In [1]:
```
# suggested libraries
def configure_plotly_browser_state():
  import IPython
  display(IPython.core.display.HTML('''
        <script src="/static/components/requirejs/require.js"></script>
        <script>
          requirejs.config({
            paths: {
              base: '/static/base',
              plotly: 'https://cdn.plot.ly/plotly-1.5.1.min.js?noext',
            },
          });
        </script>
        '''))
import chart_studio.plotly as py
import numpy as np
from plotly.offline import init_notebook_mode, iplot
from plotly.graph_objs import Contours, Histogram2dContour, Marker, Scatter
import plotly.graph_objs as go

configure_plotly_browser_state()
init_notebook_mode(connected=False)
import pandas as pd
import plotly.express as px
import matplotlib.pyplot as plt
```

The Team

Kevin Farragher

Role:

Answered the following questions that our group sought to get answers to, using exploratory data analysis and visualization (if applicable):

- Which 5 years had the highest and lowest median age for males getting married between 1991 and 2015?
- Which 5 years had the highest and lowest median age for females getting married between 1991 and 2015?
- From 1991 to 2015, how many years was the median age for men getting married greater than the median age for women getting married?
- How did the median age for males and females getting married change from 1991 to 2015?
- From 1991 to 2015, how many years was the number of men marrying per 1,000 unmarried men greater than the number of women marrying per 1,000 unmarried women?
- How did the number of men and marrying per 1,000 unmarried men and number of women marrying per 1,000 unmarried women change from 1991 to 2015?
- From 1991 to 2015, how many years was the number of men marrying for the first time per 1,000 people greater than number of women marrying for the first time per 1,000 people?
- How did the number of men marrying for the first time per 1,000 people and number of women marrying for the first time per 1,000 people change from 1991 to 2015?
- From 1991 to 2015, how many years was the number of men remarrying per 1,000 people greater than the number of women remarrying per 1,000 people?
- How did the number of men remarrying per 1,000 people and number of women remarrying per 1,000 people change from 1991 to 2015?
- From 1991 to 2015, how many years was the number of men marrying for the first time per 1,000 people greater than the number of men remarrying per 1,000 people?
- From 1991 to 2015, how many years was the number of women marrying for the first time per 1,000 people greater than the number of women remarrying per 1,000 people?

Also, I was the perosn who combined our notebooks together and put together our final notebook with the required sections.

Mark Beebe

Role:

Answered the following questions that our group sought to get answers to, using exploratory data analysis and visualization (if applicable):

- From 1991 to 2015, how many years did husbands file for divorce more than wives?
- How did the number of divorces filed by husbands and wives change from 1991 to 2015?
- Between 1991 and 2015, were husbands more likely to divorce because of adultery, or because of unreasonable behavior?
- Between 1991 and 2015, were wives more likely to divorce because of adultery, or because of unreasonable behavior?

- Between 1991 and 1995, how did the causes of divorce (filing for divorce because of adultery and filing for divorce because of unreasonable behavior) change over time? ### Jayson Brown #### Role: Answered the following questions that our group sought to get answers to, using exploratory data analysis and visualization (if applicable):
- Which 5 years had the highest and lowest number of marriages between 1991 and 2015?
- Which 5 years had the highest and lowest number of divorces between 1991 and 2015?
- How did the number of divorces and marriages change from 1991 to 2015?
- Between 1991 and 2015, how many marriages consisted of people who both married for the first time, a person who previously divorced, people who both previously divorced, the husband previously divorcing, and the wife previously divorcing?
- How did the number of marriages consisting of people who both married for the first time, a person who previously divorced, people who both previously divorced, the husband previously divorcing, and the wife previously divorcing change from 1991 to 2015? ### Eric D'Alessandro #### Role: Answered the following questions that our group sought to get answers to, using exploratory data analysis and visualization (if applicable):
- Between 1991 and 2015, which age group between ages 20-59 had the highest/lowest average divorce rate for males?
- Between 1991 and 2015, which age group between ages 20-59 had the highest/lowest average divorce rate for females?
- How did the divorce rate for males aged 20-24, males aged 25-29, males aged 30-34, males aged 35-39, males aged 40-44, males aged 45-49, males aged 50-54, and males aged 55-59 change from 1991 to 2015?
- How did the divorce rate for females aged 20-24, females aged 25-29, females aged 30-34, females aged 35-39, females aged 40-44, females aged 45-49, females aged 50-54, and females aged 55-59 change from 1991 to 2015?
- Between 1991 and 2015, was the divorce rates for different age ranges significantly different? Has the divorce rate for different ranges changed since 1991? Which age groups were most likely to divorce?
- Between 1991 and 2015, which age group had the highest divorce rate per year?

Analyzing UK Marriage and Divorce Data

Problem Statement and Background

A high-level statement of the problem you intend to address, e.g. finding correspondences between geo locations and crime rates. Translate the high-level description into specific questions. Give background on the problem you are solving: why it is interesting, who is interested, what is known, some references about it, etc.

The problem we intend to address is trying to find interesting statistics and relationships between the attributes from our dataset, which contains data on UK divorce and marriage, and visualizing them with graphs. The problem we intend to address is important because by finding interesting statistics and relationships between the attributes from our dataset, which contains data on UK marriage and divorce, we can gather insights on UK marriage and divorce and find out about information relating to UK marriage and divorce that may not be obvious or known to people.

The Data Source

Describe the data source(s) you used. Describe how you accessed the data. Give a summary of the cleaning/joining of data that you had to do up front. Provide links and references to your data source.

Our dataset contains information about divorce and marriage in the United Kingdom from 1901 to 2016. The dataset was retrieved from Kaggle (https://www.kaggle.com/osbornep/uk-marriage-and-divorce-figures (https://www.kaggle.com/osbornep/uk-marriage-and-divorce-figures)). The data in the dataset related to UK marriage was gathered from https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/marriagecohabitationandcivilpa (https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/marriagecohabitationandcivilpa and the data in the dataset related to UK divorce was gathered from https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/divorce/datasets/divorcesineng (https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/divorce/datasets/divorcesinenc Specifically, the dataset contains annual information (relating to divorce and marriage in the UK from 1901 to 2016) on the:

- number of divorces
- number of husbands who submitted for divorce
- number of wives who submitted for divorce
- divorce rate for males of various age groups
- divorce rate for females of various age groups
- number of husbands who submitted for divorce because of adultery and unreasonable behavior
- number of wives who submitted for divorce because of adultery and unreasonable behavior
- number of marriages
- number of marriages that consisted of people who both married for the first time
- number of marriages that consisted of a person who previously divorced
- number of marriages that consisted of people who both previously divorced
- number of marriages that consisted of the husband previously divorcing
- number of marriages that consisted of the wife previously divorcing
- median age of males getting married
- median age of females getting married
- number of people marrying per 1,000 people
- number of men marrying per 1,000 unmarried men
- number of women marrying per 1,000 unmarried women
- number of men marrying for the first time per 1,000 people
- number of women marrying for the first time per 1,000 people
- number of men remarrying per 1,000 people
- number of women remarrying per 1,000 people

In [2]:
```
#loading in and showing head of thedataset
uk_divorce_marriage_df = pd.read_csv("UKDivorceAndMarriage.csv")
uk_divorce_marriage_df.head()
```

Out[2]:

	Year	Total Number of Divorces	Husband Submitted Divorce	Wife Submitted Divorce	DRMale 20 to 24	DRMale 25 to 29	DRMale 30 to 34	DRMale 35 to 39	DRMale 40 to 44	D
0	2016	106,959	41,669	65,290	9.4	13.2	13.0	13.4	13.6	13
1	2015	101,055	38,490	62,565	10.5	13.0	11.9	12.6	13.1	12
2	2014	111,169	41,364	69,803	13.2	13.5	14.0	13.9	14.6	13
3	2013	114,720	40,635	74,076	14.7	15.9	15.8	16.7	16.7	15
4	2012	118,140	41,601	76,490	17.5	17.4	17.3	17.9	17.8	15

5 rows × 39 columns

Dataset Cleaning

When the dataset was initially inspected, we found that the dataset had many years (entries/rows) with null values, and the data types of some of the columns/attributes in the dataset were improper. As a result, we decided to clean up the original dataset by removing the years with null values and changing the data types of columns with improper data types to proper ones. From these changes, we will be analyzing divorce and marriage data in the UK from 1991 to 2015, which we feel is still a large enough chunk of the dataset to gather valuable insights from.

In [3]:
```
#removing years (entries/rows) with null/empty values from the dataset
uk_divorce_marriage_df=uk_divorce_marriage_df.iloc[1:26,:]
uk_divorce_marriage_df
```

Out[3]:

	Year	Total Number of Divorces	Husband Submitted Divorce	Wife Submitted Divorce	DRMale 20 to 24	DRMale 25 to 29	DRMale 30 to 34	DRMale 35 to 39	DRMale 40 to 44	I
1	2015	101,055	38,490	62,565	10.5	13.0	11.9	12.6	13.1	1
2	2014	111,169	41,364	69,803	13.2	13.5	14.0	13.9	14.6	1
3	2013	114,720	40,635	74,076	14.7	15.9	15.8	16.7	16.7	1
4	2012	118,140	41,601	76,490	17.5	17.4	17.3	17.9	17.8	1
5	2011	117,558	40,414	77,083	19.5	17.1	18.8	17.9	18.0	1
6	2010	119,589	40,338	79,178	15.5	17.8	17.7	19.3	17.9	1
7	2009	113,949	38,043	75,834	14.2	18.2	17.4	17.6	16.4	1
8	2008	121,708	40,143	81,466	14.0	17.7	18.5	19.1	17.8	1
9	2007	128,131	40,878	87,151	16.6	19.5	20.1	20.1	18.8	1
10	2006	132,140	41,638	90,375	20.0	21.0	20.8	20.7	19.5	1
11	2005	141,322	44,537	96,644	23.3	23.7	22.9	22.2	20.7	1
12	2004	152,923	47,580	105,177	21.8	26.2	26.2	25.2	22.5	1
13	2003	153,065	46,883	106,013	30.5	26.5	27.7	25.5	22.2	1
14	2002	147,735	44,771	102,796	19.8	27.5	27.5	24.1	20.6	1
15	2001	143,818	44,480	99,140	21.6	27.9	28.3	25.0	20.5	1
16	2000	141,135	42,452	98,438	23.9	27.9	27.4	24.1	19.5	1
17	1999	144,556	43,539	100,664	25.9	29.7	28.4	24.2	19.5	1
18	1998	145,214	43,053	101,795	27.4	30.7	28.4	24.0	18.9	1
19	1997	146,689	43,889	102,373	27.5	30.4	28.7	23.6	18.6	1
20	1996	157,107	46,884	109,732	29.4	32.6	30.2	24.8	19.4	1
21	1995	155,499	45,985	109,023	29.0	31.5	29.6	24.1	19.0	1
22	1994	158,175	45,112	112,640	29.0	31.5	29.9	24.3	19.1	1
23	1993	165,018	46,271	118,401	29.2	33.0	30.8	25.1	19.7	1
24	1992	160,385	44,378	115,628	26.6	32.1	29.5	23.6	18.7	1
25	1991	158,745	44,160	114,192	26.7	32.4	28.6	23.1	17.7	1

25 rows × 39 columns

In [4]:
```
#converting the data type of columns with object data types to int
uk_divorce_marriage_df['Total Number of Divorces'] = uk_divorce_marriage_df['T
otal Number of Divorces'].astype(str)
uk_divorce_marriage_df['Total Number of Divorces'] = uk_divorce_marriage_df['T
otal Number of Divorces'].str.replace(',', '').astype(int)
uk_divorce_marriage_df['Husband Submitted Divorce'] = uk_divorce_marriage_df[
'Husband Submitted Divorce'].astype(str)
uk_divorce_marriage_df['Husband Submitted Divorce'] = uk_divorce_marriage_df[
'Husband Submitted Divorce'].str.replace(',', '').astype(int)
uk_divorce_marriage_df['Wife Submitted Divorce'] = uk_divorce_marriage_df['Wif
e Submitted Divorce'].astype(str)
uk_divorce_marriage_df['Wife Submitted Divorce'] = uk_divorce_marriage_df['Wif
e Submitted Divorce'].str.replace(',', '').astype(int)
uk_divorce_marriage_df['Total Number of Marriages'] = uk_divorce_marriage_df[
'Total Number of Marriages'].astype(str)
uk_divorce_marriage_df['Total Number of Marriages'] = uk_divorce_marriage_df[
'Total Number of Marriages'].str.replace(',', '').astype(int)
uk_divorce_marriage_df['First marriage of both parties'] = uk_divorce_marriage
_df['First marriage of both parties'].astype(str)
uk_divorce_marriage_df['First marriage of both parties'] = uk_divorce_marriage
_df['First marriage of both parties'].str.replace(',', '').astype(int)
uk_divorce_marriage_df['One party previously divorced'] = uk_divorce_marriage_
df['One party previously divorced'].astype(str)
uk_divorce_marriage_df['One party previously divorced'] = uk_divorce_marriage_
df['One party previously divorced'].str.replace(',', '').astype(int)
uk_divorce_marriage_df['Both parties previously divorced'] = uk_divorce_marria
ge_df['Both parties previously divorced'].astype(str)
uk_divorce_marriage_df['Both parties previously divorced'] = uk_divorce_marria
ge_df['Both parties previously divorced'].str.replace(',', '').astype(int)
uk_divorce_marriage_df['Husband - Previously Divorced'] = uk_divorce_marriage_
df['Husband - Previously Divorced'].astype(str)
uk_divorce_marriage_df['Husband - Previously Divorced'] = uk_divorce_marriage_
df['Husband - Previously Divorced'].str.replace(',', '').astype(int)
uk_divorce_marriage_df['Wife - Previously Divorced'] = uk_divorce_marriage_df[
'Wife - Previously Divorced'].astype(str)
uk_divorce_marriage_df['Wife - Previously Divorced'] = uk_divorce_marriage_df[
'Wife - Previously Divorced'].str.replace(',', '').astype(int)
#converting the data type of the "Year" column to object
uk_divorce_marriage_df['Year'] = uk_divorce_marriage_df['Year'].astype(object)
```

Goal of our Analysis

List the goal of your analysis, ideally in the form of testable hypothesis, or via well-defined success metrics. You initial hypotheses may have changed throughout your project, but you should always approach the data with some expectations so that your efforts are focused.

The goal of our analysis is to find answers to the following questions:

- Which 5 years had the highest and lowest number of marriages between 1991 and 2015?
- Which 5 years had the highest and lowest number of divorces between 1991 and 2015?
- How did the number of divorces and marriages change from 1991 to 2015?
- From 1991 to 2015, how many years did husbands file for divorce more than wives?
- How did the number of divorces filed by husbands and wives change from 1991 to 2015?
- Between 1991 and 2015, which age group between ages 20-59 had the highest/lowest average divorce rate for males?
- Between 1991 and 2015, which age group between ages 20-59 had the highest/lowest average divorce rate for females?
- How did the divorce rate for males aged 20-24, males aged 25-29, males aged 30-34, males aged 35-39, males aged 40-44, males aged 45-49, males aged 50-54, and males aged 55-59 change from 1991 to 2015?
- How did the divorce rate for females aged 20-24, females aged 25-29, females aged 30-34, females aged 35-39, females aged 40-44, females aged 45-49, females aged 50-54, and females aged 55-59 change from 1991 to 2015?
- Between 1991 and 2015, was the divorce rates for different age ranges significantly different? Has the divorce rate for different ranges changed since 1991? Which age groups were most likely to divorce?
- Between 1991 and 2015, which age group had the highest divorce rate per year?
- Between 1991 and 2015, were husbands more likely to divorce because of adultery, or because of unreasonable behavior?
- Between 1991 and 2015, were wives more likely to divorce because of adultery, or because of unreasonable behavior?
- Between 1991 and 1995, how did the causes of divorce (filing for divorce because of adultery and filing for divorce because of unreasonable behavior) change over time?
- Between 1991 and 2015, how many marriages consisted of people who both married for the first time, a person who previously divorced, people who both previously divorced, the husband previously divorcing, and the wife previously divorcing?
- How did the number of marriages consisting of people who both married for the first time, a person who previously divorced, people who both previously divorced, the husband previously divorcing, and the wife previously divorcing change from 1991 to 2015?
- Which 5 years had the highest and lowest median age for males getting married between 1991 and 2015?
- Which 5 years had the highest and lowest median age for females getting married between 1991 and 2015?
- From 1991 to 2015, how many years was the median age for men getting married greater than the median age for women getting married?
- How did the median age for males and females getting married change from 1991 to 2015?
- From 1991 to 2015, how many years was the number of men marrying per 1,000 unmarried men greater than the number of women marrying per 1,000 unmarried women?

- How did the number of men and marrying per 1,000 unmarried men and number of women marrying per 1,000 unmarried women change from 1991 to 2015?
- From 1991 to 2015, how many years was the number of men marrying for the first time per 1,000 people greater than number of women marrying for the first time per 1,000 people?
- How did the number of men marrying for the first time per 1,000 people and number of women marrying for the first time per 1,000 people change from 1991 to 2015?
- From 1991 to 2015, how many years was the number of men remarrying per 1,000 people greater than the number of women remarrying per 1,000 people?
- How did the number of men remarrying per 1,000 people and number of women remarrying per 1,000 people change from 1991 to 2015?
- From 1991 to 2015, how many years was the number of men marrying for the first time per 1,000 people greater than the number of men remarrying per 1,000 people?
- From 1991 to 2015, how many years was the number of women marrying for the first time per 1,000 people greater than the number of women remarrying per 1,000 people?

Data Analysis

Describe the tools you used throughout the project. Most likely, you project included several stages in the project such as exploratory data analysis, modeling (using machine learning), and possibly a scale-up from a sample of data to the full dataset. Describe all stages of your project.

The tools we used throughout the project to find the answers to our questions relating to UK divorce and marriage include exploratory data analysis and visualization. Exploratory data analysis was used to perform data wrangling and to find the answers to our questions relating to UK divorce and marriage. Visualization was used to to visualize the answers to our questions relating to UK divorce and marriage (if applicable) by using a variety of graphs and plots, such as bar graphs and line graphs. Initially, our project focused on exploratory data analysis to find the answers to our questions relating to UK divorce and marriage. Once the answers to our questions were found, our project focused on visualizing the answers to our questions (if applicable) by using a variety of graphs.

Results/Findings

In [5]:
```
#dataset's columns
uk_divorce_marriage_df.columns
```

Out[5]:
```
Index(['Year', 'Total Number of Divorces', 'Husband Submitted Divorce',
       'Wife Submitted Divorce', 'DRMale 20 to 24', 'DRMale 25 to 29',
       'DRMale 30 to 34', 'DRMale 35 to 39', 'DRMale 40 to 44',
       'DRMale 45 to 49', 'DRMale 50 to 54', 'DRMale 55 to 59',
       'DRFemale 20 to 24', 'DRFemale 25 to 29', 'DRFemale 30 to 34',
       'DRFemale 35 to 39', 'DRFemale 40 to 44', 'DRFemale 45 to 49',
       'DRFemale 50 to 54', 'DRFemale 55 to 59',
       'Husband Submitted - Reason Adultery',
       'Husband Submitted - Reason Unreasonable Behaviour',
       'Wife Submitted - Reason Adultery',
       'Wife Submitted - Reason Unreasonable Behaviour',
       'Total Number of Marriages', 'First marriage of both parties',
       'One party previously divorced', 'Both parties previously divorced',
       'Husband - Previously Divorced', 'Wife - Previously Divorced',
       'Median Age of Single Males Marriage',
       'Median Age of Single Females Marriage',
       'Persons marrying per 1,000 population of all ages',
       'Men marrying per 1,000 unmarried1 men aged 16 and over',
       'Women marrying per 1,000 unmarried1 women aged 16 and over',
       'Number Men First Time marrying per 1,000 single population aged 16 an
d over',
       'Number Women First Time marrying per 1,000 single population aged 16
and over',
       'Number Men Re-marrying per 1,000 single population aged 16 and over',
       'Number Women Re-marrying per 1,000 single population aged 16 and ove
r'],
      dtype='object')
```

Which 5 years had the highest and lowest number of marriages between 1991 and 2015?

The tables below show the 5 years with the highest and lowest number of marriages between 1991 and 2015. Between 1991 and 2015, the 5 years with the highest number of marriages were 1992, 1991, 1993, 1994, and 1995. The 5 years with the lowest number of marriages were 2009, 2007, 2008, 2015, and 2006. Over time, marriage became less frequent.

In [6]:
```
top5_years_marriages=uk_divorce_marriage_df[['Year','Total Number of Marriages']].sort_values('Total Number of Marriages', ascending=False).head(5)
top5_years_marriages
```

Out[6]:

	Year	Total Number of Marriages
24	1992	311564
25	1991	306756
23	1993	299197
22	1994	291069
21	1995	283012

In [7]:
```
bottom5_years_marriages=uk_divorce_marriage_df[['Year','Total Number of Marriages']].sort_values('Total Number of Marriages', ascending=True).head(5)
bottom5_years_marriages
```

Out[7]:

	Year	Total Number of Marriages
7	2009	232443
9	2007	235367
8	2008	235794
1	2015	239020
10	2006	239454

Which 5 years had the highest and lowest number of divorces between 1991 and 2015?

The tables below show the 5 years with the highest and lowest number of divorces between 1991 and 2015. Between 1991 and 2015, the 5 years with the highest number of divorces were 1993, 1992, 1991, 1994, and 1996. The 5 years with the lowest number of divorces were 2015, 2014, 2009, 2013, and 2011. Over time, divorces became less frequent.

In [8]:
```
top5_years_divorces=uk_divorce_marriage_df[['Year','Total Number of Divorces'
]].sort_values('Total Number of Divorces', ascending=False).head(5)
top5_years_divorces
```

Out[8]:

	Year	Total Number of Divorces
23	1993	165018
24	1992	160385
25	1991	158745
22	1994	158175
20	1996	157107

In [9]:
```
bottom5_years_divorces=uk_divorce_marriage_df[['Year','Total Number of Divorce
s']].sort_values('Total Number of Divorces', ascending=True).head(5)
bottom5_years_divorces
```

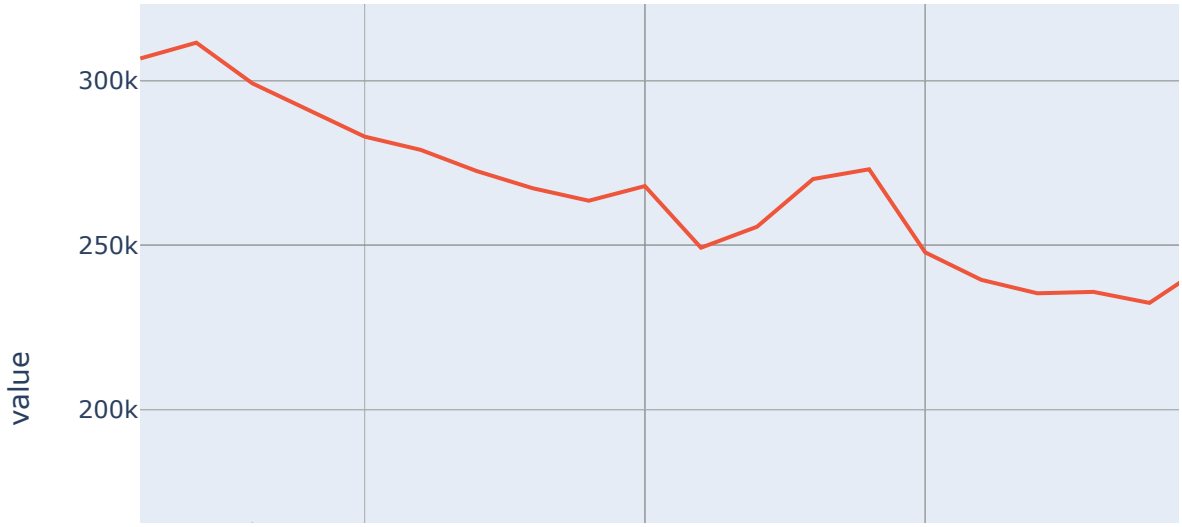
Out[9]:

	Year	Total Number of Divorces
1	2015	101055
2	2014	111169
7	2009	113949
3	2013	114720
5	2011	117558

How did the number of divorces and marriages change from 1991 to 2015?

The line graph below visualizes how the number of divorces and marriages changed from 1991 and to 2015. From 1991 to 2015, the number of marriages and divorces decreased. Marriage and divorce became less common over the years.

In [10]:
```
uk_divorce_marriage_df_long=pd.melt(uk_divorce_marriage_df, id_vars=['Year'],
value_vars=['Total Number of Divorces', 'Total Number of Marriages'])
fig = px.line(uk_divorce_marriage_df_long, x='Year', y='value', color='variabl
e')
fig.show()
```



From 1991 to 2015, how many years did husbands file for divorce more than wives?

The code below was used to determine the number of years husbands filed for divorce more than wives from 1991 to 2015. From 1991 to 2015, the number of years husbands filed for divorce more than wives was 0. Every year, husbands filed for divorce less than wives, showing that wives were more likely to file for divorce than husbands.

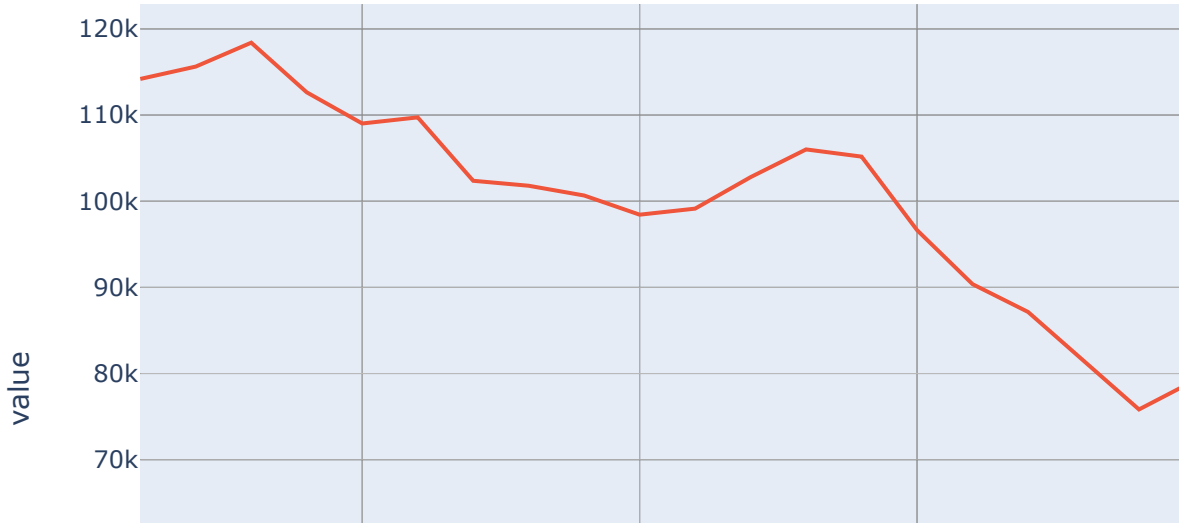
In [11]:
```
years=0
for i in range(1,uk_divorce_marriage_df.shape[0]+1):
    num_husbands_filed_divorce=uk_divorce_marriage_df.loc[i,'Husband Submitted
Divorce']
    num_wives_filed_divorce=uk_divorce_marriage_df.loc[i,'Wife Submitted Divor
ce']
    if(num_husbands_filed_divorce>num_wives_filed_divorce):
        years=years+1
print("The number of years husbands filed for divorce more than women:",years)
```

```
The number of years husbands filed for divorce more than women: 0
```

How did the number of divorces filed by husbands and wives change from 1991 to 2015?

The line graph below visualizes how the number of divorces being filed by husbands and wives changed from 1991 and to 2015. From 1991 to 2015, the number divorces filed by wives decreased, while the number of divorces filed by husbands remained constant. Wives filed for divorce less often over the years, and men filed for divorce at the same rate over the years. Overall, wives submitted for divorce at a significantly higher rate than husbands. However, over the years, the gap between the number of wives filing for divorce and the number of husbands filing for divorce decreased from about three times as much to two times as much.

In [12]:
```
uk_filed_divorce_df_long=pd.melt(uk_divorce_marriage_df, id_vars=['Year'], val
ue_vars=['Husband Submitted Divorce', 'Wife Submitted Divorce'])
fig = px.line(uk_filed_divorce_df_long, x='Year', y='value', color='variable')
fig.show()
```



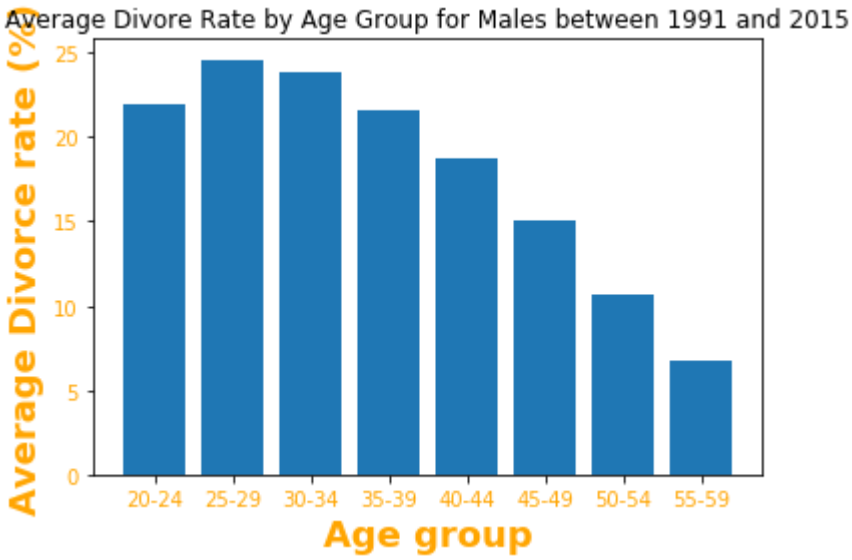
Between 1991 and 2015, which age group between ages 20-59 had the highest/lowest average divorce rate for males?

The code below was used to determine which age group between ages 20-59 had the highest/lowest average divorce rate for males between 1991 and 2015. Between 1991 and 2015, the age group between ages 20-59 with the highest average divorce rate for males was males aged 25-29, and the age group between ages 20-59 with the lowest average divorce rate for males was males aged 55-59. As males aged, they were less likely to divorce. The bar plot visualizes the average divorce rate by age group for males between 1991 and 2015.

In [13]:
```
print("Divorce rate for males ages 20-24:",uk_divorce_marriage_df['DRMale 20 t
o 24'].mean())
print("Divorce rate for males ages 25-29:",uk_divorce_marriage_df['DRMale 25 t
o 29'].mean())
print("Divorce rate for males ages 30-34:",uk_divorce_marriage_df['DRMale 30 t
o 34'].mean())
print("Divorce rate for males ages 35-39:",uk_divorce_marriage_df['DRMale 35 t
o 39'].mean())
print("Divorce rate for males ages 40-44:",uk_divorce_marriage_df['DRMale 40 t
o 44'].mean())
print("Divorce rate for males ages 45-49:",uk_divorce_marriage_df['DRMale 45 t
o 49'].mean())
print("Divorce rate for males ages 50-54:",uk_divorce_marriage_df['DRMale 50 t
o 54'].mean())
print("Divorce rate for males ages 55-59:",uk_divorce_marriage_df['DRMale 55 t
o 59'].mean())
```

```
Divorce rate for males ages 20-24: 21.892
Divorce rate for males ages 25-29: 24.588
Divorce rate for males ages 30-34: 23.856
Divorce rate for males ages 35-39: 21.548
Divorce rate for males ages 40-44: 18.688
Divorce rate for males ages 45-49: 15.068
Divorce rate for males ages 50-54: 10.708
Divorce rate for males ages 55-59: 6.716
```

In [14]:
```
# Choose the height of the bars
height = [uk_divorce_marriage_df['DRMale 20 to 24'].mean(), uk_divorce_marriag
e_df['DRMale 25 to 29'].mean(),uk_divorce_marriage_df['DRMale 30 to 34'].mean
(),uk_divorce_marriage_df['DRMale 35 to 39'].mean(),uk_divorce_marriage_df['DR
Male 40 to 44'].mean(),uk_divorce_marriage_df['DRMale 45 to 49'].mean(),uk_div
orce_marriage_df['DRMale 50 to 54'].mean(),uk_divorce_marriage_df['DRMale 55 t
o 59'].mean()]

# Choose the names of the bars
bars = ('20-24', '25-29', '30-34', '35-39', '40-44','45-49','50-54','55-59')
y_pos = np.arange(len(bars))

# Create bars
plt.bar(y_pos, height)

# Create names on the x-axis
plt.xticks(y_pos, bars, color='orange')
plt.yticks(color='orange')

# Create x and y labels
plt.xlabel('Age group', fontweight='bold', color = 'orange', fontsize='18')
plt.ylabel('Average Divorce rate (%)', fontweight='bold', color = 'orange', fo
ntsize='18')

#Create title for figure
plt.title("Average Divore Rate by Age Group for Males between 1991 and 2015")

# Show graphic
plt.show()
```



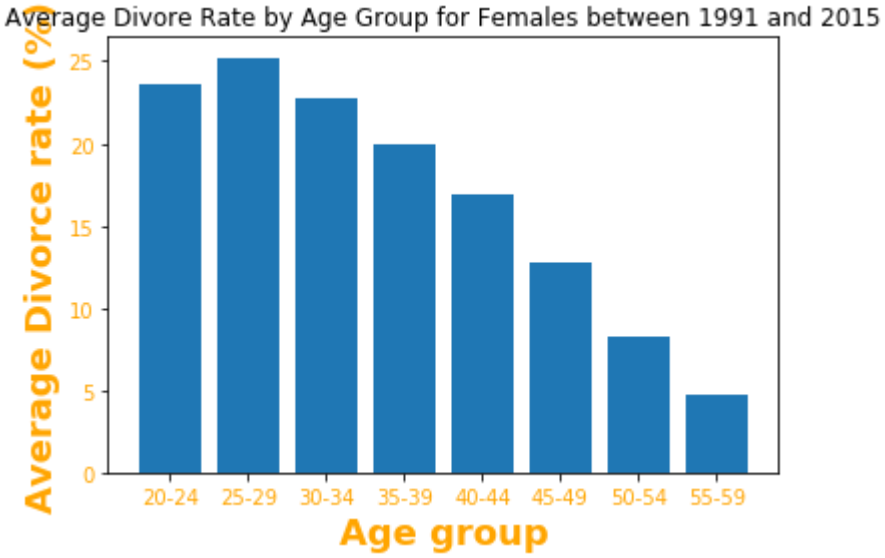
Between 1991 and 2015, which age group between ages 20-59 had the highest/lowest average divorce rate for females?

The code below was used to determine which age group between ages 20-59 had the highest/lowest average divorce rate for females between 1991 and 2015. Between 1991 and 2015, the age group between ages 20-59 with the highest average divorce rate for females was females aged 25-29, and the age group between ages 20-59 with the lowest average divorce rate for females was females aged 55-59. As females aged, they were less likely to divorce. The bar plot visualizes the average divorce rate by age group for females between 1991 and 2015.

In [15]:
```
print("Divorce rate for females ages 20-24:",uk_divorce_marriage_df['DRFemale
 20 to 24'].mean())
print("Divorce rate for females ages 25-29:",uk_divorce_marriage_df['DRFemale
 25 to 29'].mean())
print("Divorce rate for females ages 30-34:",uk_divorce_marriage_df['DRFemale
 30 to 34'].mean())
print("Divorce rate for females ages 35-39:",uk_divorce_marriage_df['DRFemale
 35 to 39'].mean())
print("Divorce rate for females ages 40-44:",uk_divorce_marriage_df['DRFemale
 40 to 44'].mean())
print("Divorce rate for females ages 45-49:",uk_divorce_marriage_df['DRFemale
 45 to 49'].mean())
print("Divorce rate for females ages 50-54:",uk_divorce_marriage_df['DRFemale
 50 to 54'].mean())
print("Divorce rate for females ages 55-59:",uk_divorce_marriage_df['DRFemale
 55 to 59'].mean())
```

```
Divorce rate for females ages 20-24: 23.632
Divorce rate for females ages 25-29: 25.212
Divorce rate for females ages 30-34: 22.768
Divorce rate for females ages 35-39: 19.916
Divorce rate for females ages 40-44: 16.932
Divorce rate for females ages 45-49: 12.812
Divorce rate for females ages 50-54: 8.28
Divorce rate for females ages 55-59: 4.752
```

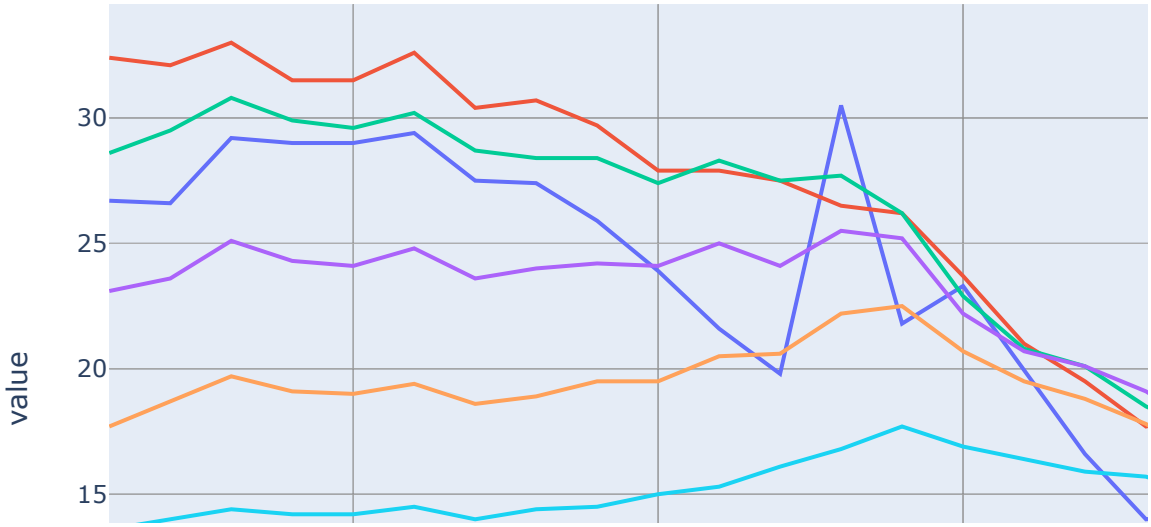
In [16]:
```
# Choose the height of the bars
height = [uk_divorce_marriage_df['DRFemale 20 to 24'].mean(), uk_divorce_marri
age_df['DRFemale 25 to 29'].mean(),uk_divorce_marriage_df['DRFemale 30 to 34']
.mean(),uk_divorce_marriage_df['DRFemale 35 to 39'].mean(),uk_divorce_marriage
_df['DRFemale 40 to 44'].mean(),uk_divorce_marriage_df['DRFemale 45 to 49'].me
an(),uk_divorce_marriage_df['DRFemale 50 to 54'].mean(),uk_divorce_marriage_df
['DRFemale 55 to 59'].mean()]

# Choose the names of the bars
bars = ('20-24', '25-29', '30-34', '35-39', '40-44','45-49','50-54','55-59')
y_pos = np.arange(len(bars))

# Create bars
plt.bar(y_pos, height)

# Create names on the x-axis
plt.xticks(y_pos, bars, color='orange')
plt.yticks(color='orange')

# Create x and y labels
plt.xlabel('Age group', fontweight='bold', color = 'orange', fontsize='18')
plt.ylabel('Average Divorce rate (%)', fontweight='bold', color = 'orange', fo
ntsize='18')

#Create title for figure
plt.title("Average Divore Rate by Age Group for Females between 1991 and 2015"
)

# Show graphic
plt.show()
```



How did the divorce rate for males aged 20-24, males aged 25-29, males aged 30-34, males aged 35-39, males aged 40-44, males aged 45-49, males aged 50-54, and males aged 55-59 change from 1991 to 2015?

The line graph below visualizes how the divorce rate for males aged 20-24, males aged 25-29, males aged 30-34, males aged 35-39, males aged 40-44, males aged 45-49, males aged 50-54, and males aged 55-59 changed from 1991 to 2015. From 1991 to 2015, the divorce rate for males aged 25-29, males aged 30-34, males aged 35-39, and males aged 40-44 decreased, while the divorce rate for males aged 45-49, males aged 50-54, and males aged 55-59 remained constant. Younger males divorced less frequently over the years.

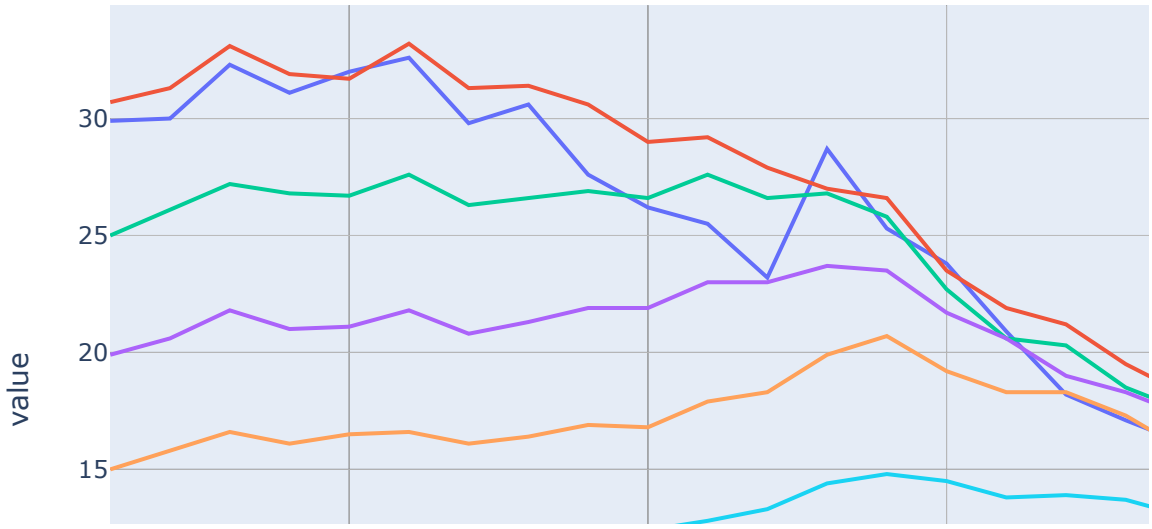
In [17]:
```
uk_male_dr_df_long=pd.melt(uk_divorce_marriage_df, id_vars=['Year'], value_var
s=['DRMale 20 to 24', 'DRMale 25 to 29', 'DRMale 30 to 34','DRMale 35 to 39',
'DRMale 40 to 44','DRMale 45 to 49','DRMale 50 to 54','DRMale 55 to 59'])
fig = px.line(uk_male_dr_df_long, x='Year', y='value', color='variable')
fig.show()
```



How did the divorce rate for females aged 20-24, females aged 25-29, females aged 30-34, females aged 35-39, females aged 40-44, females aged 45-49, females aged 50-54, and females aged 55-59 change from 1991 to 2015?

The line graph below visualizes how the divorce rate for females aged 20-24, females aged 25-29, females aged 30-34, females aged 35-39, females aged 40-44, females aged 45-49, females aged 50-54, and females aged 55-59 changed from 1991 to 2015. From 1991 to 2015, the divorce rate for females aged 25-29, females aged 30-34, and females aged 35-39 decreased, while the divorce rate for females aged 40-44, females aged 45-49, females aged 50-54, and females aged 55-59 remained constant. Younger females divorced less frequently over the years.

In [18]:
```
uk_female_dr_df_long=pd.melt(uk_divorce_marriage_df, id_vars=['Year'], value_v
ars=['DRFemale 20 to 24', 'DRFemale 25 to 29', 'DRFemale 30 to 34','DRFemale 3
5 to 39','DRFemale 40 to 44','DRFemale 45 to 49','DRFemale 50 to 54','DRFemale
55 to 59'])
fig = px.line(uk_female_dr_df_long, x='Year', y='value', color='variable')
fig.show()
```



Between 1991 and 2015, was the divorce rates for different age ranges significantly different? Has the divorce rate for different ranges changed since 1991? Which age groups were most likely to divorce?

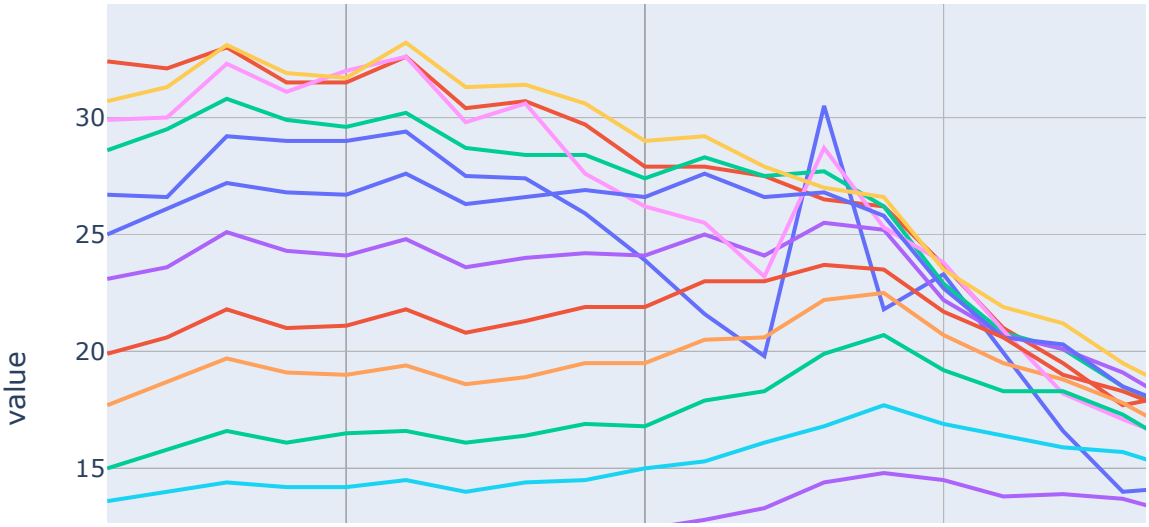
- Here we look at the divorce rates of men and women in varying age ranges.
- This data looks at divorce rates of men and women in the age ranges: 20-24, 25-29, 30-34, 35-39, 40-44, 44-49, 50-54, and 54-59.
- We want to answer the question of whether the divorce rates for age ranges are signigicantly different and if the divorce rates for different age ranges have changed since 1991.

In [19]:
```
age_df = uk_divorce_marriage_df.iloc[:, 0:20]
age_df = pd.DataFrame(age_df)
age_df.drop(age_df.columns[[1, 2, 3]], axis = 1, inplace = True)
age_df.head()
```

Out[19]:

	Year	DRMale 20 to 24	DRMale 25 to 29	DRMale 30 to 34	DRMale 35 to 39	DRMale 40 to 44	DRMale 45 to 49	DRMale 50 to 54	DRMale 55 to 59	DRFema 20 to
1	2015	10.5	13.0	11.9	12.6	13.1	12.6	10.1	7.1	11.2
2	2014	13.2	13.5	14.0	13.9	14.6	13.7	11.0	7.4	12.1
3	2013	14.7	15.9	15.8	16.7	16.7	15.3	12.0	7.8	16.3
4	2012	17.5	17.4	17.3	17.9	17.8	15.8	11.9	7.7	17.0
5	2011	19.5	17.1	18.8	17.9	18.0	15.4	11.5	7.6	16.4

In [20]:
```
age_df_mod = pd.melt(age_df, id_vars=['Year'], value_vars=age_df.keys()[1:], v
ar_name='Age')
fig = px.line(age_df_mod, x='Year', y='value', color='Age')
fig.show()
```



Findings

- Age seems to play a larger role in divorce rates than gender according to the above graph.
- Between 1991 and 2015, men and women tended to have lower divorce rates at higher ages, with both the male and female divorce rates for the age group 55-59 being the lowest of their respective genders.
- The age group with the highest divorce rate for both men and women every year fluctuated between the age groups of 20-24 and 25-29 during the time period.
- Divorce rates for older individuals remained relatively constant over the years, and divorce rates for younger individuals dropped by nearly half over the years.

Between 1991 and 2015, which age group had the highest divorce rate per year?

In [21]:
```
age_df.set_index('Year', inplace = True, drop = True)
numeric_age_df = age_df.idxmax(axis=1)
numeric_age_df.head()
```

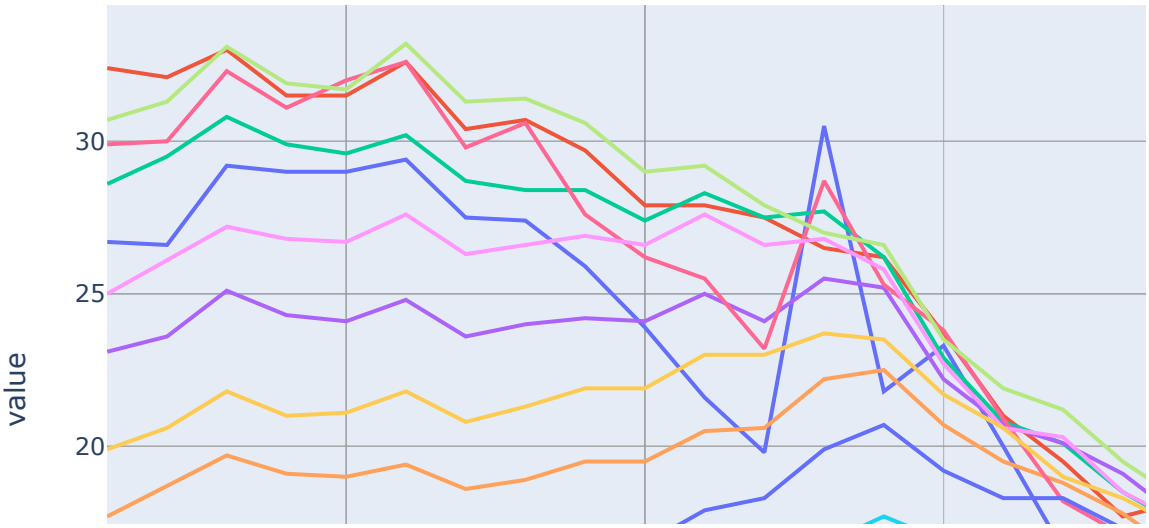
Out[21]:
```
Year
2015    DRFemale 25 to 29
2014    DRFemale 40 to 44
2013    DRFemale 25 to 29
2012    DRFemale 25 to 29
2011      DRMale 20 to 24
dtype: object
```

In [22]:
```
age_df2 = uk_divorce_marriage_df.iloc[:, [0,4,5,6,7,8,9,12,13,14,15,16,17]]
age_df2 = pd.DataFrame(age_df2)
#age_df2.drop(age_df.columns[[1, 2, 3]], axis = 1, inplace = True)
age_df2.head()
```

Out[22]:

	Year	DRMale 20 to 24	DRMale 25 to 29	DRMale 30 to 34	DRMale 35 to 39	DRMale 40 to 44	DRMale 45 to 49	DRFemale 20 to 24	DRFemale 25 to 29	DR
1	2015	10.5	13.0	11.9	12.6	13.1	12.6	11.2	13.3	12.
2	2014	13.2	13.5	14.0	13.9	14.6	13.7	12.1	14.8	14.
3	2013	14.7	15.9	15.8	16.7	16.7	15.3	16.3	16.8	16.
4	2012	17.5	17.4	17.3	17.9	17.8	15.8	17.0	18.7	17.
5	2011	19.5	17.1	18.8	17.9	18.0	15.4	16.4	18.5	18.

In [23]:
```
age_df_mod2 = pd.melt(age_df2, id_vars=['Year'], value_vars=age_df2.keys()[1:12], var_name='Age')
fig = px.line(age_df_mod2, x='Year', y='value', color='Age')
fig.show()
```



Findings

- Between 1991 and 2015, the age group with the highest divorce rate every year was either age group 20-24 or 25-29 (with two outliers being in 2014 and 2010), reaffirming that divorce rates are much higher amongst younger people in the UK than older people.

Between 1991 and 2015, were husbands more likely to divorce because of adultery, or because of unreasonable behavior?

The code below was used to determine whether husbands were more likely to divorce because of adultery or unreasonable behavior between 1991 and 2015. Between 1991 and 2015, the total number of divorces submitted by husbands because of adultery was less than the total number of divorces submitted by husbands because of unreasonable behavior. Therefore, husbands were more likely to divorce because of unreasonable behavior from their wife than because of adultery from their wife.

In [24]:
```
print("Total number of divorces submitted by husbands because of adultery:",uk_divorce_marriage_df['Husband Submitted - Reason Adultery'].sum())
print("Total number of divorces submitted by husbands because of unreasonable behavior:",uk_divorce_marriage_df['Husband Submitted - Reason Unreasonable Behaviour'].sum())
```

```
Total number of divorces submitted by husbands because of adultery: 278558.0
Total number of divorces submitted by husbands because of unreasonable behavior: 321614.0
```

Between 1991 and 2015, were wives more likely to divorce because of adultery, or because of unreasonable behavior?

The code below was used to determine whether wives were more likely to divorce because of adultery or unreasonable behavior between 1991 and 2015. Between 1991 and 2015, the total number of divorces submitted by wives because of adultery was less than the total number of divorces submitted by wives because of unreasonable behavior. Therefore, wives were more likely to divorce because of unreasonable behavior from their husband than adultery from their husband.

In [25]:
```
print("Total number of divorces submitted by wives because of adultery:",uk_divorce_marriage_df['Wife Submitted - Reason Adultery'].sum())
print("Total number of divorces submitted by wives because of unreasonable behavior:",uk_divorce_marriage_df['Wife Submitted - Reason Unreasonable Behaviour'].sum())
```

```
Total number of divorces submitted by wives because of adultery: 457647.0
Total number of divorces submitted by wives because of unreasonable behavior: 1259984.0
```

Between 1991 and 1995, how did the causes of divorce (filing for divorce because of adultery and filing for divorce because of unreasonable behavior) change over time?

- Here we chose to look at people filing for divorce because of adultery and filing for divorce because of unreasonable behavior, and in which gender they occured more often.
- First we add columns that show the percentage of adultery and unreasonable behavior divorces, and then the percentages for each gender.

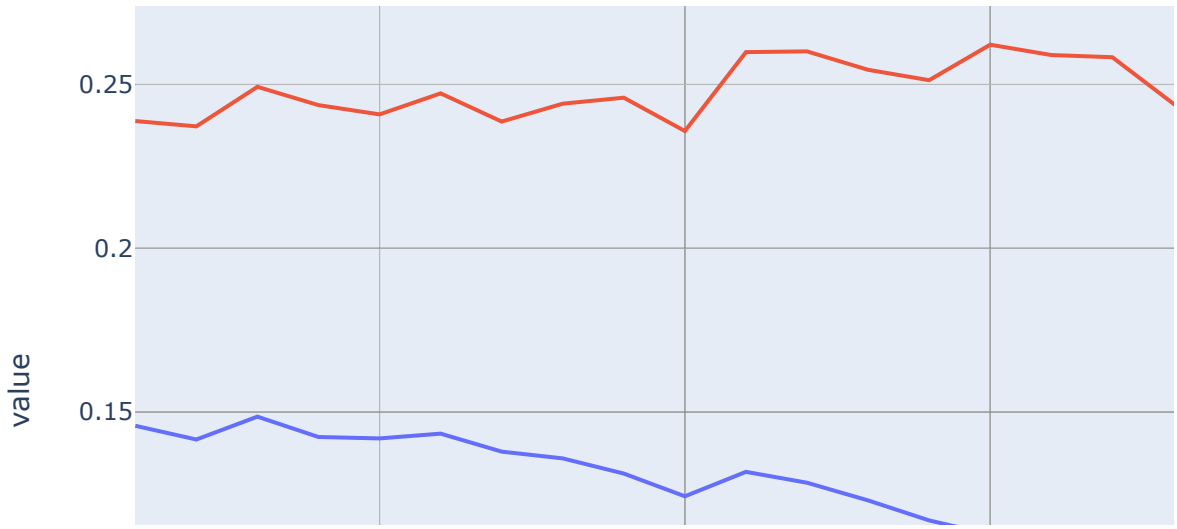
In [26]:
```
uk_divorce_marriage_df2=uk_divorce_marriage_df
uk_divorce_marriage_df2['Adultery %'] = (uk_divorce_marriage_df2['Wife Submitt
ed - Reason Adultery'] + uk_divorce_marriage_df2['Husband Submitted - Reason A
dultery'])/uk_divorce_marriage_df2['Total Number of Marriages']
uk_divorce_marriage_df2['Unreasonable %'] = (uk_divorce_marriage_df2['Wife Sub
mitted - Reason Unreasonable Behaviour'] + uk_divorce_marriage_df2['Husband Su
bmitted - Reason Unreasonable Behaviour'])/uk_divorce_marriage_df2['Total Numb
er of Marriages']

uk_divorce_marriage_df2['Husband Sub Unreasonable %'] = (uk_divorce_marriage_d
f2['Husband Submitted - Reason Unreasonable Behaviour'])/uk_divorce_marriage_d
f2['Total Number of Marriages']
uk_divorce_marriage_df2['Wife Sub Unreasonable %'] = (uk_divorce_marriage_df2[
'Wife Submitted - Reason Unreasonable Behaviour'])/uk_divorce_marriage_df2['To
tal Number of Marriages']

uk_divorce_marriage_df2['Husband Sub For Adltry %'] = (uk_divorce_marriage_df2
['Husband Submitted - Reason Adultery'])/uk_divorce_marriage_df2['Total Number
of Marriages']
uk_divorce_marriage_df2['Wife Sub For Adltry %'] = (uk_divorce_marriage_df2['W
ife Submitted - Reason Adultery'])/uk_divorce_marriage_df2['Total Number of Ma
rriages']
uk_divorce_marriage_df2.head()
```

Out[26]:

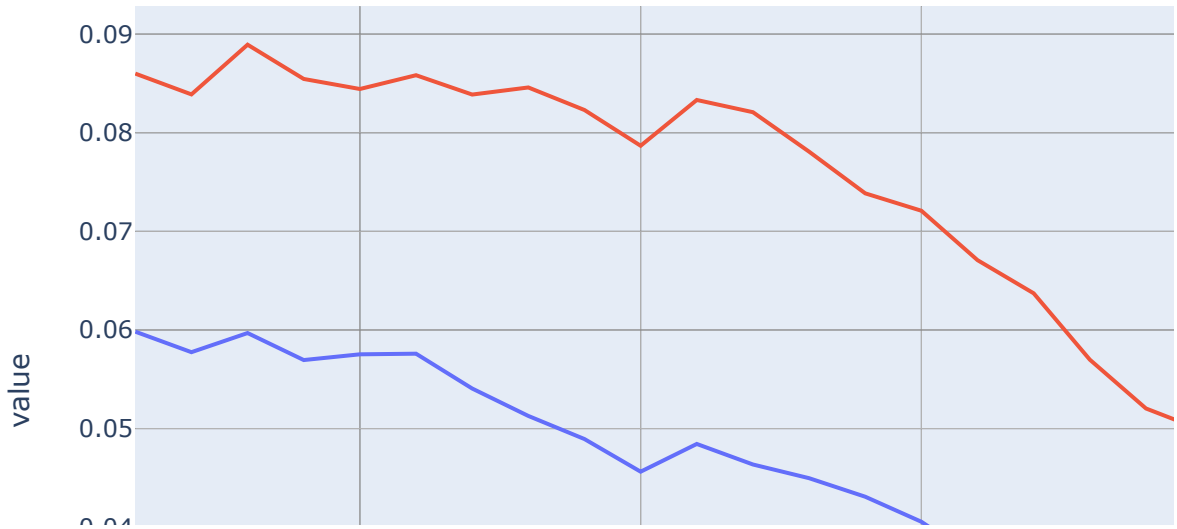
	Year	Total Number of Divorces	Husband Submitted Divorce	Wife Submitted Divorce	DRMale 20 to 24	DRMale 25 to 29	DRMale 30 to 34	DRMale 35 to 39	DRMale 40 to 44	D
1	2015	101055	38490	62565	10.5	13.0	11.9	12.6	13.1	12
2	2014	111169	41364	69803	13.2	13.5	14.0	13.9	14.6	13
3	2013	114720	40635	74076	14.7	15.9	15.8	16.7	16.7	15
4	2012	118140	41601	76490	17.5	17.4	17.3	17.9	17.8	15
5	2011	117558	40414	77083	19.5	17.1	18.8	17.9	18.0	15

5 rows × 45 columns

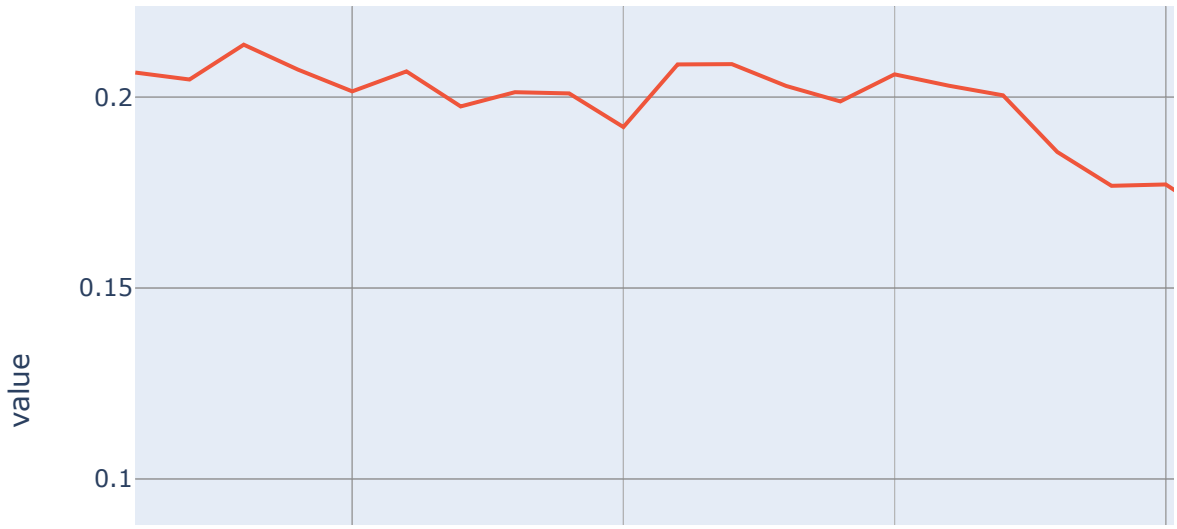
In [27]:
```
uk_divorce_marriage_df_causes=pd.melt(uk_divorce_marriage_df2, id_vars=['Year'
], value_vars=['Adultery %', 'Unreasonable %'])
fig = px.line(uk_divorce_marriage_df_causes, x='Year', y='value', color='varia
ble')
fig.show()
```



In [28]:
```
uk_divorce_marriage_df_causes=pd.melt(uk_divorce_marriage_df2, id_vars=['Year'
], value_vars=['Husband Sub For Adltry %', 'Wife Sub For Adltry %'])
fig = px.line(uk_divorce_marriage_df_causes, x='Year', y='value', color='varia
ble')
fig.show()
```



In [29]:
```
uk_divorce_marriage_df_causes=pd.melt(uk_divorce_marriage_df2, id_vars=['Year'
], value_vars=['Husband Sub Unreasonable %', 'Wife Sub Unreasonable %'])
fig = px.line(uk_divorce_marriage_df_causes, x='Year', y='value', color='varia
ble')
fig.show()
```



Between 1991 and 2015, the prevalence of divorce being filed because of adultery or because of unreasonable behavior went down significantly over the years, for both men and women. During the time period, it was more likely for a person to file for divorce because of unreasonable behavior than adultery, for both men and women.

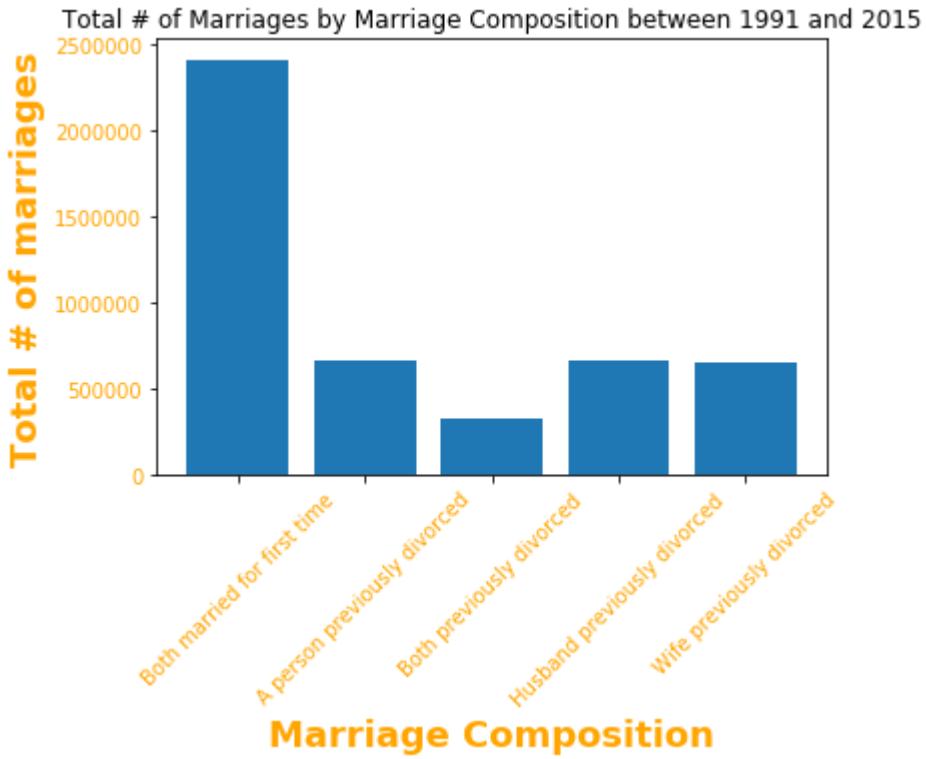
Between 1991 and 2015, how many marriages consisted of people who both married for the first time, a person who previously divorced, people who both previously divorced, the husband previously divorcing, and the wife previously divorcing?

The code below was used to determine how many marriages consisted of people who both married for the first time, a person who previously divorced, people who both previously divorced, the husband previously divorcing, and the wife previously divorcing between 1991 and 2015. Between 1991 and 2015, the number of marriages consisting of people who both married for the first time was 2,411,751, the number of marriages consisting of a person who previously divorced was 659,441, the number of marriages consisting of people who both previously divorced was 326,570, the number of marriages consisting of the husband previously divorcing was 665,693, and the number of marriages consisting of the wife previously divorcing was 647,657. A marriage was most likely to consist of people marrying for the first time, and least likely to consist of people who both previously divorced. The bar plot visualizes the number of marriages by marriage composition between 1991 and 2015.

In [30]:
```
print("Marriages consisting of people who both married for the first time:",uk
_divorce_marriage_df['First marriage of both parties'].sum())
print("Marriages consisting of a person who previously divorced:",uk_divorce_m
arriage_df['One party previously divorced'].sum())
print("Marriages consisting of people who both previously divorced:",uk_divorc
e_marriage_df['Both parties previously divorced'].sum())
print("Marriages consisting of the husband previously divorcing:",uk_divorce_m
arriage_df['Husband - Previously Divorced'].sum())
print("Marriages consisting of the wife previously divorcing:",uk_divorce_marr
iage_df['Wife - Previously Divorced'].sum())
```

```
Marriages consisting of people who both married for the first time: 2411751
Marriages consisting of a person who previously divorced: 659441
Marriages consisting of people who both previously divorced: 326570
Marriages consisting of the husband previously divorcing: 665693
Marriages consisting of the wife previously divorcing: 647657
```

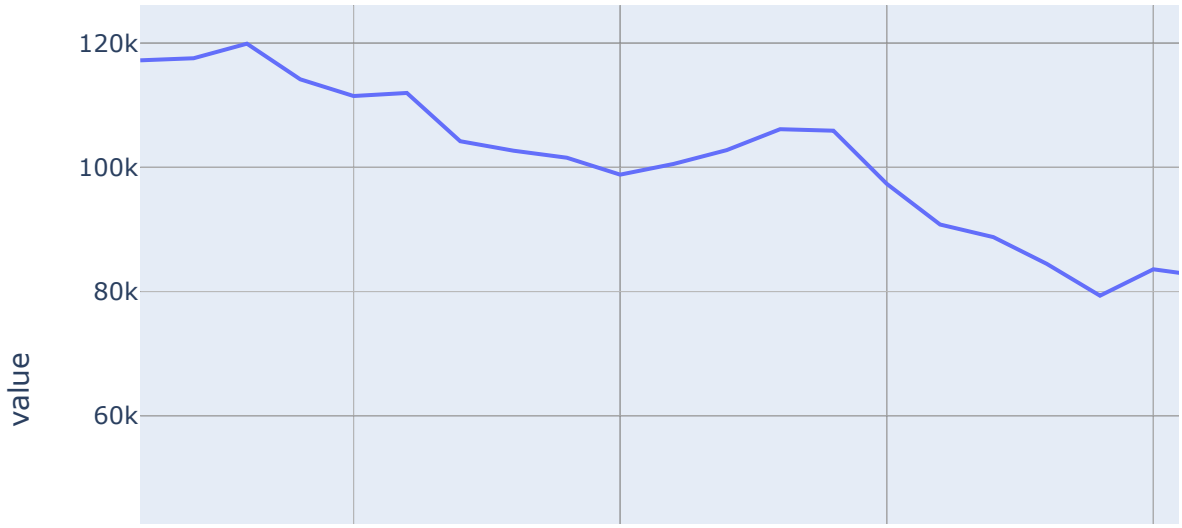
In [31]:
```
# Choose the height of the bars
height = [uk_divorce_marriage_df['First marriage of both parties'].sum(),uk_di
vorce_marriage_df['One party previously divorced'].sum(),uk_divorce_marriage_d
f['Both parties previously divorced'].sum(),uk_divorce_marriage_df['Husband -
 Previously Divorced'].sum(),uk_divorce_marriage_df['Wife - Previously Divorce
d'].sum()]

# Choose the names of the bars
bars = ('Both married for first time', 'A person previously divorced', 'Both p
reviously divorced', 'Husband previously divorced', 'Wife previously divorced'
)
y_pos = np.arange(len(bars))

# Create bars
plt.bar(y_pos, height)

# Create names on the x-axis
plt.xticks(y_pos, bars, color='orange',rotation=45)
plt.yticks(color='orange')

# Create x and y labels
plt.xlabel('Marriage Composition', fontweight='bold', color = 'orange', fontsi
ze='18')
plt.ylabel('Total # of marriages', fontweight='bold', color = 'orange', fontsi
ze='18')

#Create title for figure
plt.title("Total # of Marriages by Marriage Composition between 1991 and 2015"
)

# Show graphic
plt.show()
```



How did the number of marriages consisting of people who both married for the first time, a person who previously divorced, people who both previously divorced, the husband previously divorcing, and the wife previously divorcing change from 1991 to 2015?

The line graph below visualizes how the number of marriages consisting of people who both married for the first time, a person who previously divorced, people who both previously divorced, the husband previously divorcing, and the wife previously divorcing has changed from 1991 and to 2015. From 1991 to 2015, the number of marriages consisting of people who both married for the first time decreased, while the number of marriages consisting of a person who previously divorced, people who both previously divorced, the husband previously divorcing, and the wife previously divorcing remained relatively constant. Marriages consisting of people marrying for the first time became less common over the years.

In [32]:
```
uk_marriage_composition_df_long=pd.melt(uk_divorce_marriage_df, id_vars=['Yea
r'], value_vars=['First marriage of both parties', 'One party previously divor
ced','Both parties previously divorced','Husband - Previously Divorced','Wife
 - Previously Divorced'])
fig = px.line(uk_marriage_composition_df_long, x='Year', y='value', color='var
iable')
fig.show()
```



Which 5 years had the highest and lowest median age for males getting married between 1991 and 2015?

The tables below show the 5 years with the highest and lowest median age for males getting married between 1991 and 2015. Between 1991 and 2015, the 5 years with the highest median age for males getting married were 2015, 2014, 2013, 2012, and 2011. The 5 years with the lowest median age for males getting married were 1991, 1992, 1993, 1994, and 1995. Over time, males got married at an older age.

In [33]:
```
top5_years_median_age_male=uk_divorce_marriage_df[['Year','Median Age of Singl
e Males Marriage']].sort_values('Median Age of Single Males Marriage', ascendi
ng=False).head(5)
top5_years_median_age_male
```

Out[33]:

	Year	Median Age of Single Males Marriage
1	2015	31.5
2	2014	31.2
3	2013	31.1
4	2012	31.0
5	2011	30.9

In [34]:
```
bottom5_years_median_age_male=uk_divorce_marriage_df[['Year','Median Age of Si
ngle Males Marriage']].sort_values('Median Age of Single Males Marriage', asce
nding=True).head(5)
bottom5_years_median_age_male
```

Out[34]:

	Year	Median Age of Single Males Marriage
25	1991	26.5
24	1992	26.8
23	1993	27.2
22	1994	27.5
21	1995	27.9

Which 5 years had the highest and lowest median age for females getting married between 1991 and 2015?

The tables below show the 5 years with the highest and lowest median age for females getting married between 1991 and 2015. Between 1991 and 2015, the 5 years with the highest median age for females getting married were 2015, 2014, 2013, 2012, and 2011. The 5 years with the lowest median age for females getting married were 1991, 1992, 1993, 1994, and 1995. Over time, females got married at an older age.

In [35]:
```
top5_years_median_age_female=uk_divorce_marriage_df[['Year','Median Age of Sin
gle Females Marriage']].sort_values('Median Age of Single Females Marriage', a
scending=False).head(5)
top5_years_median_age_female
```

Out[35]:

	Year	Median Age of Single Females Marriage
1	2015	29.7
2	2014	29.5
3	2013	29.3
4	2012	29.1
5	2011	29.1

In [36]:
```
bottom5_years_median_age_female=uk_divorce_marriage_df[['Year','Median Age of
 Single Females Marriage']].sort_values('Median Age of Single Females Marriag
e', ascending=True).head(5)
bottom5_years_median_age_female
```

Out[36]:

	Year	Median Age of Single Females Marriage
25	1991	24.6
24	1992	25.0
23	1993	25.3
22	1994	25.7
21	1995	26.0

From 1991 to 2015, how many years was the median age for men getting married greater than the median age for women getting married?

The code below was used to determine the number of years the median age for men getting married was greater than the median age for women getting married. From 1991 to 2015, the number of years the median age for men getting married was greater than the median age for women getting married was 25. Every year, the median age for males getting married was greater than the median age for females getting married, showing that males tended to marry younger women.

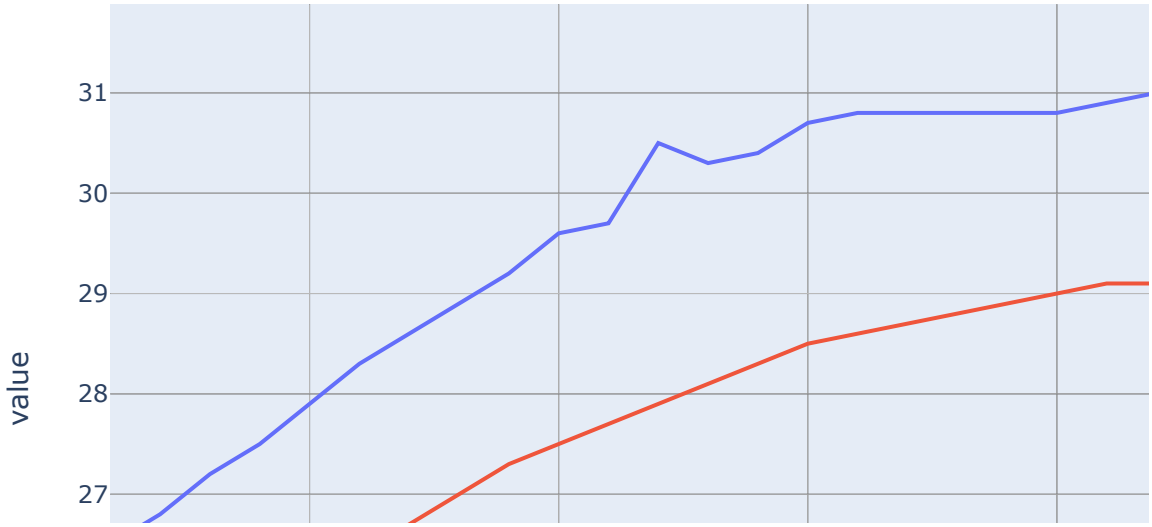
In [37]:
```
years=0
for i in range(1,uk_divorce_marriage_df.shape[0]+1):
    men_median_age=uk_divorce_marriage_df.loc[i,'Median Age of Single Males Ma
rriage']
    women_median_age=uk_divorce_marriage_df.loc[i,'Median Age of Single Female
s Marriage']
    if(men_median_age>women_median_age):
        years=years+1
print("The number of years where the median age of men getting married was gre
ater than the median age of women getting married:",years)
```

```
The number of years where the median age of men getting married was greater t
han the median age of women getting married: 25
```

How did the median age for males and females getting married change from 1991 to 2015?

The line graph below visualizes how the median age of males and females getting married changed from 1991 and to 2015. From 1991 to 2015, the the median age for males and females getting married increased. Males and females got married at an older age over the years.

In [38]:
```
uk_median_age_marriage_df_long=pd.melt(uk_divorce_marriage_df, id_vars=['Year'
], value_vars=['Median Age of Single Males Marriage', 'Median Age of Single Fe
males Marriage'])
fig = px.line(uk_median_age_marriage_df_long, x='Year', y='value', color='vari
able')
fig.show()
```



From 1991 to 2015, how many years was the number of men marrying per 1,000 unmarried men greater than the number of women marrying per 1,000 unmarried women?

The code below was used to determine the number of years the number of men marrying per 1,000 unmarried men was greater than the number of women marrying per 1,000 unmarried women from 1991 to 2015. From 1991 to 2015, the number of years where the number of men marrying per 1,000 unmarried men was greater than the number of women marrying per 1,000 unmarried women was 25. Every year, the number of men marrying per 1,000 unmarried men was greater than the number of women marrying per 1,000 unmarried women, showing that more males tended to marry than women.

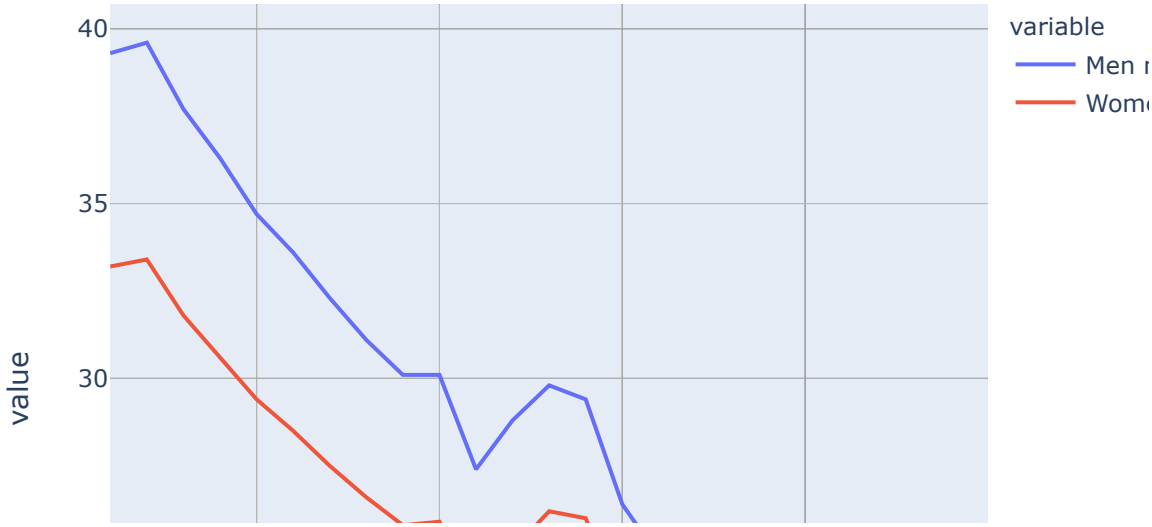
In [39]:
```
years=0
for i in range(1,uk_divorce_marriage_df.shape[0]+1):
    num_men_marrying_each_1000=uk_divorce_marriage_df.loc[i,'Men marrying per
 1,000 unmarried1 men aged 16 and over']
    num_women_marrying_each_1000=uk_divorce_marriage_df.loc[i,'Women marrying
 per 1,000 unmarried1 women aged 16 and over']
    if(num_men_marrying_each_1000>num_women_marrying_each_1000):
        years=years+1
print("The number of years where the the number of men marrying per 1,000 unma
rried men was greater than the number of women marrying per 1,000 unmarried wo
men:",years)
```

```
The number of years where the the number of men marrying per 1,000 unmarried
men was greater than the number of women marrying per 1,000 unmarried women:
25
```

How did the number of men and marrying per 1,000 unmarried men and number of women marrying per 1,000 unmarried women change from 1991 to 2015?

The line graph below visualizes how the number of men marrying per 1,000 unmarried men and number of women marrying per 1,000 unmarried women changed from 1991 to 2015. From 1991 to 2015, the number of men marrying per 1,000 unmarried men and number of women marrying per 1,000 unmarried women decreased. Males and females married less frequently over the years.

In [40]:
```
uk_marriage_every_1000_df_long=pd.melt(uk_divorce_marriage_df, id_vars=['Year'
], value_vars=['Men marrying per 1,000 unmarried1 men aged 16 and over', 'Wome
n marrying per 1,000 unmarried1 women aged 16 and over'])
fig = px.line(uk_marriage_every_1000_df_long, x='Year', y='value', color='vari
able')
fig.show()
```



From 1991 to 2015, how many years was the number of men marrying for the first time per 1,000 people greater than number of women marrying for the first time per 1,000 people?

The code below was used to determine the number of years where the number of men marrying for the first time per 1,000 people was greater than number of women marrying for the first time per 1,000 people from 1991 to 2015. From 1991 to 2015, the number of years where the number of men marrying for the first time per 1,000 people was greater than number of women marrying for the first time per 1,000 people was 0. Every year, the number of men marrying for the first time per 1,000 people was less than the number of women marrying for the first time per 1,000 people, showing that less men tended to marry for the first time than women.

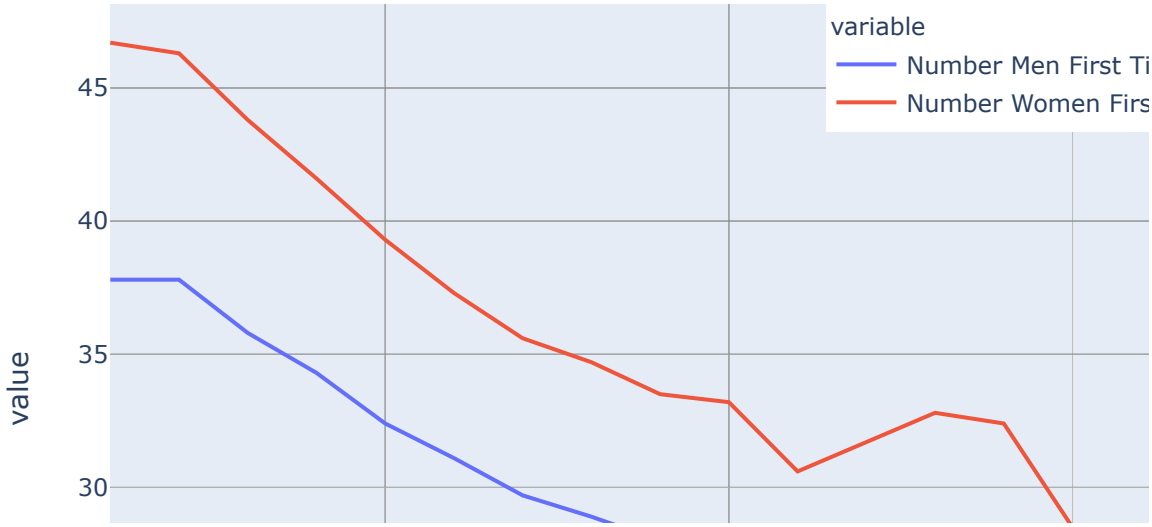
In [41]:
```
years=0
for i in range(1,uk_divorce_marriage_df.shape[0]+1):
    num_men_marrying_first_time_each_1000=uk_divorce_marriage_df.loc[i,'Number
Men First Time marrying per 1,000 single population aged 16 and over']
    num_women_marrying_first_time_each_1000=uk_divorce_marriage_df.loc[i,'Numb
er Women First Time marrying per 1,000 single population aged 16 and over']
    if(num_men_marrying_first_time_each_1000>num_women_marrying_first_time_eac
h_1000):
        years=years+1
print("The number of years where the number of men marrying for the first time
per 1,000 people was greater than number of women marrying for the first time
 per 1,000 people:",years)
```

```
The number of years where the number of men marrying for the first time per
1,000 people was greater than number of women marrying for the first time per
1,000 people: 0
```

How did the number of men marrying for the first time per 1,000 people and number of women marrying for the first time per 1,000 people change from 1991 to 2015?

The line graph below visualizes how the number of men marrying for the first time per 1,000 people and number of women marrying for the first time per 1,000 people changed from 1991 to 2015. From 1991 to 2015, the number of men marrying for the first time per 1,000 people and number of women marrying for the first time per 1,000 people decreased. Men and women got married for the first time less frequently over the years. Less marriages consisted of people getting married for the first time over the years.

In [42]:
```
uk_marriage_first_time_every_1000_df_long=pd.melt(uk_divorce_marriage_df, id_v
ars=['Year'], value_vars=['Number Men First Time marrying per 1,000 single pop
ulation aged 16 and over', 'Number Women First Time marrying per 1,000 single
 population aged 16 and over'])
fig = px.line(uk_marriage_first_time_every_1000_df_long, x='Year', y='value',
color='variable')
fig.show()
```



From 1991 to 2015, how many years was the number of men remarrying per 1,000 people greater than the number of women remarrying per 1,000 people?

The code below was used to determine the number of years where the number of men remarrying per 1,000 people was greater than the number of women remarrying per 1,000 people from 1991 to 2015. From 1991 to 2015, the number of years where the number of men remarrying per 1,000 people was greater than the number of women remarrying per 1,000 people was 25. Every year, the number of men remarrying per 1,000 people was greater than the number of women remarrying per 1,000 people, showing that more men tended to remarry than women.

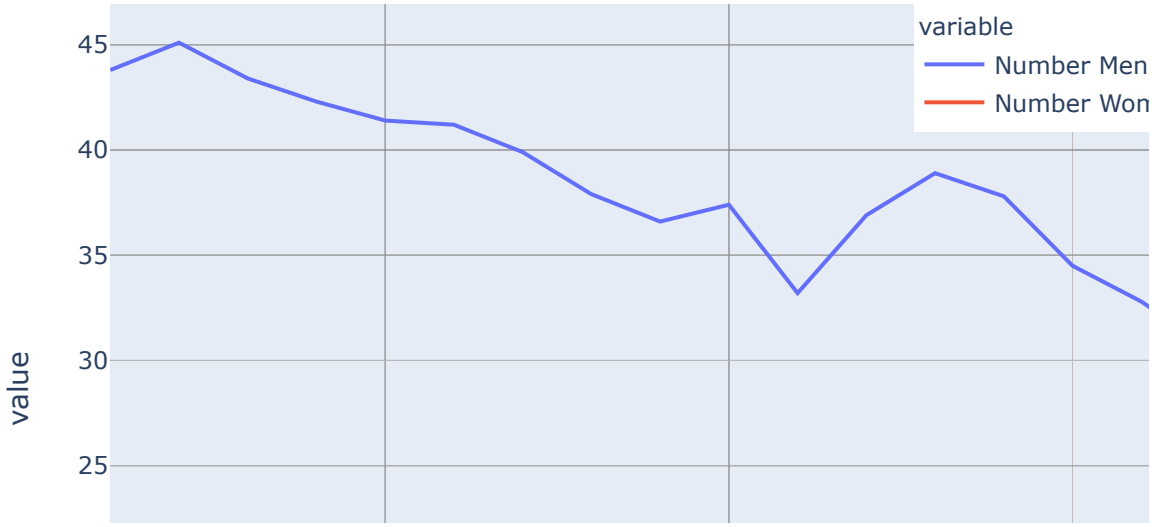
In [43]:
```
years=0
for i in range(1,uk_divorce_marriage_df.shape[0]+1):
    num_men_remarrying_each_1000=uk_divorce_marriage_df.loc[i,'Number Men Re-m
arrying per 1,000 single population aged 16 and over']
    num_women_remarrying_each_1000=uk_divorce_marriage_df.loc[i,'Number Women
 Re-marrying per 1,000 single population aged 16 and over']
    if(num_men_remarrying_each_1000>num_women_remarrying_each_1000):
        years=years+1
print("The number of years where the number of men remarrying per 1,000 people
was greater than the number of women remarrying per 1,000 people:",years)
```

```
The number of years where the number of men remarrying per 1,000 people was g
reater than the number of women remarrying per 1,000 people: 25
```

How did the number of men remarrying per 1,000 people and number of women remarrying per 1,000 people change from 1991 to 2015?

The line graph below visualizes how the number of men remarrying per 1,000 people and number of women remarrying per 1,000 people changed from 1991 to 2015. From 1991 to 2015, the number of men remarrying per 1,000 people and number of women remarrying per 1,000 people decreased. Men and womem got remarried less frequently over the years.

In [44]:
```
uk_remarrying_every_1000_df_long=pd.melt(uk_divorce_marriage_df, id_vars=['Year'], value_vars=['Number Men Re-marrying per 1,000 single population aged 16 and over', 'Number Women Re-marrying per 1,000 single population aged 16 and over'])
fig = px.line(uk_remarrying_every_1000_df_long, x='Year', y='value', color='variable')
fig.show()
```



From 1991 to 2015, how many years was the number of men marrying for the first time per 1,000 people greater than the number of men remarrying per 1,000 people?

The code below was used to determine the number of years where the number of men marrying for the first time per 1,000 people was greater than the number of men remarrying per 1,000 people from 1991 to 2015. From 1991 to 2015, the number of years where the number of men marrying for the first time per 1,000 people was greater than the number of men remarrying per 1,000 people was 0. Every year, the number of men marrying for the first time per 1,000 people was less than the number of men remarrying per 1,000 people, showing that men were more likely to be getting remarried than getting married for the first time.

In [45]:
```
years=0
for i in range(1,uk_divorce_marriage_df.shape[0]+1):
    num_men_marrying_first_time_each_1000=uk_divorce_marriage_df.loc[i,'Number
Men First Time marrying per 1,000 single population aged 16 and over']
    num_men_remarrying_each_1000=uk_divorce_marriage_df.loc[i,'Number Men Re-m
arrying per 1,000 single population aged 16 and over']
    if(num_men_marrying_first_time_each_1000>num_men_remarrying_each_1000):
        years=years+1
print("The number of years where the number of men marrying for the first time
per 1,000 people was greater than the number of men remarrying per 1,000 peopl
e:",years)
```

```
The number of years where the number of men marrying for the first time per
1,000 people was greater than the number of men remarrying per 1,000 people:
0
```

From 1991 to 2015, how many years was the number of women marrying for the first time per 1,000 people greater than the number of women remarrying per 1,000 people?

The code below was used to determine the number of years where the number of women marrying for the first time per 1,000 people was greater than the number of women remarrying per 1,000 people from 1991 to 2015. From 1991 to 2015, the number of years where the number of women marrying for the first time per 1,000 people was greater than the number of women remarrying per 1,000 people was 25. Every year, the number of women marrying for the first time per 1,000 people was greater than the number of women remarrying per 1,000 people, showing that women were more likely to be getting married for the first time than getting remarried.

In [46]:
```
years=0
for i in range(1,uk_divorce_marriage_df.shape[0]+1):
    num_women_marrying_first_time_each_1000=uk_divorce_marriage_df.loc[i,'Numb
er Women First Time marrying per 1,000 single population aged 16 and over']
    num_women_remarrying_each_1000=uk_divorce_marriage_df.loc[i,'Number Women
 Re-marrying per 1,000 single population aged 16 and over']
    if(num_women_marrying_first_time_each_1000>num_women_remarrying_each_1000
):
        years=years+1
print("The number of years where the number of women marrying for the first ti
me per 1,000 people was greater than the number of women remarrying per 1,000
 people:",years)
```

```
The number of years where the number of women marrying for the first time per
1,000 people was greater than the number of women remarrying per 1,000 peopl
e: 25
```

Conclusion

From our analysis, the following findings/results were found in relation to UK divorce and marriage from 1991 to 2015:

- Between 1991 and 2015, the 5 years with the highest number of marriages were 1992, 1991, 1993, 1994, and 1995. The 5 years with the lowest number of marriages were 2009, 2007, 2008, 2015, and 2006. Over time, marriage became less frequent.
- Between 1991 and 2015, the 5 years with the highest number of divorces were 1993, 1992, 1991, 1994, and 1996. The 5 years with the lowest number of divorces were 2015, 2014, 2009, 2013, and 2011. Over time, divorces became less frequent.
- From 1991 to 2015, the number of marriages and divorces decreased. Marriage and divorce became less common over the years.
- From 1991 to 2015, the number of years husbands filed for divorce more than wives was 0. Every year, husbands filed for divorce less than wives, showing that wives were more likely to file for divorce than husbands.
- From 1991 to 2015, the number divorces filed by wives decreased, while the number of divorces filed by husbands remained constant. Wives filed for divorce less often over the years, and men filed for divorce at the same rate over the years.
- From 1991 to 2015, wives submitted for divorce at a significantly higher rate than husbands. However, over the years, the gap between the number of wives filing for divorce and the number of husbands filing for divorce decreased from about three times as much to two times as much.
- Between 1991 and 2015, the age group between ages 20-59 with the highest average divorce rate for males was males aged 25-29, and the age group between ages 20-59 with the lowest average divorce rate for males was males aged 55-59. As males aged, they were less likely to divorce.
- Between 1991 and 2015, the age group between ages 20-59 with the highest average divorce rate for females was females aged 25-29, and the age group between ages 20-59 with the lowest average divorce rate for females was females aged 55-59. As females aged, they were less likely to divorce.
- From 1991 to 2015, the divorce rate for males aged 25-29, males aged 30-34, males aged 35-39, and males aged 40-44 decreased, while the divorce rate for males aged 45-49, males aged 50-54, and males aged 55-59 remained constant. Younger males divorced less frequently over the years.
- From 1991 to 2015, the divorce rate for females aged 25-29, females aged 30-34, and females aged 35-39 decreased, while the divorce rate for females aged 40-44, females aged 45-49, females aged 50-54, and females aged 55-59 remained constant. Younger females divorced less frequently over the years.
- Age seemed to play a larger role in divorce rates than gender. Between 1991 and 2015, men and women tended to have lower divorce rates at higher ages, with both the male and female divorce rates for the age group 55-59 being the lowest of their respective genders. The age group with the highest divorce rate for both men and women every year fluctuated between the age groups of 20-24 and 25-29 during the time period. Divorce rates for older individuals remained relatively constant over the years, and divorce rates for younger individuals dropped by nearly half over the years.
- Between 1991 and 2015, the age group with the highest divorce rate every year was either age group 20-24 or 25-29 (with two outliers being in 2014 and 2010), reaffirming that divorce rates are much higher amongst younger people in the UK than older people.
- Between 1991 and 2015, the total number of divorces submitted by husbands because of adultery was less than the total number of divorces submitted by husbands because of unreasonable behavior.

Therefore, husbands were more likely to divorce because of unreasonable behavior from their wife than because of adultery from their wife.

- Between 1991 and 2015, the total number of divorces submitted by wives because of adultery was less than the total number of divorces submitted by wives because of unreasonable behavior. Therefore, wives were more likely to divorce because of unreasonable behavior from their husband than adultery from their husband.
- Between 1991 and 2015, the prevalence of divorce being filed because of adultery or because of unreasonable behavior went down significantly over the years, for both men and women. During the time period, it was more likely for a person to file for divorce because of unreasonable behavior than adultery, for both men and women.
- Between 1991 and 2015, the number of marriages consisting of people who both married for the first time was 2,411,751, the number of marriages consisting of a person who previously divorced was 659,441, the number of marriages consisting of people who both previously divorced was 326,570, the number of marriages consisting of the husband previously divorcing was 665,693, and the number of marriages consisting of the wife previously divorcing was 647,657. A marriage was most likely to consist of people marrying for the first time, and least likely to consist of people who both previously divorced.
- From 1991 to 2015, the number of marriages consisting of people who both married for the first time decreased, while the number of marriages consisting of a person who previously divorced, people who both previously divorced, the husband previously divorcing, and the wife previously divorcing remained relatively constant. Marriages consisting of people marrying for the first time became less common over the years.
- Between 1991 and 2015, the 5 years with the highest median age for males getting married were 2015, 2014, 2013, 2012, and 2011. The 5 years with the lowest median age for males getting married were 1991, 1992, 1993, 1994, and 1995. Over time, males got married at an older age.
- Between 1991 and 2015, the 5 years with the highest median age for females getting married were 2015, 2014, 2013, 2012, and 2011. The 5 years with the lowest median age for females getting married were 1991, 1992, 1993, 1994, and 1995. Over time, females got married at an older age.
- From 1991 to 2015, the number of years the median age for men getting married was greater than the median age for women getting married was 25. Every year, the median age for males getting married was greater than the median age for females getting married, showing that males tended to marry younger women.
- From 1991 to 2015, the median age for males and females getting married increased. Males and females got married at an older age over the years.
- From 1991 to 2015, the number of years where the number of men marrying per 1,000 unmarried men was greater than the number of women marrying per 1,000 unmarried women was 25. Every year, the number of men marrying per 1,000 unmarried men was greater than the number of women marrying per 1,000 unmarried women, showing that more males tended to marry than women.
- From 1991 to 2015, the number of men marrying per 1,000 unmarried men and number of women marrying per 1,000 unmarried women decreased. Males and females married less frequently over the years.
- From 1991 to 2015, the number of years where the number of men marrying for the first time per 1,000 people was greater than number of women marrying for the first time per 1,000 people was 0. Every year, the number of men marrying for the first time per 1,000 people was less than the number of women marrying for the first time per 1,000 people, showing that less men tended to marry for the first time than women.
- From 1991 to 2015, the number of men marrying for the first time per 1,000 people and number of women marrying for the first time per 1,000 people decreased. Men and women got married for the first

time less frequently over the years. Less marriages consisted of people getting married for the first time over the years.

- From 1991 to 2015, the number of years where the number of men remarrying per 1,000 people was greater than the number of women remarrying per 1,000 people was 25. Every year, the number of men remarrying per 1,000 people was greater than the number of women remarrying per 1,000 people, showing that more men tended to remarry than women.
- From 1991 to 2015, the number of men remarrying per 1,000 people and number of women remarrying per 1,000 people decreased. Men and women got remarried less frequently over the years.
- From 1991 to 2015, the number of years where the number of men marrying for the first time per 1,000 people was greater than the number of men remarrying per 1,000 people was 0. Every year, the number of men marrying for the first time per 1,000 people was less than the number of men remarrying per 1,000 people, showing that men were more likely to be getting remarried than getting married for the first time.
- From 1991 to 2015, the number of years where the number of women marrying for the first time per 1,000 people was greater than the number of women remarrying per 1,000 people was 25. Every year, the number of women marrying for the first time per 1,000 people was greater than the number of women remarrying per 1,000 people, showing that women were more likely to be getting married for the first time than getting remarried.