In [1]:

```
import pandas as pd

jan2021=pd.read_csv(r"C:\Users\HARDIK\Desktop\cycle-1.csv")
feb2021=pd.read_csv(r"C:\Users\HARDIK\Desktop\cycle-2.csv")
mar2021=pd.read_csv(r"C:\Users\HARDIK\Desktop\cycle-3.csv")
apr2021=pd.read_csv(r"C:\Users\HARDIK\Desktop\cycle-4.csv")
may2021=pd.read_csv(r"C:\Users\HARDIK\Desktop\cycle-5.csv")
jun2021=pd.read_csv(r"C:\Users\HARDIK\Desktop\cycle-6.csv")
jul2021=pd.read_csv(r"C:\Users\HARDIK\Desktop\cycle-7.csv")
aug2021=pd.read_csv(r"C:\Users\HARDIK\Desktop\cycle-8.csv")
sep2021=pd.read_csv(r"C:\Users\HARDIK\Desktop\cycle-9.csv")
oct2021=pd.read_csv(r"C:\Users\HARDIK\Desktop\cycle-10.csv")
nov2021=pd.read_csv(r"C:\Users\HARDIK\Desktop\cycle-11.csv")
dec2021=pd.read_csv(r"C:\Users\HARDIK\Desktop\cycle-12.csv")
```

In [2]:

```
str(jan2021)
str(feb2021)
str(mar2021)
str(apr2021)
str(may2021)
str(jun2021)
str(jul2021)
str(aug2021)
str(sep2021)
str(oct2021)
str(nov2021)
str(dec2021)
```

Out[2]:

```
'                 ride_id  rideable_type        started_at started_date
\\\n0       46F8167220E4431F  electric_bike  07-12-2021 15:06   2021-12-07
\n1       73A77762838B32FD  electric_bike  11-12-2021 03:43   2021-12-11
\n2       4CF42452054F59C5  electric_bike  15-12-2021 23:10   2021-12-15
\n3       3278BA87BF698339   classic_bike  26-12-2021 16:16   2021-12-26
\n4       6FF54232576A3B73  electric_bike  30-12-2021 11:31   2021-12-30
\n...                 ...            ...               ...          ...
\n247535  847431F3D5353AB7  electric_bike  12-12-2021 13:36   2021-12-12
\n247536  CF407BBC3B9FAD63  electric_bike  06-12-2021 19:37   2021-12-06
\n247537  60BB69EBF5440E92  electric_bike  02-12-2021 08:57   2021-12-02
\n247538  C414F654A28635B8  electric_bike  13-12-2021 09:00   2021-12-13
\n247539  37AC57E34B2E7E97   classic_bike  13-12-2021 08:45   2021-12-13
\n\n       started_time          ended_at  ended_date ended_time  \\\n0
15:06  07-12-2021 15:13  2021-12-07      15:13   \n1             03:43  11
-12-2021 04:10  2021-12-11      04:10   \n2             23:10  15-12-2021
23:23  2021-12-15      23:23   \n3             16:16  26-12-2021 16:30  20
21-12-26      16:30   \n4             11:31  30-12-2021 11:51  2021-12-30
11:51   \n...             ...               ...         ...        ...
\n247535        13:36  12-12-2021 13:56  2021-12-12      13:56   \n247536
19:37  06-12-2021 19:44  2021-12-06      19:44   \n247537        08:57  02
-12-2021 09:05  2021-12-02      09:05   \n247538        09:00  13-12-2021
09:14  2021-12-13      09:14   \n247539        08:45  13-12-2021 08:49  20
21-12-13      08:49   \n\n                  start_station_name start_stati
on_id  \\\n0           Laflin St & Cullerton St            13307   \n1
LaSalle Dr & Huron St     KP1705001026   \n2       Halsted St & North Bran
ch St     KA1504000117   \n3       Halsted St & North Branch St     KA1504
000117   \n4           Leavitt St & Chicago Ave            18058   \n...
...              ...   \n247535         Canal St & Madison St            1
3341   \n247536         Canal St & Madison St            13341   \n247537
Canal St & Madison St            13341   \n247538        Lawndale Ave & 16
th St              362   \n247539   Michigan Ave & Jackson Blvd     TA1309
000002   \n\n                  end_station_name end_station_id  start_lat
start_lng  \\\n0             Morgan St & Polk St   TA1307000130  41.85483
3 -87.663660   \n1       Clarendon Ave & Leland Ave   TA1307000119  41.894
405 -87.632331   \n2             Broadway & Barry Ave          13137  41.8
99357 -87.648522   \n3            LaSalle Dr & Huron St   KP1705001026  4
1.899390 -87.648545   \n4           Clark St & Drummond Pl   TA1307000142
41.895579 -87.682024   \n...                                ...           ...
...         ...   \n247535                          NaN           NaN  41.8
82289 -87.639752   \n247536    Kingsbury St & Kinzie St   KA1503000043  4
1.882123 -87.640053   \n247537     Dearborn St & Monroe St   TA1305000006
41.881956 -87.639955   \n247538                          NaN           NaN
41.860000 -87.720000   \n247539     Dearborn St & Monroe St   TA1305000006
41.877850 -87.624080   \n\n          end_lat    end_lng member_casual  \n0
41.871969 -87.650965        member  \n1       41.967968 -87.650001
casual  \n2       41.937582 -87.644098        member  \n3       41.894877
-87.632326        member  \n4       41.931248 -87.644336        member
\n...           ...        ...           ...  \n247535  41.890000 -87.6100
00        casual  \n247536  41.889106 -87.638862        member  \n247537
41.880254 -87.629603        member  \n247538  41.850000 -87.710000
member  \n247539  41.881320 -87.629521        member  \n\n[247540 rows x 1
7 columns]'
```

In [3]:

```
merged_df=pd.concat([jan2021,feb2021,mar2021,apr2021,may2021,jun2021,jul2021,aug2021,sep2
merged_df.head(3)
```

Out[3]:

	ride_id	rideable_type	started_at	started_date	started_time	ended_at	ended
0	E19E6F1B8D4C42ED	electric_bike	23-01-2021 16:14	2021-01-23	16:14	23-01-2021 16:24	2021-
1	DC88F20C2C55F27F	electric_bike	27-01-2021 18:43	2021-01-27	18:43	27-01-2021 18:47	2021-
2	EC45C94683FE3F27	electric_bike	21-01-2021 22:35	2021-01-21	22:35	21-01-2021 22:37	2021-

In [4]:

```
merged_df.dropna(inplace=True)
merged_df.dtypes
```

Out[4]:

```
ride_id               object
rideable_type         object
started_at            object
started_date          object
started_time          object
ended_at              object
ended_date            object
ended_time            object
start_station_name    object
start_station_id      object
end_station_name      object
end_station_id        object
start_lat            float64
start_lng            float64
end_lat              float64
end_lng              float64
member_casual         object
dtype: object
```

In [5]:

```
merged_df['started_date'] = merged_df['started_date'].astype('datetime64[ns]')
merged_df['started_time'] = merged_df['started_time'].astype('datetime64[ns]')
#merged_df['ended_time'] = merged_df['ended_time'].astype('datetime64[ns]')
merged_df['day_of_week'] = merged_df['started_date'].dt.day_name()
```

In [6]:

```
merged_df['hour']= merged_df.started_time.dt.hour
merged_df['month']=merged_df.started_date.dt.month
```

In [7]:

```
merged_df.head(3)
```

Out[7]:

	ride_id	rideable_type	started_at	started_date	started_time	ended_at	ended
9	B9F73448DFBE0D45	classic_bike	24-01-2021 19:15	2021-01-24	2023-08-22 19:15:00	24-01-2021 19:22	2021
10	457C7F4B5D3DA135	electric_bike	23-01-2021 12:57	2021-01-23	2023-08-22 12:57:00	23-01-2021 13:02	2021
11	57C750326F9FDABE	electric_bike	09-01-2021 15:28	2021-01-09	2023-08-22 15:28:00	09-01-2021 15:37	2021

In [8]:

```
import matplotlib.pyplot as plt
import seaborn as sns
```

In [9]:

```
import datetime as datetime
from datetime import timedelta
```

In [10]:

```
merged_df['ended_time'] = pd.to_datetime(merged_df['ended_time'], dayfirst = True)
```

In [11]:

```
merged_df.dtypes
```

Out[11]:

```
ride_id                     object
rideable_type               object
started_at                  object
started_date        datetime64[ns]
started_time        datetime64[ns]
ended_at                    object
ended_date                  object
ended_time          datetime64[ns]
start_station_name          object
start_station_id            object
end_station_name            object
end_station_id              object
start_lat                  float64
start_lng                  float64
end_lat                    float64
end_lng                    float64
member_casual               object
day_of_week                 object
hour                         int64
month                        int64
dtype: object
```

In [12]:

```
merged_df['total_ride_time']=merged_df['ended_time']-merged_df['started_time']
```

In [13]:

```
merged_df['total_ride_time']=(merged_df['total_ride_time'])/timedelta(minutes=1)
```

In [14]:

```
merged_df['total_ride_time']=merged_df['total_ride_time'].round(decimals=1)
```

In [15]:

```
merged_df.head(3)
```

Out[15]:

start_station_name	start_station_id	...	end_station_id	start_lat	start_lng	end_lat	enc
California Ave & Cortez St	17660	...	657	41.900363	-87.696704	41.899181	-87.67
California Ave & Cortez St	17660	...	13258	41.900406	-87.696733	41.910435	-87.69
California Ave & Cortez St	17660	...	657	41.900374	-87.696688	41.899180	-87.67

In [16]:

```
month={1: 'Jan',2:'Feb',3:'Mar',4:'Apr',5:'May',6:'Jun',7:'Jul',8:'Aug',9:'Sep',10:'Oct',
merged_df['Month_Name']=merged_df['month'].map(month)
merged_df['Month_Name'].head()
```

Out[16]:

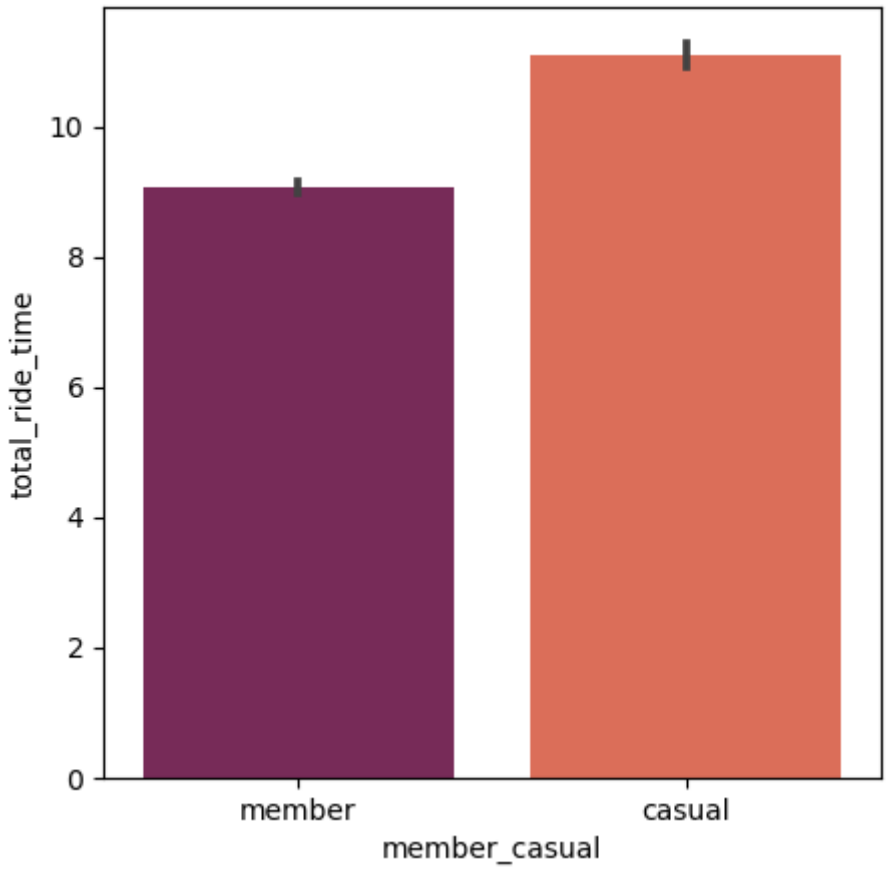
```
9     Jan
10    Jan
11    Jan
12    Jan
13    Jan
Name: Month_Name, dtype: object
```

In [23]:

```
plt.figure(figsize=(5,5))
sns.barplot(x='member_casual',y='total_ride_time',data=merged_df,palette='rocket')
```

Out[23]:

```
<Axes: xlabel='member_casual', ylabel='total_ride_time'>
```

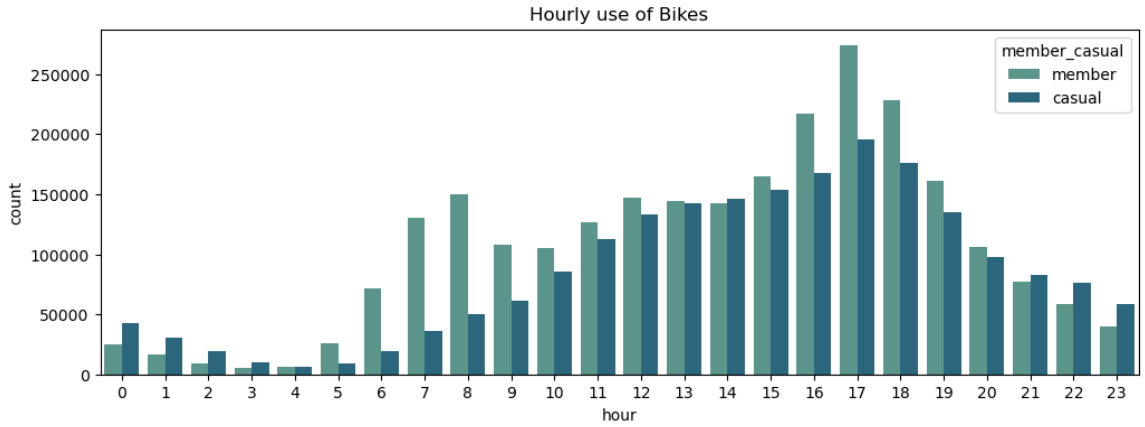


In [26]:

```
plt.figure(figsize=(12,4))
sns.countplot(x='hour',hue='member_casual',data=merged_df,palette='crest')
plt.title("Hourly use of Bikes")
```

Out[26]:

```
Text(0.5, 1.0, 'Hourly use of Bikes')
```

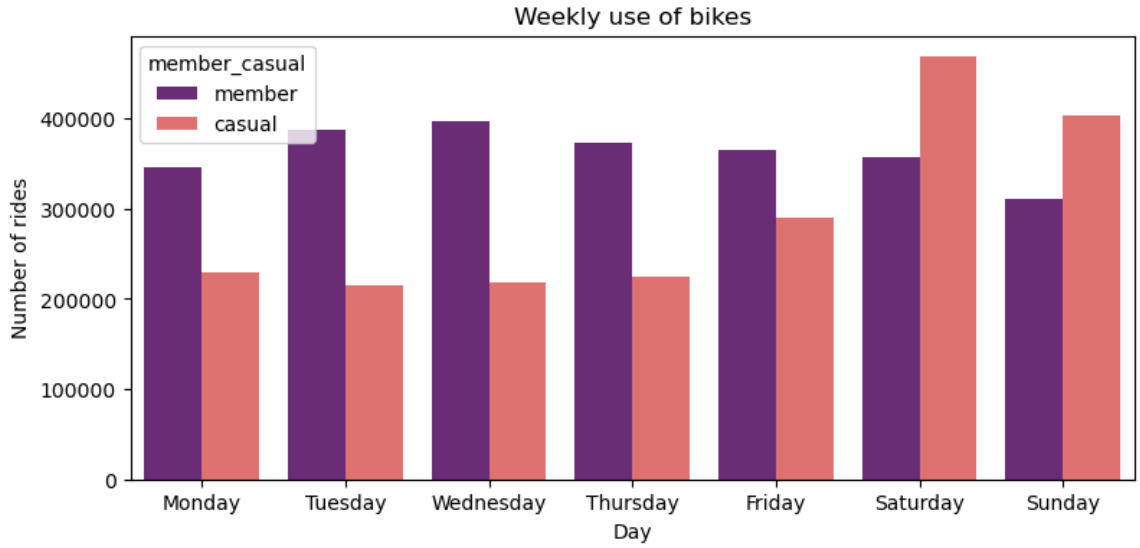


In [31]:

```
plt.figure(figsize=(9,4))
order=["Monday","Tuesday","Wednesday","Thursday","Friday","Saturday","Sunday"]
sns.countplot(x='day_of_week',hue='member_casual',data=merged_df,palette='magma',order=or
plt.title("Weekly use of bikes")
plt.xlabel("Day")
plt.ylabel("Number of rides")
```

Out[31]:

```
Text(0, 0.5, 'Number of rides')
```

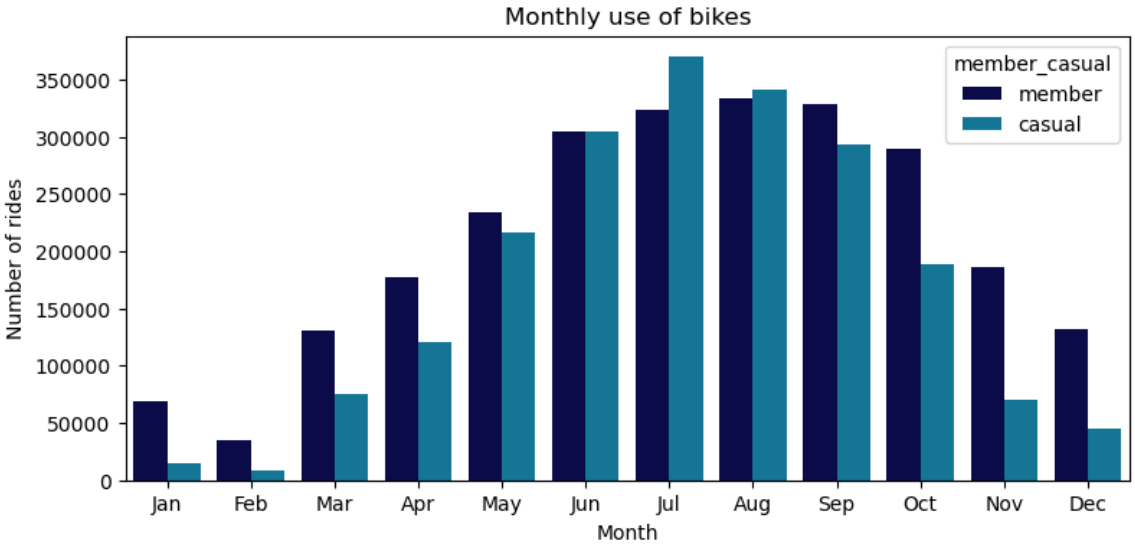


In [33]:

```
plt.figure(figsize=(9,4))
order=["Jan","Feb","Mar","Apr","May","Jun","Jul","Aug","Sep","Oct","Nov","Dec"]
sns.countplot(x='Month_Name',hue='member_casual',data=merged_df,palette='ocean',order=orc
plt.title("Monthly use of bikes")
plt.xlabel("Month")
plt.ylabel("Number of rides")
```

Out[33]:

```
Text(0, 0.5, 'Number of rides')
```



In [35]:

```
sunday=merged_df[merged_df['day_of_week']=="Sunday"]
monday=merged_df[merged_df['day_of_week']=="Monday"]
tuesday=merged_df[merged_df['day_of_week']=="Tuesday"]
wednesday=merged_df[merged_df['day_of_week']=="Wednesday"]
thursday=merged_df[merged_df['day_of_week']=="Thursday"]
friday=merged_df[merged_df['day_of_week']=="Friday"]
saturday=merged_df[merged_df['day_of_week']=="Saturday"]
```

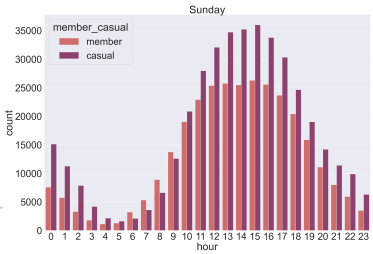
In [40]:

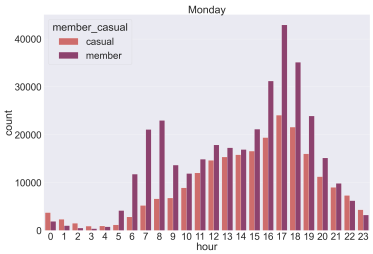
```
plt.figure(figsize=(90,60))
sns.set(font_scale=4)

plt.subplot(331)
sns.countplot(x='hour',hue='member_casual',data=sunday,palette='flare')
plt.title("Sunday")

plt.subplot(332)
sns.countplot(x='hour',hue='member_casual',data=monday,palette='flare')
plt.title("Monday")

plt.subplot(333)
sns.countplot(x='hour',hue='member_casual',data=tuesday,palette='flare')
plt.title("Tuesday")

plt.subplot(334)
sns.countplot(x='hour',hue='member_casual',data=wednesday,palette='flare')
plt.title("Wednesday")

plt.subplot(335)
sns.countplot(x='hour',hue='member_casual',data=thursday,palette='flare')
plt.title("Thursday")

plt.subplot(336)
sns.countplot(x='hour',hue='member_casual',data=friday,palette='flare')
plt.title("Friday")

plt.subplot(337)
sns.countplot(x='hour',hue='member_casual',data=saturday,palette='flare')
plt.title("Saturday")
```

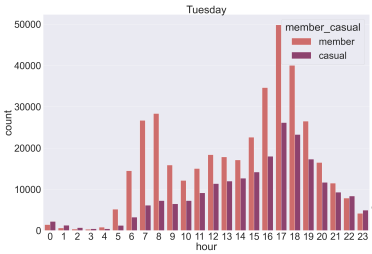
```
C:\Users\HARDIK\AppData\Local\Temp\ipykernel_3848\3411822391.py:6: Matplot
libDeprecationWarning: Auto-removal of overlapping axes is deprecated sinc
e 3.6 and will be removed two minor releases later; explicitly call ax.rem
ove() as needed.
  plt.subplot(331)
```

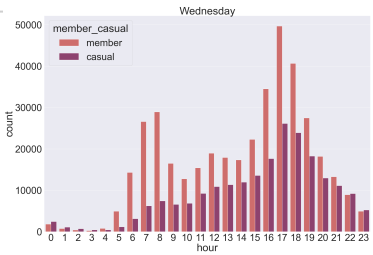
Out[40]:

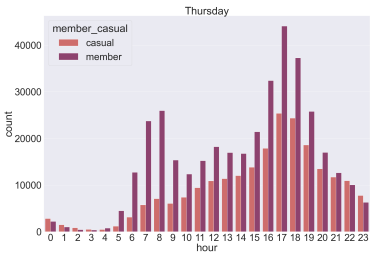
```
Text(0.5, 1.0, 'Saturday')
```

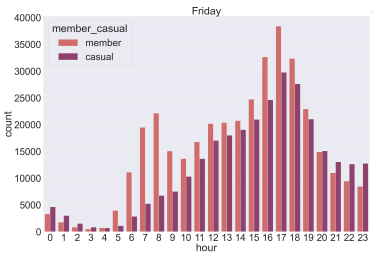

Sunday
member_casual
member
casual
count
hour


Monday
member_casual
casual
member
count
hour


Tuesday
member_casual
member
casual
count
hour


Wednesday
member_casual
member
casual
count
hour


Thursday
member_casual
casual
member
count
hour


Friday
member_casual
member
casual
count
hour