tl0vd21+96g/QbyLzwjWTX143Ilp8Vx5DmUe4b+zCjBRPNIPNGug+
/7ZxjD6zn7cjP6xrTfuo3YNLGdEcfDvK+1rfQrSx5C1ne6DwyYqTbUWiUh8hrw5Tum2OSgw0NmMfQstYI00+5Mn02/M14AupGv
Ar4cH39ADJafkl9vwH1pt0+0007uCIvsJ2IfyvyYvzfNZMJ8oJ+HrUf6xi3wZF12QtkKuTFfdOaAXa6SXZG8Aqy//qPyAv/WnR
bN5Ymg6w3TfUkm+K6LE1ehG8nA8Nd63belqylaQYZs+4GRQbfeL0zGSQeQ7Y0jDQ0KN1uVM1+8dczwQ3wE8yzb4BJ1j5+jwWfm
3QEebFZg2yJ/RBZeTHpUa1m2x9ZiH0l3eeRdbp3dp6xtk09Fo/tme6JZK33tLvwMKR7JBOPKnVsPU+XG3Y+MIkBZmZoP7TeRZR
sjf9MPX4fUM/Jzv1LnXx7BwZ0F2f4iFS/o7Z6MvhBoRN1z/wy2cLY6VLWb9jljeh2V+rk252uLi9kkl14GvOdcnfpSS5nlZqnn
EV2p/0cWeP+WrKFZFmycHgWWfE06YLUNNLWr7Z++UHnEd1r41XMX9HSqSAY+mD0EdKzBVnZs9AKhEzy3u7GdJ0g/QIyHzy4Hte
3khWgk2r1GHGZk7lvbNRnGS7Qdb7+358MvGZdawfdirffkN00n063JetsukHWVuT1a8JueT3zn3XrPI1t1besMxf+ZjwBdQPuR
xZAO116Dq0Zdef94cBx9fV8T9Ce5nIXq8t+CRkQvJ7sp7s3WYDpFIA6z4hpPcOp838LWQN4HtlU3+lzu8ADTsnCxbPJwG9R8uK
2MjmK1m1kzfar6Y6+tARZALiSaQ4IMoX16r0Rcw/yIvjA2X6iMPjG60uAI6cwv33I7lPLkhf397eRxp73y5Otbp0hyzuFuNeRt
cofpzvy0BJM8DyMufTXWNfe7p2dobcPJ7trPoO88D6NDMJa7/4yIH0TjSo1Ut7CCAPM3Ff+yMLGxnQHxHkgWdF0I9mFpnMtuIY
6sELP9KOMSPVz+nQprN9Puntm736gW9jbiKwofAGNFjgyWHvONLbRWGt467nyPLKS4HYywO1cW1YjKw2upfvg+ik/a2uK6Ru5t
p4MxC+v5+CJ9XzsPC/wQPKaOqVBfnqWs9DvD2GS93Y3pusE6c0HVC/CzN839hUmcR8ng59TNe3eRmPcZ52Kt1PJivP3kfeUvr3
maU/nPnSNnua2Gutof2NL90wnoLEB9yEHEXgw2Z/4hMZ3O5CFw0k9TGzE5a5C1gT/lm5z7fJkkHUt3UEYxvMgsgx83lVfb0IGl
mtTh7VtXKB7B2FYiuxz3OkG9VyyC9KWNe1/JVtbdiFbwM5lhOHkx7SOi5G1VF9nmjc/z/AxejBZuzfyM6J6pt+nZqjNG/Xb6uL
6ILKC4KR6oeoMrrE62Qd9VbKm7HxGrOGci38Mfq7OtWQ3so+RFRkXM4Xh6KeZtpFHlZpgPgMHmLmv/JGF9/fQHYDlWXSfq/SQu
h+fRbagXNSYrjfAmdaIVIzePbPZFXcF5r8/sBMIdoKsF9b3R9LCAAKMqYaXbktwZ7uvVc+h5vZehWzJuroelwu9JXXQOrNgF77
tyMEw3kRWMD2LrJS8mKx8mdL5OFv+pnoc0A3Sx97LhWk8E3TE9ZjwOVWz6a/mJ98hK9rWIStwPkK2rn+LaQzt79/M/814AuZLz
ICm3vr6aW1lgMxf63U8WSN6MTlyS+dCPK9eYC4d10FeL1i/ovusktOBP5JN9r+kcVP0gOk7wwUfQna/u7NeONYjH8h2Plmb/84
Z3KeLkV3rPkGtSZ5rf4xw4/Uk5rVZ43VrhZHGsXASWeP8NLr3fXUKeKeQQdhYHxQ5w/tqWPfO8+gORzz2+yMGpG/CUaXu7390e
y7sQnah2YPsKvNFagtDff8V5h9hte/5RAsjUjFi90yyS/tHatoX7U0b3e6C/00WNFspBNL+PVeDBvrZlezO1bwvemXG0OLR4ro
0BxfZmuyx8layULth3bfrz3Q6Z/I4oBGcLYQ0Tum+sRHnPdJzqmbTHxl0fp9u9+GVyIrR9Wc6bf5Nc9/OdAIWSFBG9N9mglHSp
jH/5kXvSWRT7LpkIfrNdIds3b5mBOPq134kObredrXg8DFyNKxOl4VnkLWHK/SZtjlc8F5kbUfnmSMfIm+o73TjmDfTJyoZZHV
G3ppzhUkmceP1JObZVstV81h4NNkSewV5T9IzqLWS9Xj7HPfRFo+ebTKoe+fFdAewmbHjkDncp3whbJsXkN3yOs9yOoJs9VmhH
sNvo1tx0LxnY+j5RAsjUjFi90wyCHsvsFPP580g6wqm8EDohbgfhg3081lysI+XzHQ6B6S9eY2fRwbpb2h8tn09pt7NGB4nMFf
/WIjdsJjifWMjznuhPS6kxTR3enCN9AxC/+bG3yLMMqWUG8mRiH4REUuXUv7d1rwjYhfgmIjYKiI2Iwugnyil/IQMUt4MlIj4C
nmR/04p5f/aWn4jHauRBfZdSimdoeA3BL5SSvl5/dn7yT7V9/RMuwlZC/v2iHhAKeXj5D1iZwL/IQsBx5dSPhwRS5RS/l1KubP
tdZiMUsq/Sim/qq/LTKZlKkopfyulXF9K+WGL87xn4l8N1+dY+AQ5otk/gX+Rx9TnI+It5PHxjFLK96a73NmulPLXUsqXSilXl
1L+ARARB5OFxc/X38zYcVhK+W9gt1LKPXPxfBiXiFiEHCTgYOAtEfEwstDxBXLEvs+SQ3OvUSf5fZ0uJjqf6rmxH/DpiFi9lPL
3xncj7YNSys/IHg1nkoMA3NDchxER9affIis+3hsRj+h8Xkq5JyIWrfnIk0sp3x1luTPkj2Sl3+vI7nPrk90r30hWCJ4PPKpey

```
2aNiFiBfEwIEfE08t6qBwOPj4jXApRSbiGPqz+S+aTIfHMhLutGsoLiKxGxcinlny3Ou/Uy27iVUj5CPmLhEzUf1H1AzNbre0Q
8pJTyjRbntzfZ//oNZBeH35GF0U3I0dy+US+Ey5DNzLe0WaBupGPJUsrfI2JXMog6rpRyfUTsQHZhuayU8qaIuBz4ZynlKT3Tz
yO7Pe1OtnhdRdbYb0behHwM8NtSytPaTrtmlwHHwgpkYPXNUsp1EfFIslD6l1LKL2YqrTMlIh5IDkrwVPKhh9+a4SSpj4hYtZT
y24hYgrzh/QFkoALZresv5Ih7BwE7llKOneJyDiCH0t6ejK1avQBGxLHks7CeTnb53gB4cSnlS20uZ2GIiGXJ4GQd8iH1ncqKd
5OjMX5iNlUQRMRSpZS/RcTZZG+On5IDKvwiItYgu5ReS3YXPZgcrOh+lyfOJuM+H+eaiFh2YQa6Gq9ZG2B1RMQi063tj4jdyed
2HFlKubnx+UHkTbpbkQ8u/ua0EjtxOl5AXnCfXwsTR5Aj5pxRSvlORGxPtqKtR44yd3KdLsiL3JKllO9HxKrkyDOLkPeZbEzep
3ALWeA+FDi7lPKnca6PZkZErMvwY2E3shLh2FLK32YupTMvIpYiR2v63jgqTDR9EXE8mQffUEq5sVaGrU0OQLAk2eXuccB1pZQ
DI+IS4HmllF9PcXljK8RExDnAXaWU19b3Z5OP/DgO+GKbPTJmQm0JPpOsrJg151NE7Ec+V+4l5D1hl5NdMndo/OaBZJC+NNlls
LUKXE2dQYXuq+bNdAIm0kZXKnIAiAt6gqtXk8HNDeS9Kc+KiFePqwtVo/vL/sAKEfE6spvC54DdIuJHpZRbIuJ0ctSm5zSmW4o
cqWrxiPhAKeWDEfEj8knfHwfWJEfDOpG8uDzd4Oq+KSKWYbRj4WCyC8z9uiWzBpjXz3Q6NNRN5KiI50fEufX948ku2l+IiKcDf
6Z2CZxq61VHW4W52jWxt4byDmCLTotcKeXsWkt/LNmCMicDrD4twbMpuNqfbPV8cSnldxHxp1LKjhFxXkR8CXh8KeUuslLqlAH
7TTPE4Er3VbM+wJqORkb6IOBPjc/3IQuiTyBrun5JDigxlqCk0f3leLrdX/asX28F3E0OTfqbUsqXyYdXNlvv7o6IF5HP0nlzv
dj9kOyG8sNSyq0R8RSyMH15KeX341gPzbxSyqjHwonkIwCkWa2U8j/AGyLiFnIQixXI+0nPjYhjSinfjYinde6taKNXw3Q1C+k
RcQiZ5j+TzyM8CDgkIm4n7xe7jexR8PcBs5sL/kh2rTtglgVXDyBHDT2hlPLViFgSWCwi5pVSzoiIVwLXRsSHGkdGxM6llN/Ma
KIl3S/M+i6CbYiIR5HdGp5XSvlaRCxGrvs/I+L55IXjw+O4AE6i+8snSymPGWF25+25HPt7qRHHp6BXJQi/+ZDQUPLTweC7qviYg
NyZEDlyErDd4L/Fenlnu2tT5ExAnkvVYXkM9VOhf4ETkc/1r178RSyh0zlsj7sIhYibz39NnkdfxMcoj8pYBvlFJOqi2g6wBXu
B8kLSz3l9FKvkwdiSoiHlZyVLt/RsThZFeUW8dYu3gT+cT48+vF+Ifk0OxLllK+QBYirgBG6g9ectTB48juMj8j77d5fO1KOGs
KHho/jwXd15RSfkQORHQxcDNZEfbXxvez4riOtBxZOXZSKeVC8h6gg8gBHBz+LDBQfZ6F+rP7IgqMdvpcMdpeLiL1LKW8juw+6H
yQtNPeLFiyAiFiLfKjwnmTr0d/Ii+GBCyPjjRwi/m1kwWF94GHkM3m+Gzkcfaf7y0g1tLUVbknywbGvH9e9Y5r9PBZ0XzcbWq7
6pSEizievJ++r3XcfCryUvI/2fj3AzMIyZLTDdwKfKaW8eybTJ+n+6X4TYMG9I4ptRz7k7ufATaWUHyzE5c+p7i+SNBN67nGa8
XyxJz07AIuTj8U4lOyeexE5iMWTyMGTnlRafLaPJqeOdvg8ckCO/5np9Ei6/7lfBVizQa1tW5N8YOOdpZSnz3CSJEkjiIhTyZH
0vg88kHxI/P7k4xGWA1YFnuYQ4DOjz2iHPvdO0owwwJoFZkMNrSRpfhGxaCnlP/X15mRL1RNKKXd4Ej3B4JWllNvrb94O3F0hHtZAkCbj/jCI4qzQDKoMrSZpd6uM0LiAfDLxC/Xh
RctS6h0fEmvWzrwF/WOgJlCTNarZgSZJURcTuwDuBI0spNzc+fyBZKXkB+VD6fwM7Akd4r48kqckWLEmSurYFLugJrl4HfJt8i
O2hwGXAV8nHfBhcSZLmM2+mEyBJ0kxr3A/7ILKFqvP5PuToGI8DrgT+Ukq5AfjjUjUjCRUkjTr2YIlSbrfa9wP+yPKbMbTJ
iKeUL5CAXK/SZXJKkexlgSZLU9WXgC8BhEfEf4Am4d4dPLkm6v3OQC0mS6BrXgTJ
kma/QywJEnqUR9aux3wGODnwBB+Aw4i77m6YybTJ
JklpigCVJkiRJLTHAkiTNCRHxwoj4dkR8IyJuj4gdI+KZEb11p/p/zYi4pv3wSpLur3wOliRp1ouIhwPnAnuUEAs8hntb
wNfBLYvpfx2kvP7ayll2TEkVZJ0P2cLliRpLngg8OmI+DR0W6Mk9bq64Mi4pL6eoOI+FJEfDUiXtb4zfoR8a3
6esmIuDgivhkRt0XEIxfa2kmS7jMMsCRJc8HHHGgXUi4vsR8ZaI2L2U8kbgF8AjjSykTBUPnA28tpewA/GrAb04GGDgcuDQil
mwp/ZKk+wkDLEnSrFdK+SvwUOBE4C4C7gqog4dhKz2Bm4sr6+bMBvdul8V0r5LvBjYJOppFeSdP81b6YIEnSKEop/wFeop/wFuAm6KiG8
Cx/T7WeN1b+vTRDcdx9RTJ0lSsgVLkjTrRcmSmEbFx46NtyBamvwDLNT7/dURsHhGLAE9eofP4F4LD6+sgBi/ls57uI2ARYF/je9
FMvSbo/McCSJM0Fy5L3RN0REd4AtgDOBi4EPtIZ5AI4E/gw8Cngl32W9VTgKhSRqVw7RLkiR
JUktswZIkSZKklhhgSZIkSVJLDLAkSZIkqSUGWJIkSZLUEgMsSZIkSWqJAZYkSZIkSJa8v8B4o1qc/oaa1YAAAAAS
UVORK5CYII=",
      "text/plain": [
       "<Figure size 864x576 with 1 Axes>"
      ]
     },
     "metadata": {
      "needs_background": "light"
     },
     "output_type": "display_data"
    }
   ],
   "source": [
    "# Group by studio and calculate the mean domestic gross and foreign gross\n",
    "avg_domestic_gross_by_studio = bom_mov_clean1.groupby('studio')
['domestic_gross'].mean().sort_values(ascending=False)\n",
    "avg_foreign_gross_by_studio = bom_mov_clean1.groupby('studio')
['foreign_gross'].mean().sort_values(ascending=False)\n",
    "\n",
    "\n",
    "# Select the top 50 studios\n",
    "top_30_studios = avg_domestic_gross_by_studio.head(50)\n",
    "top_30_studios_f = avg_foreign_gross_by_studio.head(50)\n",
    "# Plot the bar chart\n",
    "top_30_studios.plot(kind='bar', figsize=(12, 8))\n",
    "plt.title('Average Domestic Gross by Studio (Top 30 Studios)')\n",
    "plt.xlabel('Studio')\n",
    "plt.ylabel('Average Domestic Gross')\n",
    "plt.xticks(rotation=45, ha='right')  # Rotate x-axis labels for better readability\n",
    "plt.tight_layout()  # Adjust layout to prevent clipping of labels\n",
    "plt.show()\n",
    "\n",
    "\n",
    "top_30_studios_f.plot(kind='bar', figsize=(12,8))\n",
    "plt.title('Average Foreign Gross by Studio (Top 30 studios)')\n",
    "plt.xlabel('Studio')\n",
```

```
     "plt.ylabel('Average Foreign Gross')\n",
     "plt.xticks(rotation=45, ha='right')  # Rotate x-axis labels for better readability\n",
     "plt.tight_layout()  # Adjust layout to prevent clipping of labels\n",
     "plt.show()\n"
    ]
   },
   {
    "cell_type": "markdown",
    "metadata": {},
    "source": [
     "6. Top rated movies by Gross revenues"
    ]
   },
   {
    "cell_type": "code",
    "execution_count": 52,
    "metadata": {},
    "outputs": [
     {
      "name": "stderr",
      "output_type": "stream",
      "text": [
       "<ipython-input-52-be146240aa6c>:1: SettingWithCopyWarning: \n",
       "A value is trying to be set on a copy of a slice from a DataFrame.\n",
       "Try using .loc[row_indexer,col_indexer] = value instead\n",
       "\n",
       "See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy\n",
       "  bom_mov_clean1['total_gross'] = bom_mov_clean1['domestic_gross'] +
bom_mov_clean1['foreign_gross']\n"
      ]
     },
     {
      "data": {
       "text/html": [
        "<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>title</th>\n",
        "      <th>total_gross</th>\n",
        "    </tr>\n",
        "  </thead>\n",
        "  <tbody>\n",
        "    <tr>\n",
        "      <th>727</th>\n",
        "      <td>Marvel's The Avengers</td>\n",
        "      <td>1.518900e+09</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>1875</th>\n",
        "      <td>Avengers: Age of Ultron</td>\n",
        "      <td>1.405400e+09</td>\n",
        "    </tr>\n",
        "    <tr>\n",
```

```
        "      <th>3080</th>\n",
        "      <td>Black Panther</td>\n",
        "      <td>1.347000e+09</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>328</th>\n",
        "      <td>Harry Potter and the Deathly Hallows Part 2</td>\n",
        "      <td>1.341500e+09</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>2758</th>\n",
        "      <td>Star Wars: The Last Jedi</td>\n",
        "      <td>1.332600e+09</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>3081</th>\n",
        "      <td>Jurassic World: Fallen Kingdom</td>\n",
        "      <td>1.309500e+09</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>1127</th>\n",
        "      <td>Frozen</td>\n",
        "      <td>1.276400e+09</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>2759</th>\n",
        "      <td>Beauty and the Beast (2017)</td>\n",
        "      <td>1.263500e+09</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>3082</th>\n",
        "      <td>Incredibles 2</td>\n",
        "      <td>1.242800e+09</td>\n",
        "    </tr>\n",
        "    <tr>\n",
        "      <th>1128</th>\n",
        "      <td>Iron Man 3</td>\n",
        "      <td>1.214800e+09</td>\n",
        "    </tr>\n",
        "  </tbody>\n",
        "</table>\n",
        "</div>"
       ],
       "text/plain": [
        "                                                title   total_gross\n",
        "727                          Marvel's The Avengers  1.518900e+09\n",
        "1875                        Avengers: Age of Ultron  1.405400e+09\n",
        "3080                                  Black Panther  1.347000e+09\n",
        "328   Harry Potter and the Deathly Hallows Part 2  1.341500e+09\n",
        "2758                       Star Wars: The Last Jedi  1.332600e+09\n",
        "3081               Jurassic World: Fallen Kingdom  1.309500e+09\n",
        "1127                                       Frozen  1.276400e+09\n",
        "2759                   Beauty and the Beast (2017)  1.263500e+09\n",
        "3082                                 Incredibles 2  1.242800e+09\n",
        "1128                                    Iron Man 3  1.214800e+09"
       ]
      },
      "execution_count": 52,
      "metadata": {},
      "output_type": "execute_result"
     }
    ],
    "source": [
     "bom_mov_clean1['total_gross'] = bom_mov_clean1['domestic_gross'] +
bom_mov_clean1['foreign_gross']\n",
     "top_movies = bom_mov_clean1.sort_values(by='total_gross', ascending=False).head(10)\n",
     "top_movies[['title', 'total_gross']]"
    ]
   },
```

```
  {
   "cell_type": "markdown",
   "metadata": {},
   "source": [
    "Correlation Analysis"
   ]
  },
  {
   "cell_type": "code",
   "execution_count": 53,
   "metadata": {},
   "outputs": [
    {
     "data": {
      "image/png":
"iVBORw0KGgoAAAANSUhEUgAAAa0AAAEJCAYAAAAn23jPAAAAOXRFWHRTb2Z0d2FyZQBNYXRwbG90bGliIHZlcnNpb24zLjMuM
SwgaHR0cHM6Ly9tYXRwbG90bGliLm9yZy/d3fzzAAAACXBIWXMAAAsTAAALEwEAmpwYAAA28klEQVR4nO3deXwV1fnH8c83CaB
h38umKFIVraIiyk9UfnVDWlzaWrUuSFW0lda1irZV1LYudWldEf2piPsCFZeKSbiCyq5WCSNgCCcgkOT5/TEnYXJJbm7wQ
riX5/16zSt3Zs7MPHNzk+eeM2FOyMxwzjnnMkFOXQfgnHPOpcqTlnPOuYzhScs551zG8KTlnHMuMsYnrS
cqwVJ50ma+B22/6ekAemMaXuTtJukNZJy6zoWt/PxpOUyjqRfSJoc/nEuDomgd13HlUjSUElPxpeZZLmNmIbHOtxSSbbppITlf
wvLz0txxP19JOjZZGTP72swamVnpdwjZua3iSctlFElXAH8D/gK0BXYDHgBO3op6m8op6zd9aWYLIP8Bicp83vgcKA7cCDQE/hDbP33g
BbA7sCgsOxk4EWgGfAUMAIoAfYCDgKOBy83bEQe03Lp1Cv8sTvOTn8Drmq1DHjqIP9S6D9gA3HXzRbVC6LTk9O1H4F6q9Hh2gLM3o
DJpNq1kzVGP5bFgoPE6axUbSK1T4I8eGGsBk2TJiRfdBvzhw40DLGDm4tsAjtkcsr8S5o9cJOo3hgRwDeHxjHMEhgUXOvQZUqkSRR21S
eN0GWdXLYmgDcpbnvaKnhbH5PHYGC+M/FLvRlmHT3nKUjNS+h2fL7xbgC+dTb3M0+JgHSbvxwG6Rbo5n7MaLxCv1FqIWbQsY6GYy4MmpT
v+SSOMqM4fh5V/7HCi0/sujB56I+0x5NqgHIcchhZ3Ws4GEhOnq2oZqUdmbyQDDydDTDi7NnfbB8Cms8E7iXECDD/K6OP6iE3mS9xXQ
Z6s/YKdWO/hzBCCjPOrGMwgFqHUMYsMk8FS+bYhgk1Fq0P1VKKqVd0OSs8RcpjWT0SuLXGH/RYN3GzNSkTHfXvdd/RnVqSOgI10WKMMe
JGEoNT4o/AyL5YKXGTkX4csZHJxXmPnwXaYMRSb4IAQoJl7DkAfqBTwLiqMyDXXYT1Q7U/dj7+sM2cAanLLfh7bhhoBjMKrK+zGLQm1PwL
0XTwgNI/F5gOHpOMM72gUUf/hfwFULmAuc/LdQzO/JlMVu/xKpWhdMEs0KyU1IsT6wbkpk6mMC2NN1FktcfS1Kbhwf9
KIfNGvaOxxqHoKeH+YHmjnhyh0bYYxnuCSDp0HUT5X7Vcbki6uU/P3KUOe1MMxJ8cM1JqmB0YeZXOy0IVWKlQYkHDFpT3jbN/OD1XBbL0Q
QoaQH3SK8xSIh6xHv8ulX4HFUKoIoYcOy0Du/Ir3hWiSThVSTvBPvBHjt6Cx6rbLrPYMmn+93Otc1kRqoLNyuDTQH2qvRQd3o5xVhTkC
Q7DYNhpyPWuEvhj6BBJqMXSsPFO/ji+BF8yo2fLd1jjbWgb1PJ1DTfMrwMrnzP+OfQWuT+wE3/Q5cbAnUEVXH8j1+GCFZv3Ij/9hdaMsJD
eBcYmhfsFnhH4iiClbfYQkuZ1rl5t8bxwwFaH+xWTaqgkKpAm+P4VYfJtiSOYaOW+6DcVJPwIAvuDm9Ku/P+pOTUx5f4OFNt8+m5cmCmv
pDGR+ZIzNcVW9qX+D06DJZ7CS33DmEKHIoLXdH
```

JcnJy2LPD9/jjoDMrtr/uvhF88tkcVq5eQ7/B1zPoZydySp9edXU66ZeFzaCy6hrZywtIBwOPA4exuXnwIeAcYLCZvRdqH03N7
HJJ7xCa8iT1Ca9/HPb1DnAVsI6o2fAIMysMzXqNiZLHRjNbFe6QftzMukt6BbjLzN5O2M/8EE9F82B1tS1J9wNfm9ltko4nuqu
7NdAIeDXWxPcTojuy+wEtgMnh3BsAC8Nd4ZcBnYE/VRVvsvfztXp7+4WJbeiWvoljfLpt4Z83rK/rELJe4x59v3P1Z9kfBqb8/
6b1nx7LiOpWjTUtM5si6TlgKlGSeC+sGgAMC0NzzCUMkpgKM5st6Q/Am6G33iaimsp64LFYD77ymtjj4VjrgV6x/SwL14tGhW0
KiYYJqcqNwDOhY8W7RKMJryZKWnGjwzGmEdXirjazJZIGAL+TtAlYA5xLNCx/VfE651ydy6RegamqsaaVLSQ1AEpDTakX8GBNt
aJtwWta25bXtLYPr2lte+moaRUNvSDl/zcthz6SHTWtLLIb8HyoFW0ELqzjeJxzbptSFvYezLqkJWkgcGnC4n+b2SVE3fadc26
nkI1jJWRd0jKzx4DH6joO55yrcxnUlT1VWZe0nHPORbKxI4YnLeecy1KZdNNwqrIvDTvnnIsoJ/Upld1FY71+IWmOpCFVrG8ex
qKdHsaW3T+27qswRutUSZNjy1uEcWG/DD+bJ4vBk5ZzzmUp5eWmPNW4r2jM1fuBE4FuwJna8hFR1wFTzewAontZ/56w/n/NrLu
Z9YgtGwKMN7OuwPgwXy1PWs45l6UkpTyloCcwx8zmfTcT04o040o8WBmnwOdJbWtYb8nE41fS/h5SrLCnrSccy5b5eSkP
EkaJGlybBqUsLcOwILYfEFYjcN+AmApJ7A7kDHsM6IRkH6JGHfbc1sMUD42SbZKXlHDOecy1K16YhhZsOBZEPKVLWzxBE3bgX
+Hp7eMQP4FCgf6fkIM1skqQ0wTtLnZjYh5QADT1rOOZet0ntzcQHRo6XKdQQWxQuEx1cNhOhJ8MC8MGFmi8LPQkmjiZobJwBLJ
bUzs8WS2hGNIVstbx50zrkspdzclKcUTAK6StpDUn2ihwOPiReQ1CysA7iA6HmHqyQ1lNQ4lGkIHA/MDOXGEA3ATvj5crIgvKb
lnHPZKo33aYXBxgcTPdYpF3jUzGZJujisHwbsCzwhqRSYRDZwfNm8LjA4dPvKAp8PDeCFqUnxe0vnA18BpyeLwpOWcc1kq3SNim
NnrwOsJy4bFXn8MdkzX8pZOUVDr8EXzH3v9F+M3Sccy6ShaO
8e9Jyzrks5U8uds45lzm8puWccy5jeE3LOedcxvDeg8455zKG9x50zjmXMfyalnPOuYzh17Scc85lDL+m5ZxzLmP42IPOOecyR
k5KD3fMKJ60trNb+g6v6xCy2rVvDKrrEHYKKzvtX9chZL3GPfp+951kYU0r+87IOedcREp9ZkHV11wDtHmpF8IUXG3iOzBVlkK4ePQYtOelM7LjhD36W1y0H0iBVcbVGc0HmmM1jiR28G6YpGMPdtWpUqKVQM1ELuSjNGgf2dx8jGZCbRzcPgtiRQxJVHPnHYdIR9mtJ8HZgZsIJrJ6BRBpN
gr8BviUqGkw2oHUCHgJuMzMVoXFDwJdgO7AYuDOZOfk17Sccy5b1eKalpkNB5J1by4AOsXmOwKLEvaxChgIIEnAvDAhqR5Rwnr
KzEbFtllaEa70MPBqsji9puWcc1nKpJSnFEwCukraQ1J94AxgTLyApGZhHcAFwAQzWxUS2P8Bn5nZXQnbtIvNngrMTBaE17Scc
y5bpbH3oJmVSBoMjAVygfNbJaki8P6YcC+wBOSSoHZwPlh8yOAc4AzekQ4Dozex24XVJ3oqbgbr4CLksXhScs557JVmsceDEn
m9YRlw2KvPwC6VrHdRKq+JoaZnVObDxpeOedclrJcH8OHkzjnnMsU5knLOedcxvCnFjvnnMsU/ZmGc865TKEsvKblA+Ydc865jOE1Leecy1I+1jEwOIV13NN4ebevm0JPtxGb7NCEGN0RmAPrxl
lOYPwTSOedcxvDmQeecc5nCqr6fN50nLOuSzlHTGcc85lDk9azjnTTRCNjGM16eVTLbl
zLmN4Tcs551zmyMKOGNmXhp1zzgFQptyUp1V1RI6ivpC0lzJA2pYn1zSaMlSMlTZf0aWUX9GXUgtJ4Ryjy3nnMtSppyU1g1kJQLDAWOJhrNfZ6k2QnFLgNmm1k34HDgTkn1k2w7BBhvZl2B8WG+Wp60nHMuS5lyUp5ScCAwx8zmmdkmYBTQP/GQQGNJAhoBK4CSJNv2Bx4Prx8nekp6tTxpOedclrIcpTxJGiRpcmwalLC7DsCC2H5RKVoAAs4oOF7JX0aYJKSRWu/0Fk1taW3APFLGlwWPt2iH8UD3D6LjozsAhqmQrpucsxfV
5pIygXuB04EugFnPtNJ2EiegrRkbpW4s4KO+4QuVOPw6vvWsSMRxnXQc0xwK3eM3inYzJ1Tr2K4SaDJAz3JRdX8YSSEQ3tKJZE8rKCn4cJ7SuqiqfbkD5OI2Xn8oAOFnRSTHb6RdfuEqTSZ9XGUz5jYdQ72XYFN2gEfWNxqwKxq3m7S6s0uYHLFGxW7tuqHEdxkbpb05SFRMbtzzl7CbrEA3prbEWtq
Uto
yKGmQ0HhicpUtXOLGH+VuDvkqYCM4BPgZIUt02JJy3nnMtSFb6kvN6ugJ3InX2kw1KYC6NnoYjYB2B0UqdYSuiGJ6djxCMIgR0XvbLbl3X0YgKozdG4yXD0GHuuQrGxmbzwQtDLjQXdW0BvzTWoAP6BIgxGZbxQFRIxh1X0pO6VNNPAjJp0MiXM6wBp9YQDnfTsSmXSsdyqJyhI9p7jKkh9Qk4o4xK0NS0Jya3pDgtN6tRkJoFW9n6QTklL1VtBpDPRbh5MPp7A5KdwKpaIVpRvQXjw9wnhVvEC30ZQvE4RNd9tNhj3mxy8sCTK9S+zLDhCa0qNddafnqxgqcwvaFXdkKDfDPmq0fbnN6S8u+ypp1jTHDDwXK5b4YfHp5Pyz3bnDmADXEqOEpxzMQPGFkqEFmBBabxKSDtbqPpWUfBAiqvsWRhyrqOOqiD7MHnDe7O8YX1bH66s+t6K6iNyhbYW4X76bS3JV3mkNwrEi+RE4UZUMTuUFVxg3pp3H0HXZE9NuSsrXNLqrqQBDPSmHuHj1HbCC0E4DQ1PvXB96TALA4FtJfA6xWe5wQwxKEcEmB9s3TfO6RMTXtYhqfDZJrbb3iJqLYm2g3k4UsmRU7ARxBfpQ9MMLLpXRTgJYkdnE9dQVqACCkfhL1YYFuqUXoAvC0GMzzbnLJj8jgmjDxp0yGjFYtXvsGlrRVnM+A5IcgxDNb0bR7PzO5SUtk3xqETg0LXWHmvCWdb9xIdjPJjZGcqk6qG7bYJYehqiyzmbaSgbt9R9fy+WxYfbqwxvTMX9UBGPzQpQMZcLE2bM7Hs3HcUTIUTBxiQr7+x0NCLHM5KKbUxwE8bgJnaXG0Rc+tLzfexzGmqtz4k3YGktQk1jHf+nmUWjzqrrTKsbX4lgAx3zMBGuKZV6ZRt+dZfI2TdDSwfhOeMZB5z6RT4uVNvtOGkpK/vAqQMKIu2nyrGKWQPj0mb+4I6iH6KGcI9tunAVVXwjHv5ZVGEqA9ejXPVWQpUBmr9XlgX4vnXKNzBzpzF1cQMl4aHTGhqCI8uL6v9kbhvK+kT6ZLVlT0e2Uk5wG8TptM/t8hjWDLMqmnX2DWrCMBKjDnJrKbsGynsP5jGsFGRvzbhdxqAZsPg3dN7G/WPL9zRaZBd3t+bdPDGjNVGB8W7n2dW5y8ZVsI2zQbMeHGdBPiccO5DDePVFwbUckQSyTJ8iPzplX4W8rs7eOTA8xgT2eUdKpbBhYxbS7ix+L2PcZcNH0bOUNmY/GMEYKUzPExDFHrHGBWsZ3hSRZ+yl0ZZcrbBdOQWjVtvpWb4dl8M9o3ZO58Y9QChpY08CwhRKf9Lk3AvuaxOIHCiWnyWX4SXbbLDfvVxBkV+zbgvJdAp2e6gcjVLq3PhyCp2xpVF2vBtWDHj5sWGg7SaQwnJMMpKCrsIXHNdtjfnSn1C2oItKExIwDSzahBmeANOOGsASMMJfq2bsc6cjsvWYV5HkPnFHLU1WMwK6xDqJIJ2LUvXqR0zXNPfbTbCMxSCnyJzFtn+ThlRR4WmdQB8+3IjOqXt5BKrDYNzCmqOBgcN7aL73UsxnChpPwG4pq1Q6XKjMz+4zGsYdqvnCmOFOz+6Lh7pZSySSrdU5MHk4PGnQAcQrjyWT8c1pwPsEqU6z8i69vvn7xm5sIZ4Lv0VHzTWdvO3mhULUxf5rH6tOpr6PBZDkzGzGj4XDt4yx+DxxsiDuyWKgfFfL+93BNWoCIOpQZyG2m+W6e9nGNKh9v+S5ttAV3X2kqZnL4XYJsMySiwfC0ENzlO85IKyNzXvVpujYwwKfJi3DmeRSnOOO4T6gbVfp8UzuD3LY8pDeJfu4xSDpkcJsK5XX+jTNvXf3Y5hIqgVcvc1hXRb0pS+BqGFK4h

5vZonCcQkmjiZobJwBLJbUzs8WS2gGFyeL0mpZzzmWpNDcPTgK6StojdK44AxiTUOZr4BgASW2BvYG5khpKahyWNwSOB8qHVRk
DDAivBwAvJwvCa1rOOZelSkvTty8zK5E0GBgL5AKPmtksSReH9cOAm4HHJc0gak68xsyWS9oTGB31zyAPeNrM3gi7vhV4XtL5R
EnvtGRxeNJyzrksle6bi83sdeD1hGXDYq8XEdWiErebCxxYzT6LCLWzVHjScs65LJWNI2J40nLOuSzlD4F0zjmXMaxWVa3MGFz
Xk5ZzzmWpdHbE2FF40nLOuSzl17Scc85lDL+m5ZxzLmN4Tcs551zGsFpVtbwjhnPOuTrkzYPOOecyRmlp9mUtT1rOOZel/JqWc
865jOFJyznnXMYoy8Ks5UnLOeeyVMWD7rOIJy3nnMtStRt7MDN40nLOuSzlvQedc85ljGy8TyunrgNwzjm3bViZpTylQlJfSV9
ImiNpSBXrm0p6RdI0SbMkDQzLO0l6W9JnYfmlsW2GSlooaWqY+iWLwWtazjmXpdJ5SUtSLnA/cBxQAEySNMbMZseKXQLMNrP+k
loDX0h6CigBrjSzKZIaA59IGhfb9m4zuyOVODxp7cTen/YZd4wcRVlZGaf0OZzzTjqu0vpVa9dx0/CnKVi6nPr16nH9oDPZq1N
7AG4c/jQTP51F8yaNeP62a+si/IywS7fuNDvtl6Ac1r4/ntVvjq60Xrs2pMU5l5DX+nvYpo2sGHk/mxYvIK9Ne1qef0VFubxWb
fnm1WdZ8/Zr2/sUMt4BD/+FNv36sLGwiAkH9a/rcLarsvS2D/YE5pjZXABJzwInA/GkZUBjSQIaAcVAiZktBhYDmNlqSZ8BHRK
2TYk3D+6kSsvKuO3xF7jn6ot44fZrGfvBFOYWLKlU5rGXx/H93Trw7K1DuOlXZ3PnyFEV6/of2ZN7r754e4edWZRD89MvZNl9f
2bJzZeR36M3ed/rWKlIk74/ZVPBPJb++QqKR9wbJTigpHARS2+5KppuvRrbuIH10z6ui7PIeAUjRvHxjy+o6zDqRFmppTxJGiR
pcmwalLC7DsCC2HxBWBZ3H7AvsAiYAVxqVrnjvaTOwEHAR7HFgyVNl/SopObJzqnOkpakZpJ+XUOZzpJ+kcK+Okuamb7ost+s/
86nU9vWdGzTinp5eRx/+MG8+8mMSmXmLlxCz/2/D0Dn9m1ZtKyYom9WAXDwvnvRpFH+do87k9TvvBebli2htGgplJaw7pOJ7Hr
goZXK1GvXkW+/iN73kqULyWvZhpzGTSuVabDPDyhZvpTS4mXbLfZsUjxxMpuKv6nrMOpEmVnKk5kNN7MesWl4wu6qGgY+sSp3A
jAVaA90B+6T1KRiB1Ij4CXgMjNbFRY/CHQJ5RcDdyY7p7qsaTUDkiYtoDNQY9JKl9Bmu1MoLP6Gti2bVcy3adGMwhWV/7C/v1t
7/jVpOgAz/zufJctXULiT/vFvjdxmLShdsbxivnRFMblNW1Yqs6ngK/K7Hw5A/d33IrdFa3KbVS6Tf8gRrJs8cdsH7LKORckop
SkFBUCn2HxHohpV3EBglEXmAPOAfQAk1SNKWE+ZWUWzjZktNbPSUCN7mKgZslp1mbRuBbqE3iJ/DdNMSTMknR4rc2Qoc3moUb0
naUqY/ieVA0nKl/R8qH4+J+kjST3CujWSbpL0EdBL0hUhjpmSLgtlGkp6LfSImVken6RbJc0O+03pIuKOY8sPqRK+Rw3ofxyr1
67jF9feznNjJ7B35w7k5niLcupq/mK66s3R5OQ3pO21d9CoTz82FcyDstLNBXLz2PWAQ1k35f1tG6rLSmVllvKUgklAV0l7SKo
PnAGMSSjzNXAMgKS2wN7A3HCN6/+Az8zsrvgGktrFZk8Fkraa1WVHjCHA/mbWXdJPgYuBA4FWRL1SJoQyV5nZjyFKPsBxZvatp
K7AM0CPFI71a2CFmR0gaX+i6mu5hsBMM7te0iFE3xQOI/qP85Gkd4E9gUVm9qMQR1NJLYje4H3MzCQ1q+7goW14EMDfr/0NA3+
StEfndtGmRTOWFq2smC8sXknrZpWbpRrl78INF50FRN/YTrrsJtq3rlwLcNUrXVlEbvNWFfO5zVtQ+k1xpTL27XqKR95fMd/u5
gcpKSqsmN9lv4PYtGAuZau9hutqL529B82sRNJgYCyQCzxqZrMkXRzWDwNuBh6XNIPof+g1ZrZcUm/gHGCGpKlhl9eZ2evA7ZK
6E32j+wq4KFkcO0rvwd7AM2ZWCiwNieJQYFVCuXpEbaTdgVLg+7XY/98BzGympOmxdaVEVdbycqPNbC2ApFHAkcAbwB2SbgNeN
bP3JOUB3wKPSHoNeLW6g4e24eEAqye/sUPc7tdtz91YsGQZCwuLaNOiKW9+OIU/XXJupTKr165jlwb1qZeXxz/e/oCD9ulCo/x
d6ijizLNx/hzqtWlHbss2lK4sJv+Q3hQ99rdKZbRrPrZxI5SW0PCIY9kwZzb27fqK9Q179GbdJG8adFundk8uTmF/UZJ5PWHZs
NjrRcDxVWw3kWoejWxm59Qmhh0laaX6nOfLgaVENbIcoqTxXff/bUiW1ZYzs/+EWlg/4BZJb5rZTZJ6ElWFzwAGAz9MMZ46l5e
by+/O+ym/ue1BSsvKOOnow+nSsR0vvhX9g/zZsb2Zt2gpNzz4JDk5OezZ4Xv8cdCZFdtfd98IPvlsDitXr6Hf4OsZ9LMTOaVPr
7o6nR1TWRkrnnuE1oP/iHJyWPPBvyhZvICGR0Z/02vfe5N63+tIiwG/hbIyNi1ZQPHIByo2V736NNjnQIqffqiuziArdB95Jy2
P7kn9Vs354bx3+fKme1nw2It1HdZ2UVqafSPmqq4GVJTUEphiZrtL+glRlbAf0AKYTNRE1wG4y8yODtvcDRSY2Z3hTutHo5Y5d
SaqAe1fzbF+B+xpZr+S1A2YBvQys8mS1phZo1DuYOBx4HBC8yBRlXYpUByaJU8BzgPOBvLNrDA0Fc4xsxY1nfeOUtPKVisffbi
uQ9gpTH/YO+tuaz/a9EWqX+ardckdK1P+f3P/Vc2+8/G2hzqraZlZkaR/h67q/wSmEyUTA642syWSioASSdOIkskDwEuSTgPeB
tameLgHgBGhWfDTcKwtLhKEu7UfB8pviHnEzD6VdALwV0llwCbgV0Bj4GVJuxAluMtr/SY459w2lI1jD9Zp86CZJXZn/13C+k2
EnigxB8ReXxvKfQVUWcsKvgXODjWlLsB4YH7YtlHCMe8C7kpYNpbo4mOipF0znXOuLqX7mtaOYEe5prWt5QNvh/sEBPzKzDbWc
UzOObdN+fO0dnChGe+2hMXzzOxUUusa75xzWSPNYw/uELIqaSVpxnPOuZ1OWRb2HsyqpOWcc24zv6blnHMuY5T5NS3nnHOZwmt
azjnnMob3HnTOOZcxSku8I4ZzzrkM4TUt55xzGcPKvKblnHMuQ/jNxc455zJGNjYP+rPTnXMuS1mZpTylQlJfSV9ImiNpSBXrm
0p6RdI0SbPCI6SSbiuphaRxkr4MP5sni8GTlnPOZanS0tKUp5pIygXuB04EugFnhucTxl0CzDazA4E+wJ2S6tew7RBgvJl1JXo
CxxbJMM6TlnPOZak017R6Ej3sdm54SsazwMmJhwQaSxLQCCgGSmrY9mRgRHg9AjglWRCetJxzLkvVJmlJGiRpcmwalLC7DsCC2
HxBWBZ3H7AvsAiYAVxqZmU1bNvWzBYDhJ9tkp2Td8RwzrksVZuOGGY2HBiepIiq2ixh/gRgKvBDoAswTtJ7KW6bEq9pOedclio
rK0t5SkEB0Ck235GoRhU3EBhlkTnAPGCfGrZdKqkdQPhZmCwIT1rOOZel0nxNaxLQVdIekuoDZwBjEsp8DRwDIKktsDcwt4Ztx
wADwusBwMvJgvDmQeecy1JlKfQKTJWZlUgaTPSg3VzgUTObJenisH4YcDPwuKQZRE2C15jZcoCqtg27vhV4XtL5REnvtGRxeNJ
yzrksle5Hk5jZ68DrCcuGxV4vAo5PdduwvIhQO0uFJy3nnMtSZeZjDzrnnMsQ/hBI55xzGcNHeXfOOZcx0tkRY0fhScs557KUP
5rEOedcxvDmQeeccxnDO2I455zLGOZd3p1zzmWKbKxpKRsfx+zSR9KgMPqz20b8Pd4+/H3ODj5grqtJ4jN1XPr5e7x9+PucBTx
pOeecyxietJxzzmUMT1quJn4NYNvz93j78Pc5C3hHDOeccxnDa1rOOecyhict55xzGcOTlnPOuYzhSWsHJWmopKu28zHPk9Q+N
v+IpG7bM4a6IOm3kj6T9NR33M9JkoakK66dgaRmkn5dQ5nOkn6Rwr46S5qZvujcjsiTlos7D6hIWmZ2gZnNTvdBFNmRPnu/Bvq
Z2Vk1FZRU7dBnZjbGzG5Na2QpSBZTBmhG9P4n0xmoMWmli6Tc7XUsV3s70j+OnZ6k30v6QtJbwN5hWXdJH0qaLmm0pOZh+TuS7
pY0IdQSDpU0StKXkv4U2+fZkj6WNFXSQ5Jyw/S4pJmSZki6XNLPgB7AU6HsruEYPcJ++kqaImmapPFJzqG1pHGh7EOS5ktqFb4
FfybpAWAK0EnSX2MxnB62bxfOaWpYd2RV8abxPR8G7AmMkXSlpH+E9/pDSQeEMkMlDZf0JvBEOMeXJE0K0xGh3HmS7guvu4R9T
JJ0k6Q1YXmf8L6+KOlzSU9JUpL4+oVyEyXdI+nVamLaXdL4EPt4SbuFcqeF922apAlh2X6xz8R0SV3T9X5uhVuBLiGWv1b1mQh
ljgxlLg+fpffCZ2yKpP9J5UCS8iU9H875OUkfxT7fa8Lv6SOgl6QrQhwzJV0WyjSU9Fp4L2fGPrO3Spod9ntH2t8hV5mZ+bQDT
MAhwAwgH2gCzAGuAqYDR4cyNwF/C6/fAW4Lry8FFgHtgAZAAdAS2Bd4BagXyj0AnBuONS527GaxffaILX+HKJG1BhYAe4TlLZK
cx33AteF1X8CAVkTflsuAw8O6nwLjgFygLfB1iP9K4PehTC7QuLp40/jefxVivBe4ISz7ITA1vB4KfALsGuafBnqH17sBn4XX5
wH3hdevAmeG1xcDa8LrPsA3QEeiL40flO+rirh2SXjfnwFerSamV4AB4fUvgX+E1zOADgm/53uBs8Lr+uX7qKPPfWdgZg2fiT7
l5x3K5QO7hNddgcmJ+6rmWFcBD4XX+wMlhM97+Jz+POFvsSHQCJgFHBTiezi2v6ZAC+ALNt8+lNbPpk9bTl7T2nEcCYw2s3Vmt
goYQ/RH08zM3g1lRgBHxbYZE37OAGaZ2WIz2wDMBToBxxD9AU6SNDXM7xnW7ynpXkl9gVU1xHY4MMHM5gGYWXGSsr2BZ0O5N4A
VsXXzzezDWLlnzKzUzJYC7wKHApOAgZKGAj8ws9vBEe/W6g2MDLH/C2gpqWlYN8bM1ofXxwL3hfd0DNBEUuOEffUCXgivn05Y9
7GZFVj03IipRP9sq7IPMLf8fSdKWnHxmHrFjjMynAvAv4HHJV1IlAwgSpTXSboG2D22j7pW3WciUT3gYUkziN7jVK+7xj+bM4m
+EJYrBV6KlRttZmvNbA0wiujvcwZwrKTbJB1pZt8QfRa/BR6R9BNgXeqn67aGJ60dS23v9N4QfpbFXpfP5wECRphZ9zDtbWZDz
WwFcCBRTeoS4JEajqNaxFZtUxewtqZyZjaBKDEvBEZKOncr4t1aVcVUft7x2HOAXrH3tUNIrqmK/65Kqf4RQcney8SYEkXVB7O
LgT8QfYmZKqmlmT0NnASsB8ZK+mVuvcBpUSfiR5EtcXvuv9vzaw0WTkz+w+ba2G3SLrezEqAnkQJ7xTgjRRjcVvJk
9aOYwJwqqJrSY2B/kT/lFZIOjKUOYfo22eqxgM/k9QGQFKLcO2jFZBjZi8BfwQODuVXEzXHJfoAOFrSHuX7SXLMicDPQ7njgeb
VlJsAnB6uV7UmSlQfS9odKDSzh4H/Aw5OEm+6TQDOCrH3AZaHWm+iN4HB5TOSuldR5kOi5iSAM7Yyns+Japidw/zpScq+HzvOW
US/ByR1MbOPzOx6YDnRtcQ9iWpw9xDVFA/YyvjSIf6Zq/IzwZafy6bA4lBTPYfNNciaxD+b3YAfVFNuAnBKuAbWEDgVeE9Rz9p
1ZvYkcAfRZ7MR0NTMXgcuA7qnGIvbSpnc6yirmNkUSc8RNRfNB94LqwYAwyTlEzWTDazFPmdL+gPwpqLeepuIairrgce0uQfft
eHn4+FY64mam8r3s0zSIGBU2KYQOK6aw94IPBMuUr8LLCb6p9MoodzocIxpRLWCq81siaQBwO8kbQLWEF2D61BNvOk2NBxnOlE
zz4Bqyv0WuD+UyyP6J3dxQpnLgCclXQm8RnQdq1bMbL2i7uBvSFpO9A+8Or8FHpX0O2AZmz8nfw0dLUT0JWYaMAQ4O7zHS4iul
dYJMyuS9G9FXdX/SdRkl/iZKAJKJE0j+ow+ALwk6TTgbZLXOOMeAEaE39un4Vhb/F7C3+LjbH6/HzGzTyWdQPR+lhH9Lf2KKJm
+LGkXovc4bZ2EXNV87EGXVpIaAKVmViKpF/CgmXWv47C2u/AlY72ZmaQziDplnLwV+2lkZmskCbgf+NLM7k53vDsDRV3Z65nZt
5K6ECXx75vZxjoOzdWC17Rcuu0GPB9qRRuBC+s4nrpyCFFnDQEriXr0bY0LQ+2zPlHt4KH0hLdTygfellSPqFb0K09YmcdrWm6

```
rSBpI1NU+7t9mdkldxJPpJI0G9khYfI2Zja2LeDJZaMa7LWHxPDM7tS7icenlScs551zG8N6DzjnnMoYnLeeccxnDk5ZzzrmM4
UnLOedcxvh/DtvjSysOWYMAAAAASUVORK5CYII=",
      "text/plain": [
       "<Figure size 432x288 with 2 Axes>"
      ]
     },
     "metadata": {
      "needs_background": "light"
     },
     "output_type": "display_data"
    }
   ],
   "source": [
    "correlation_matrix = bom_mov_clean1[['domestic_gross', 'foreign_gross',
'total_gross']].corr()\n",
    "sns.heatmap(correlation_matrix, annot=True, cmap='coolwarm')\n",
    "plt.title('Correlation Matrix')\n",
    "plt.show()"
   ]
  }
 ],
 "metadata": {
  "kernelspec": {
   "display_name": "learn-env",
   "language": "python",
   "name": "python3"
  },
  "language_info": {
   "codemirror_mode": {
    "name": "ipython",
    "version": 3
   },
   "file_extension": ".py",
   "mimetype": "text/x-python",
   "name": "python",
   "nbconvert_exporter": "python",
   "pygments_lexer": "ipython3",
   "version": "3.8.5"
  }
 },
 "nbformat": 4,
 "nbformat_minor": 2
}
```