In [2]:
```
import numpy as np
import pandas as pd
import seaborn as sns
import os
```

In [3]:
```
activity = pd.read_csv('FitBit data.csv')
```

In [4]:
```
activity.shape
```

Out[4]:
```
(457, 15)
```

In [5]:
```
activity.isnull().sum() # checking the number of missing values in the dataset
```

Out[5]:
```
Id                          0
ActivityDate                0
TotalSteps                  0
TotalDistance               0
TrackerDistance             0
LoggedActivitiesDistance    0
VeryActiveDistance          0
ModeratelyActiveDistance    0
LightActiveDistance         0
SedentaryActiveDistance     0
VeryActiveMinutes           0
FairlyActiveMinutes         0
LightlyActiveMinutes        0
SedentaryMinutes            0
Calories                    0
dtype: int64
```

In [6]:
```
activity.head(10) # seeing a sample of 10 rows from the dataset
```

Out[6]:

	Id	ActivityDate	TotalSteps	TotalDistance	TrackerDistance	LoggedActivitiesDistance
0	1503960366	3/25/2016	11004	7.11	7.11	0.0
1	1503960366	3/26/2016	17609	11.55	11.55	0.0
2	1503960366	3/27/2016	12736	8.53	8.53	0.0
3	1503960366	3/28/2016	13231	8.93	8.93	0.0
4	1503960366	3/29/2016	12041	7.85	7.85	0.0
5	1503960366	3/30/2016	10970	7.16	7.16	0.0
6	1503960366	3/31/2016	12256	7.86	7.86	0.0
7	1503960366	4/1/2016	12262	7.87	7.87	0.0
8	1503960366	4/2/2016	11248	7.25	7.25	0.0
9	1503960366	4/3/2016	10016	6.37	6.37	0.0

In [7]:
```
activity1 = activity.copy() # copying the datset to activity1
```

In [8]:
```
activity1['ActivityDate'].unique() # checking out the unique activity dates in the
```

Out[8]:
```
array(['3/25/2016', '3/26/2016', '3/27/2016', '3/28/2016', '3/29/2016',
       '3/30/2016', '3/31/2016', '4/1/2016', '4/2/2016', '4/3/2016',
       '4/4/2016', '4/5/2016', '4/6/2016', '4/7/2016', '4/8/2016',
       '4/9/2016', '4/10/2016', '4/11/2016', '4/12/2016', '3/12/2016',
       '3/13/2016', '3/14/2016', '3/15/2016', '3/16/2016', '3/17/2016',
       '3/18/2016', '3/19/2016', '3/20/2016', '3/21/2016', '3/22/2016',
       '3/23/2016', '3/24/2016'], dtype=object)
```

In [9]:
```
activity1['ActivityDate'].head(10)  # cheking out the datset before transformation
```

Out[9]:
```
0    3/25/2016
1    3/26/2016
2    3/27/2016
3    3/28/2016
4    3/29/2016
5    3/30/2016
6    3/31/2016
7     4/1/2016
8     4/2/2016
9     4/3/2016
Name: ActivityDate, dtype: object
```

In [10]:
```
# adding the yearm month and date columns to the dataset
activity1['year'] = pd.DatetimeIndex(activity1['ActivityDate']).year
activity1['month'] = pd.DatetimeIndex(activity1['ActivityDate']).month
activity1['date'] = pd.DatetimeIndex(activity1['ActivityDate']).day
```

In [11]:
```
activity1.head(10) # cheking out the datset after transformation
```

Out[11]:

	Id	ActivityDate	TotalSteps	TotalDistance	TrackerDistance	LoggedActivitiesDistance
0	1503960366	3/25/2016	11004	7.11	7.11	0.0
1	1503960366	3/26/2016	17609	11.55	11.55	0.0
2	1503960366	3/27/2016	12736	8.53	8.53	0.0
3	1503960366	3/28/2016	13231	8.93	8.93	0.0
4	1503960366	3/29/2016	12041	7.85	7.85	0.0
5	1503960366	3/30/2016	10970	7.16	7.16	0.0
6	1503960366	3/31/2016	12256	7.86	7.86	0.0
7	1503960366	4/1/2016	12262	7.87	7.87	0.0
8	1503960366	4/2/2016	11248	7.25	7.25	0.0
9	1503960366	4/3/2016	10016	6.37	6.37	0.0

In [12]:
```
activity1=activity1.drop(['TrackerDistance'],axis=1)  #dropping the TrackerDistance
```

In [13]:
```
activity1.head(200) # cheking out the first 200 rows of the datset after transforma
```

Out[13]:

	Id	ActivityDate	TotalSteps	TotalDistance	LoggedActivitiesDistance	VeryActiveDista
0	1503960366	3/25/2016	11004	7.11	0.0	
1	1503960366	3/26/2016	17609	11.55	0.0	
2	1503960366	3/27/2016	12736	8.53	0.0	
3	1503960366	3/28/2016	13231	8.93	0.0	
4	1503960366	3/29/2016	12041	7.85	0.0	
...	...	...	...	...	...	
195	4020332650	4/11/2016	2993	2.15	0.0	
196	4020332650	4/12/2016	8	0.01	0.0	
197	4057192912	3/12/2016	0	0.00	0.0	
198	4057192912	3/13/2016	0	0.00	0.0	
199	4057192912	3/14/2016	8433	6.23	0.0	

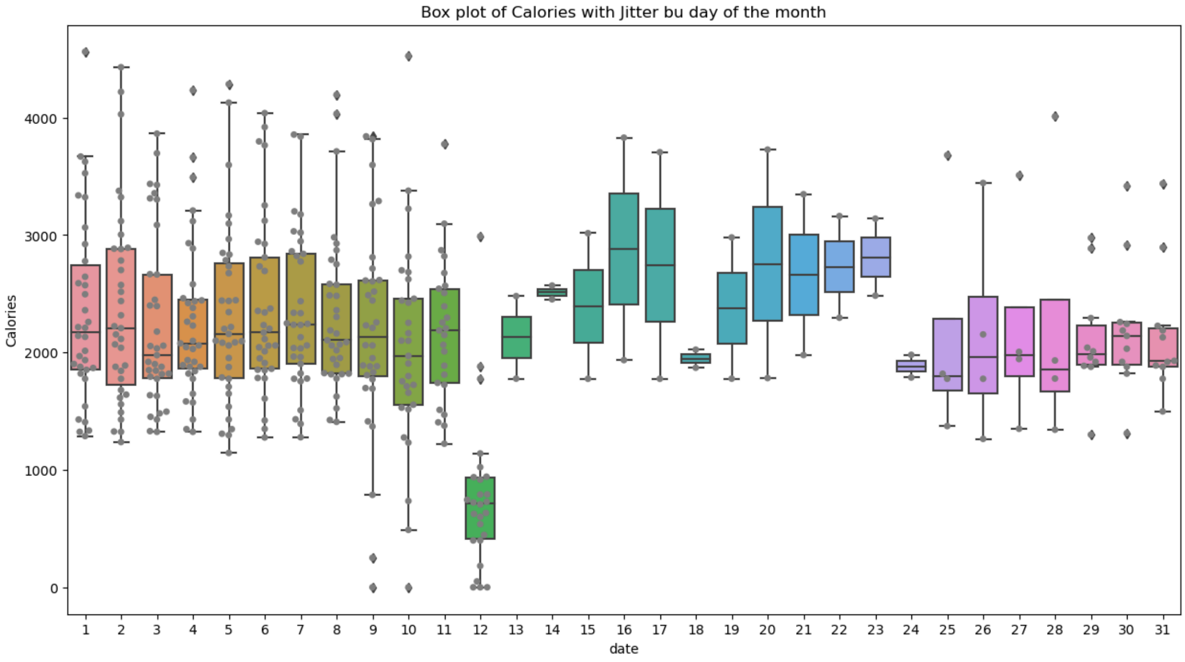
200 rows × 17 columns

In [14]:

```
### Groupby the day of the month and make a boxplot of calories burnt
import matplotlib.pyplot as plt
# figure size
plt.figure(figsize=(15,8))

# Usual boxplot
ax = sns.boxplot(x='date', y='Calories', data=activity1)

# Add jitter with the swarmplot function.
ax = sns.swarmplot(x='date', y='Calories', data=activity1, color="grey")

ax.set_title('Box plot of Calories with Jitter bu day of the month')
```

Out[14]:

```
Text(0.5, 1.0, 'Box plot of Calories with Jitter bu day of the month')
```



In [15]:
```
# converting the datatype to datetime
activity1['Week'] = pd.to_datetime(activity1.ActivityDate).dt.week
activity1['Year'] = pd.to_datetime(activity1.ActivityDate).dt.year
```

```
C:\Users\rahul\AppData\Local\Temp\ipykernel_9068\2972724497.py:2: FutureWarning: S
eries.dt.weekofyear and Series.dt.week have been deprecated. Please use Series.dt.
isocalendar().week instead.
  activity1['Week'] = pd.to_datetime(activity1.ActivityDate).dt.week
```

In [16]:
```
activity1.head()  # cheking out the datset after transformation
```

Out[16]:

	Id	ActivityDate	TotalSteps	TotalDistance	LoggedActivitiesDistance	VeryActiveDistanc
0	1503960366	3/25/2016	11004	7.11	0.0	2.5
1	1503960366	3/26/2016	17609	11.55	0.0	6.9
2	1503960366	3/27/2016	12736	8.53	0.0	4.6
3	1503960366	3/28/2016	13231	8.93	0.0	3.1
4	1503960366	3/29/2016	12041	7.85	0.0	2.1

In [17]:
```
activity1.ActivityDate.dtype # cheking the datatype of ActivityDate field
```

Out[17]:
```
dtype('O')
```

In [18]:
```
activity1['ActivityDate'] = pd.to_datetime(activity1['ActivityDate']) # converting
```

In [19]:
```
activity1['day'] = activity1['ActivityDate'].dt.weekday_name # converting the day c
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
~\AppData\Local\Temp\ipykernel_9068\3141696752.py in <module>
----> 1 activity1['day'] = activity1['ActivityDate'].dt.weekday_name # converting
the day of the week to the name of the day

AttributeError: 'DatetimeProperties' object has no attribute 'weekday_name'
```

In [ ]:
```
activity1.head(10) # cheking out the datset after transformation
```

In [ ]:
```
# figure size
plt.figure(figsize=(15,8))

# simple barplot
ax = sns.barplot(x='day', y='Calories',  data=activity1)

ax.set_title('Barplot of calories by the day of the week')
```

In [ ]:
```
# figure size
plt.figure(figsize=(15,8))

# Simple scatterplot
ax = sns.scatterplot(x='Calories', y='SedentaryMinutes', data=activity1)

ax.set_title('Scatterplot of calories and intense_activities')
```

In [ ]:
```
# figure size
plt.figure(figsize=(15,8))
```

```
# Simple scatterplot
ax = sns.scatterplot(x='Calories', y='LightlyActiveMinutes', data=activity1)

ax.set_title('Scatterplot of calories and intense_activities')
```

In [ ]:

```
# figure size
plt.figure(figsize=(15,8))

# Simple scatterplot between calories burnt in the moderately active minutes
ax = sns.scatterplot(x='Calories', y='FairlyActiveMinutes', data=activity1)

ax.set_title('Scatterplot of calories vs Fairly Active Minutes')
```

In [ ]:

```
# figure size
plt.figure(figsize=(15,8))

# Simple scatterplot between calories burnt in the intensely active minutes
ax = sns.scatterplot(x='Calories', y='VeryActiveMinutes', data=activity1)

ax.set_title('Scatterplot of calories and intense_activities')
```

In [ ]:

```
activity1.head(10) # cheking out the datset before transformation
```

In [20]:

```
activity1=activity1.drop(['Week','Year'],axis=1) # dropping the columns week and ye
```

In [21]:

```
activity1.head(10) # cheking out the datset after transformation
```

Out[21]:

	Id	ActivityDate	TotalSteps	TotalDistance	LoggedActivitiesDistance	VeryActiveDistanc
0	1503960366	2016-03-25	11004	7.11	0.0	2.5
1	1503960366	2016-03-26	17609	11.55	0.0	6.9
2	1503960366	2016-03-27	12736	8.53	0.0	4.6
3	1503960366	2016-03-28	13231	8.93	0.0	3.1
4	1503960366	2016-03-29	12041	7.85	0.0	2.1
5	1503960366	2016-03-30	10970	7.16	0.0	2.3
6	1503960366	2016-03-31	12256	7.86	0.0	2.2
7	1503960366	2016-04-01	12262	7.87	0.0	3.3
8	1503960366	2016-04-02	11248	7.25	0.0	3.0
9	1503960366	2016-04-03	10016	6.37	0.0	0.9

In [22]:

```
activity1.shape # cheking the number of rows and columns in the transformed  datase
```

Out[22]:

```
(457, 17)
```

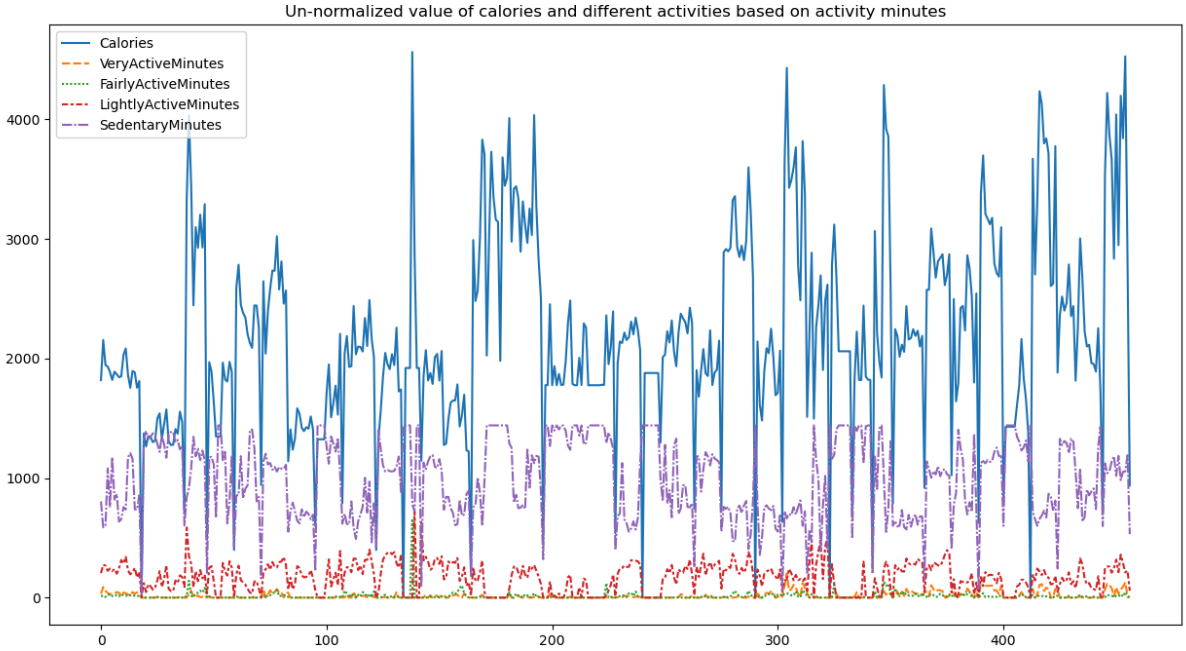
In [23]:

```
## plot the raw values

col_select = ['Calories','VeryActiveMinutes','FairlyActiveMinutes','LightlyActiveMi
wide_df = activity1[col_select]

# figure size
plt.figure(figsize=(15,8))

# timeseries plot using lineplot
```

```
ax = sns.lineplot(data=wide_df)

ax.set_title('Un-normalized value of calories and different activities based on act
```

Out[23]:

```
Text(0.5, 1.0, 'Un-normalized value of calories and different activities based on
activity minutes')
```

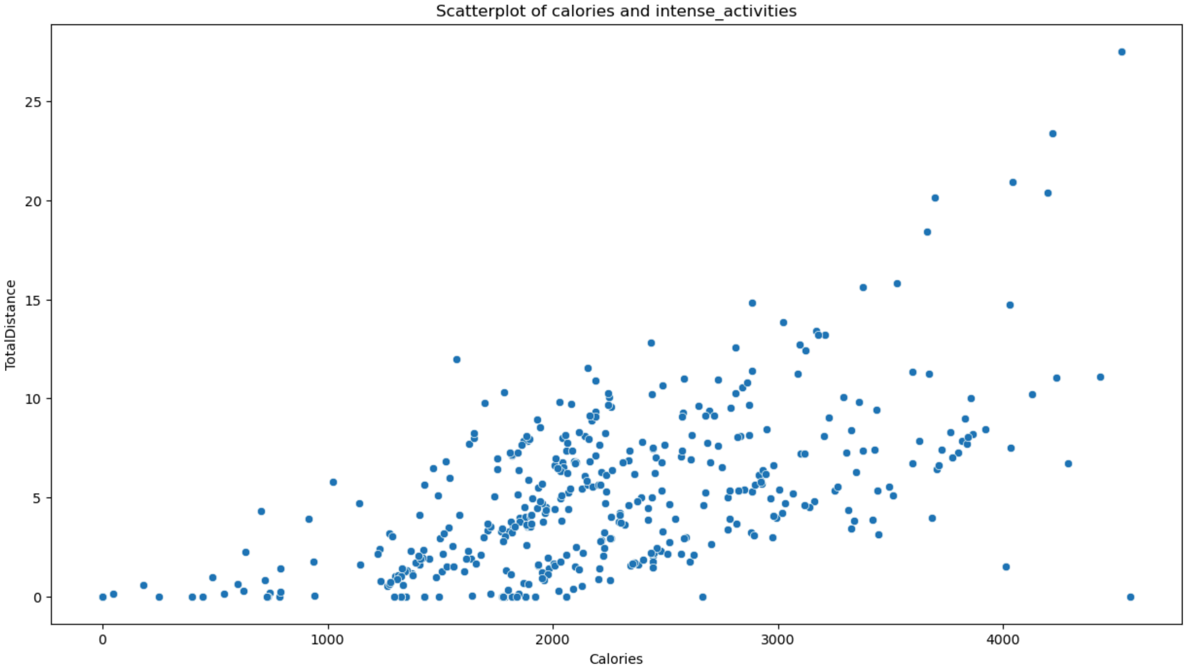


In [24]:

```
# figure size
plt.figure(figsize=(15,8))

# Simple scatterplot between  calories burnt and total distance covered
ax = sns.scatterplot(x='Calories', y='TotalDistance', data=activity1)

ax.set_title('Scatterplot of calories and intense_activities')
```

Out[24]:

```
Text(0.5, 1.0, 'Scatterplot of calories and intense_activities')
```



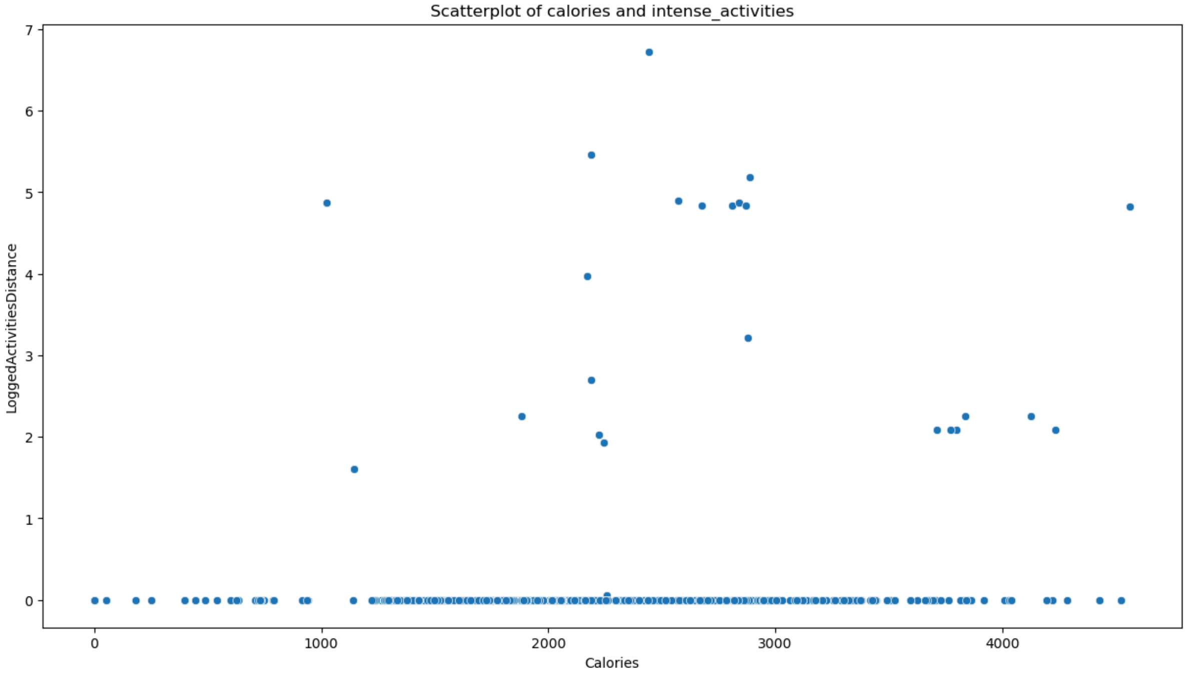
In [25]:

```
# figure size
plt.figure(figsize=(15,8))

# Simple scatterplot between calories burnt and the logged activities distance
ax = sns.scatterplot(x='Calories', y='LoggedActivitiesDistance', data=activity1)
```

```
ax.set_title('Scatterplot of calories and intense_activities')
```

Out[25]:

```
Text(0.5, 1.0, 'Scatterplot of calories and intense_activities')
```

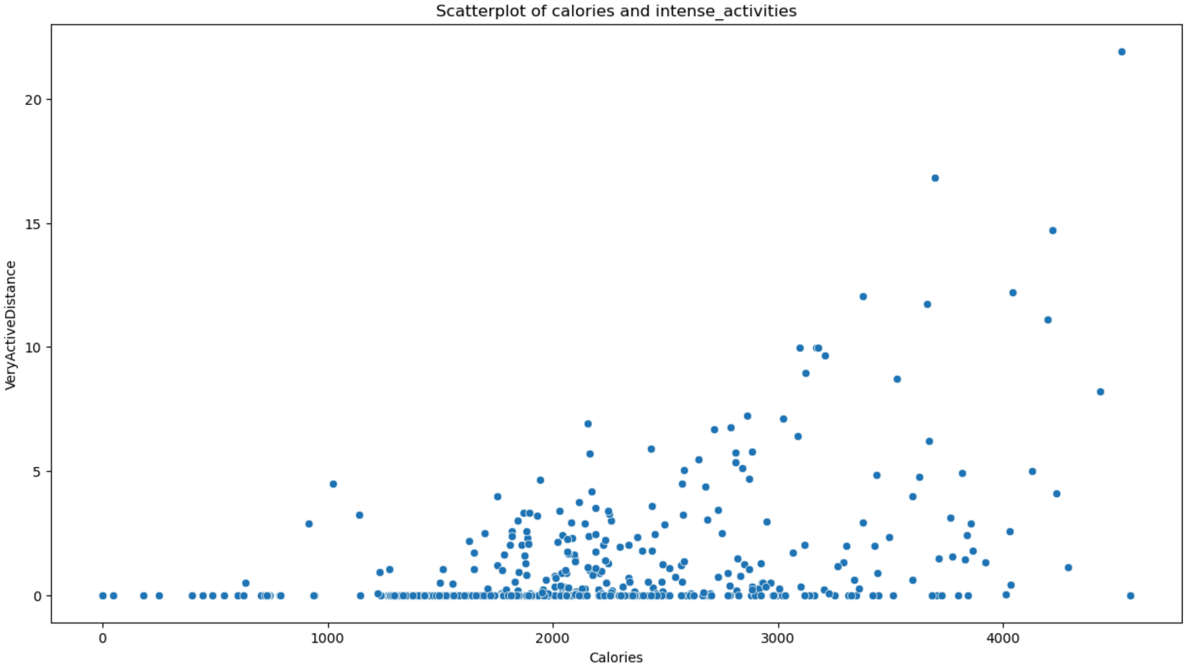


In [26]:

```
# figure size
plt.figure(figsize=(15,8))

# Simple scatterplot between calories burnt and the distance of intense activies
ax = sns.scatterplot(x='Calories', y='VeryActiveDistance', data=activity1)

ax.set_title('Scatterplot of calories and intense_activities')
```

Out[26]:

```
Text(0.5, 1.0, 'Scatterplot of calories and intense_activities')
```



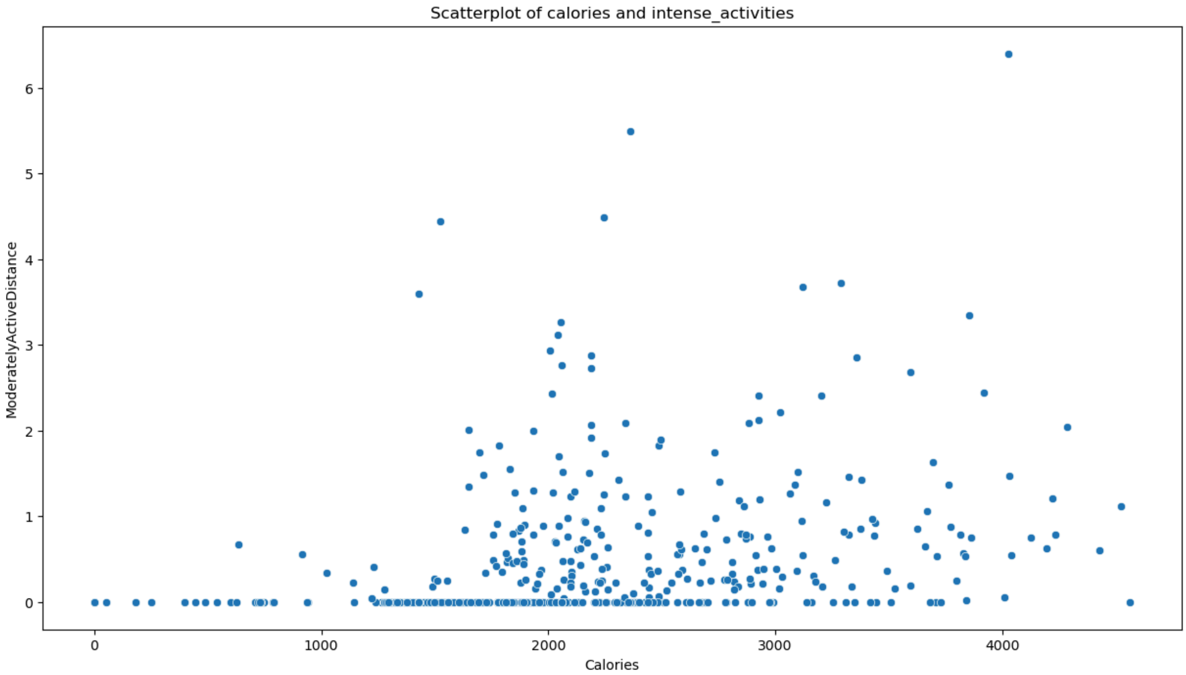
In [27]:

```
# figure size
plt.figure(figsize=(15,8))

# Simple scatterplot between calories burnt and the distance of moderate activies
ax = sns.scatterplot(x='Calories', y='ModeratelyActiveDistance', data=activity1)
```

```
ax.set_title('Scatterplot of calories and intense_activities')
```

Out[27]:

```
Text(0.5, 1.0, 'Scatterplot of calories and intense_activities')
```

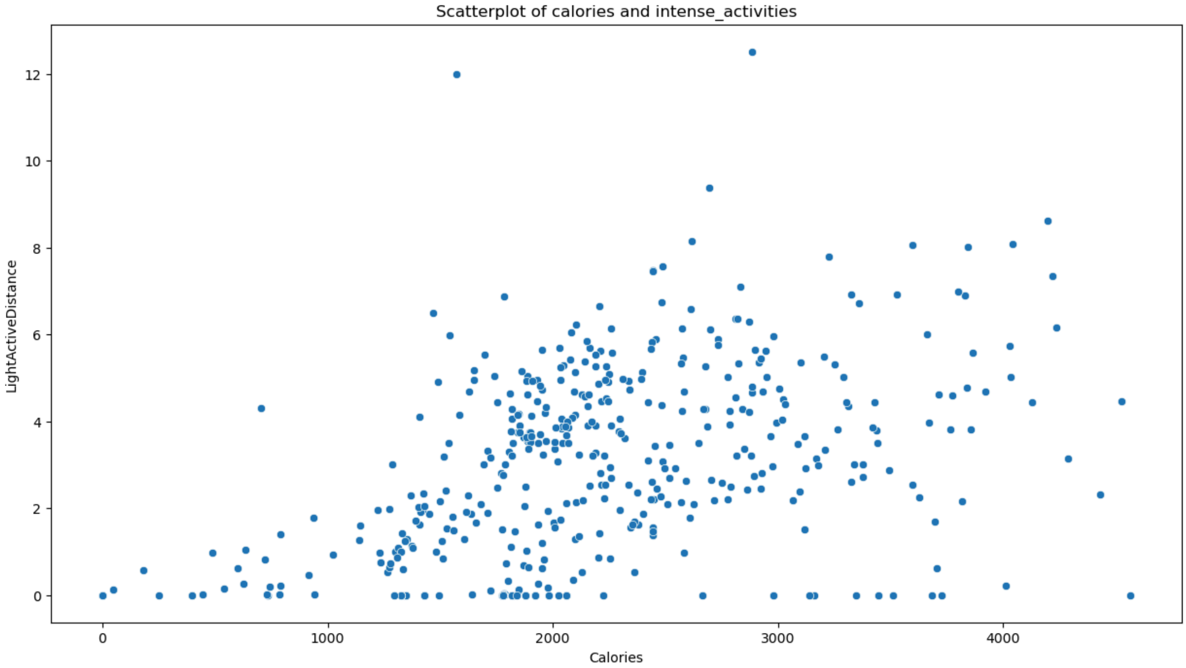


In [28]:

```
# figure size
plt.figure(figsize=(15,8))

# Simple scatterplot
ax = sns.scatterplot(x='Calories', y='LightActiveDistance', data=activity1)

ax.set_title('Scatterplot of calories and intense_activities')
```

Out[28]:

```
Text(0.5, 1.0, 'Scatterplot of calories and intense_activities')
```



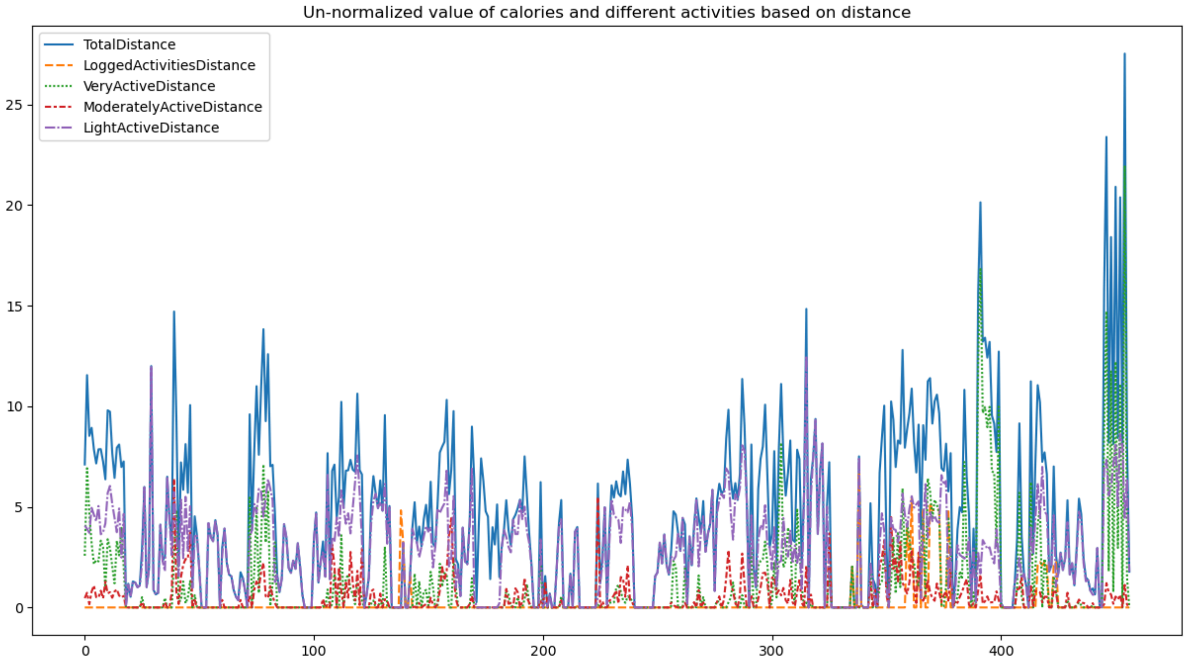
In [29]:

```
## plot the raw values

rol_select = ['TotalDistance','LoggedActivitiesDistance','VeryActiveDistance','Mode
wide_df1 = activity1[rol_select]

# figure size
```

```
plt.figure(figsize=(15,8))

# timeseries plot using lineplot
ax = sns.lineplot(data=wide_df1)

ax.set_title('Un-normalized value of calories and different activities based on dis
```

Out[29]:

```
Text(0.5, 1.0, 'Un-normalized value of calories and different activities based on
distance')
```



The EDA here gives us the insight about the relation between the active hours, the distance for which the user has moderate and intense activity and the calories burnt during that period.

In [ ]:

In [ ]: