udemy-course-learning-for-students

June 29, 2024

```python
[1]: import numpy as np
     import pandas as pd
     import matplotlib.pyplot as plt   # visualizing data
     import seaborn as sns
```

1   Loading and Reading the dataset

```python
[2]: df=pd.read_csv(r"C:\Users\nasee\Downloads\archive\udemy_courses.csv")
```

```python
[3]: df
```

```
[3]:       course_id                                       course_title  \
      0       1070968              Ultimate Investment Banking Course
      1       1113822  Complete GST Course & Certification - Grow You…
      2       1006314  Financial Modeling for Business Analysts and C…
      3       1210588  Beginner to Pro - Financial Analysis in Excel …
      4       1011058          How To Maximize Your Profits Trading Options
      …          …                                                 …
      3673     775618  Learn jQuery from Scratch - Master of JavaScri…
      3674    1088178  How To Design A WordPress Website With No Codi…
      3675     635248                      Learn and Build using Polymer
      3676     905096  CSS Animations: Create Amazing Effects on Your…
      3677     297602  Using MODX CMS to Build Websites: A Beginner's…

                                                       url  is_paid  price  \
      0       https://www.udemy.com/ultimate-investment-bank…     True    200
      1         https://www.udemy.com/goods-and-services-tax/     True     75
      2       https://www.udemy.com/financial-modeling-for-b…     True     45
      3       https://www.udemy.com/complete-excel-finance-c…     True     95
      4       https://www.udemy.com/how-to-maximize-your-pro…     True    200
      …                            …                              …      …
      3673    https://www.udemy.com/easy-jquery-for-beginner…     True    100
      3674    https://www.udemy.com/how-to-make-a-wordpress-…     True     25
      3675    https://www.udemy.com/learn-and-build-using-po…     True     40
      3676    https://www.udemy.com/css-animations-create-am…     True     50
      3677    https://www.udemy.com/using-modx-cms-to-build-…     True     45
```

```
     num_subscribers  num_reviews  num_lectures            level  \
0               2147           23            51        All Levels
1               2792          923           274        All Levels
2               2174           74            51  Intermediate Level
3               2451           11            36        All Levels
4               1276           45            26  Intermediate Level
...              ...          ...           ...               ...
3673            1040           14            21        All Levels
3674             306            3            42     Beginner Level
3675             513          169            48        All Levels
3676             300           31            38        All Levels
3677             901           36            20     Beginner Level

      content_duration   published_timestamp          subject
0                  1.5  2017-01-18T20:58:58Z  Business Finance
1                 39.0  2017-03-09T16:34:20Z  Business Finance
2                  2.5  2016-12-19T19:26:30Z  Business Finance
3                  3.0  2017-05-30T20:07:24Z  Business Finance
4                  2.0  2016-12-13T14:57:18Z  Business Finance
...                ...                   ...              ...
3673               2.0  2016-06-14T17:36:46Z  Web Development
3674               3.5  2017-03-10T22:24:30Z  Web Development
3675               3.5  2015-12-30T16:41:42Z  Web Development
3676               3.0  2016-08-11T19:06:15Z  Web Development
3677               2.0  2014-09-28T19:51:11Z  Web Development

[3678 rows x 12 columns]
```

2 Applying some basic functions

2.0.1 columns

```
[4]: df.columns
```

```
[4]: Index(['course_id', 'course_title', 'url', 'is_paid', 'price',
            'num_subscribers', 'num_reviews', 'num_lectures', 'level',
            'content_duration', 'published_timestamp', 'subject'],
           dtype='object')
```

```
[5]: # Rename column
     df.rename(columns={'course_title':'Title'},inplace=True)
```

```
[6]: df
```

```
[6]:        course_id                                      Title  \
       0      1070968                Ultimate Investment Banking Course
       1      1113822  Complete GST Course & Certification - Grow You…
       2      1006314  Financial Modeling for Business Analysts and C…
       3      1210588  Beginner to Pro - Financial Analysis in Excel …
       4      1011058          How To Maximize Your Profits Trading Options
       …          …                                            …
       3673    775618  Learn jQuery from Scratch - Master of JavaScri…
       3674   1088178  How To Design A WordPress Website With No Codi…
       3675    635248                       Learn and Build using Polymer
       3676    905096  CSS Animations: Create Amazing Effects on Your…
       3677    297602  Using MODX CMS to Build Websites: A Beginner's…


                                                     url  is_paid  price  \
       0        https://www.udemy.com/ultimate-investment-bank…     True    200
       1           https://www.udemy.com/goods-and-services-tax/     True     75
       2        https://www.udemy.com/financial-modeling-for-b…     True     45
       3        https://www.udemy.com/complete-excel-finance-c…     True     95
       4        https://www.udemy.com/how-to-maximize-your-pro…     True    200
       …                                                     …       …      …
       3673  https://www.udemy.com/easy-jquery-for-beginner…     True    100
       3674  https://www.udemy.com/how-to-make-a-wordpress-…     True     25
       3675  https://www.udemy.com/learn-and-build-using-po…     True     40
       3676  https://www.udemy.com/css-animations-create-am…     True     50
       3677  https://www.udemy.com/using-modx-cms-to-build-…     True     45


          num_subscribers  num_reviews  num_lectures              level  \
       0             2147           23            51          All Levels
       1             2792          923           274          All Levels
       2             2174           74            51   Intermediate Level
       3             2451           11            36          All Levels
       4             1276           45            26   Intermediate Level
       …               …            …             …                   …
       3673          1040           14            21          All Levels
       3674           306            3            42       Beginner Level
       3675           513          169            48          All Levels
       3676           300           31            38          All Levels
       3677           901           36            20       Beginner Level


          content_duration    published_timestamp           subject
       0               1.5  2017-01-18T20:58:58Z  Business Finance
       1              39.0  2017-03-09T16:34:20Z  Business Finance
       2               2.5  2016-12-19T19:26:30Z  Business Finance
       3               3.0  2017-05-30T20:07:24Z  Business Finance
       4               2.0  2016-12-13T14:57:18Z  Business Finance
       …                 …                    …                 …
       3673            2.0  2016-06-14T17:36:46Z   Web Development
```

```
3674                     3.5  2017-03-10T22:24:30Z    Web Development
3675                     3.5  2015-12-30T16:41:42Z    Web Development
3676                     3.0  2016-08-11T19:06:15Z    Web Development
3677                     2.0  2014-09-28T19:51:11Z    Web Development

[3678 rows x 12 columns]
```

2.0.2 Detailed information of rows and columns

```
[7]: df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 3678 entries, 0 to 3677
Data columns (total 12 columns):
 #   Column              Non-Null Count  Dtype
---  ------              --------------  -----
 0   course_id           3678 non-null   int64
 1   Title               3678 non-null   object
 2   url                 3678 non-null   object
 3   is_paid             3678 non-null   bool
 4   price               3678 non-null   int64
 5   num_subscribers     3678 non-null   int64
 6   num_reviews         3678 non-null   int64
 7   num_lectures        3678 non-null   int64
 8   level               3678 non-null   object
 9   content_duration    3678 non-null   float64
 10  published_timestamp 3678 non-null   object
 11  subject             3678 non-null   object
dtypes: bool(1), float64(1), int64(5), object(5)
memory usage: 319.8+ KB
```

2.0.3 shape of dataset

```
[8]: df.shape
```

```
[8]: (3678, 12)
```

2.0.4 First 5 records

```
[9]: df.head() # Top 5 rows
```

```
[9]:    course_id                                            Title  \
     0    1070968                   Ultimate Investment Banking Course
     1    1113822   Complete GST Course & Certification - Grow You…
     2    1006314   Financial Modeling for Business Analysts and C…
     3    1210588   Beginner to Pro - Financial Analysis in Excel …
     4    1011058           How To Maximize Your Profits Trading Options
```

```
                                           url  is_paid  price  \
0  https://www.udemy.com/ultimate-investment-bank…     True    200
1      https://www.udemy.com/goods-and-services-tax/    True     75
2  https://www.udemy.com/financial-modeling-for-b…     True     45
3  https://www.udemy.com/complete-excel-finance-c…     True     95
4  https://www.udemy.com/how-to-maximize-your-pro…     True    200

   num_subscribers  num_reviews  num_lectures               level  \
0             2147           23            51          All Levels
1             2792          923           274          All Levels
2             2174           74            51  Intermediate Level
3             2451           11            36          All Levels
4             1276           45            26  Intermediate Level

   content_duration     published_timestamp           subject
0              1.5  2017-01-18T20:58:58Z  Business Finance
1             39.0  2017-03-09T16:34:20Z  Business Finance
2              2.5  2016-12-19T19:26:30Z  Business Finance
3              3.0  2017-05-30T20:07:24Z  Business Finance
4              2.0  2016-12-13T14:57:18Z  Business Finance
```

2.0.5 last 5 records

```
[10]: df.tail() # 5 rows from the bottom
```

```
[10]:       course_id                                              Title  \
     3673     775618  Learn jQuery from Scratch - Master of JavaScri…
     3674    1088178  How To Design A WordPress Website With No Codi…
     3675     635248                     Learn and Build using Polymer
     3676     905096  CSS Animations: Create Amazing Effects on Your…
     3677     297602  Using MODX CMS to Build Websites: A Beginner's…

                                                  url  is_paid  price  \
     3673  https://www.udemy.com/easy-jquery-for-beginner…     True    100
     3674  https://www.udemy.com/how-to-make-a-wordpress-…     True     25
     3675  https://www.udemy.com/learn-and-build-using-po…     True     40
     3676  https://www.udemy.com/css-animations-create-am…     True     50
     3677  https://www.udemy.com/using-modx-cms-to-build-…     True     45

           num_subscribers  num_reviews  num_lectures           level  \
     3673             1040           14            21      All Levels
     3674              306            3            42  Beginner Level
     3675              513          169            48      All Levels
     3676              300           31            38      All Levels
     3677              901           36            20  Beginner Level
```

```
        content_duration    published_timestamp          subject
3673                 2.0    2016-06-14T17:36:46Z    Web Development
3674                 3.5    2017-03-10T22:24:30Z    Web Development
3675                 3.5    2015-12-30T16:41:42Z    Web Development
3676                 3.0    2016-08-11T19:06:15Z    Web Development
3677                 2.0    2014-09-28T19:51:11Z    Web Development
```

3   Data Cleaning

3.0.1   * Checking null values

```
[11]: pd.isnull(df)
```

```
[11]:       course_id   Title     url   is_paid   price   num_subscribers   num_reviews  \
      0         False   False   False     False   False             False         False
      1         False   False   False     False   False             False         False
      2         False   False   False     False   False             False         False
      3         False   False   False     False   False             False         False
      4         False   False   False     False   False             False         False
      ...         ...     ...     ...       ...     ...               ...           ...
      3673      False   False   False     False   False             False         False
      3674      False   False   False     False   False             False         False
      3675      False   False   False     False   False             False         False
      3676      False   False   False     False   False             False         False
      3677      False   False   False     False   False             False         False

            num_lectures   level   content_duration   published_timestamp   subject
      0            False   False              False                 False     False
      1            False   False              False                 False     False
      2            False   False              False                 False     False
      3            False   False              False                 False     False
      4            False   False              False                 False     False
      ...            ...     ...                ...                   ...       ...
      3673         False   False              False                 False     False
      3674         False   False              False                 False     False
      3675         False   False              False                 False     False
      3676         False   False              False                 False     False
      3677         False   False              False                 False     False

      [3678 rows x 12 columns]
```

```
[12]: pd.isnull(df).sum()
```

```
[12]: course_id            0
      Title                0
      url                  0
```

```
is_paid            0
price              0
num_subscribers    0
num_reviews        0
num_lectures       0
level              0
content_duration   0
published_timestamp 0
subject            0
dtype: int64
```

3.0.2 " There are no null values in this data set "

3.0.3 * Checking for duplicate records

```
[13]: df[df.duplicated()]
```

```
[13]:        course_id                                          Title  \
      787       837322  Essentials of money value: Get a financial Life !
      788      1157298  Introduction to Forex Trading Business For Beg…
      894      1035638                 Understanding Financial Statements
      1100     1084454                   CFA Level 2- Quantitative Methods
      1473      185526                           MicroStation - Células
      2561       28295  Learn Web Designing & HTML5/CSS3 Essentials in…

                                                  url  is_paid  price  \
      787      https://www.udemy.com/essentials-of-money-value/     True    20
      788    https://www.udemy.com/introduction-to-forex-tr…     True    20
      894    https://www.udemy.com/understanding-financial-…     True    25
      1100   https://www.udemy.com/cfa-level-2-quantitative…     True    40
      1473         https://www.udemy.com/microstation-celulas/     True    20
      2561   https://www.udemy.com/build-beautiful-html5-we…     True    75

             num_subscribers  num_reviews  num_lectures          level  \
      787                  0            0            20      All Levels
      788                  0            0            27  Beginner Level
      894                  0            0            10      All Levels
      1100                 0            0            35      All Levels
      1473                 0            0             9  Beginner Level
      2561             43285          525            24      All Levels

             content_duration  published_timestamp          subject
      787            0.616667  2016-05-16T18:28:30Z  Business Finance
      788            1.500000  2017-04-23T16:19:01Z  Business Finance
      894            1.000000  2016-12-15T14:56:17Z  Business Finance
      1100           5.500000  2017-07-02T14:29:35Z  Business Finance
      1473           0.616667  2014-04-15T21:48:55Z    Graphic Design
```

7

```
2561            4.000000  2013-01-03T00:55:31Z    Web Development
```

[14]: `len(df[df.duplicated()])`

[14]: 6

3.0.4 ” six duplicate records present ”

3.0.5 * Removing duplicates

[15]:
```
df.drop_duplicates(inplace=True)
df
```

[15]:
```
      course_id                                           Title  \
0       1070968                Ultimate Investment Banking Course
1       1113822  Complete GST Course & Certification - Grow You…
2       1006314  Financial Modeling for Business Analysts and C…
3       1210588  Beginner to Pro - Financial Analysis in Excel …
4       1011058         How To Maximize Your Profits Trading Options
…           …                                               …
3673     775618  Learn jQuery from Scratch - Master of JavaScri…
3674    1088178  How To Design A WordPress Website With No Codi…
3675     635248                        Learn and Build using Polymer
3676     905096  CSS Animations: Create Amazing Effects on Your…
3677     297602  Using MODX CMS to Build Websites: A Beginner's…

                                           url  is_paid  price  \
0     https://www.udemy.com/ultimate-investment-bank…     True    200
1         https://www.udemy.com/goods-and-services-tax/     True     75
2     https://www.udemy.com/financial-modeling-for-b…     True     45
3     https://www.udemy.com/complete-excel-finance-c…     True     95
4     https://www.udemy.com/how-to-maximize-your-pro…     True    200
…                                             …       …      …
3673  https://www.udemy.com/easy-jquery-for-beginner…     True    100
3674  https://www.udemy.com/how-to-make-a-wordpress-…     True     25
3675  https://www.udemy.com/learn-and-build-using-po…     True     40
3676  https://www.udemy.com/css-animations-create-am…     True     50
3677  https://www.udemy.com/using-modx-cms-to-build-…     True     45

      num_subscribers  num_reviews  num_lectures              level  \
0                2147           23            51          All Levels
1                2792          923           274          All Levels
2                2174           74            51  Intermediate Level
3                2451           11            36          All Levels
4                1276           45            26  Intermediate Level
…                   …            …             …                   …
3673             1040           14            21          All Levels
```

8

```
3674              306            3          42      Beginner Level
3675              513          169          48          All Levels
3676              300           31          38          All Levels
3677              901           36          20      Beginner Level

      content_duration   published_timestamp           subject
0                  1.5  2017-01-18T20:58:58Z  Business Finance
1                 39.0  2017-03-09T16:34:20Z  Business Finance
2                  2.5  2016-12-19T19:26:30Z  Business Finance
3                  3.0  2017-05-30T20:07:24Z  Business Finance
4                  2.0  2016-12-13T14:57:18Z  Business Finance
...                ...                   ...               ...
3673               2.0  2016-06-14T17:36:46Z   Web Development
3674               3.5  2017-03-10T22:24:30Z   Web Development
3675               3.5  2015-12-30T16:41:42Z   Web Development
3676               3.0  2016-08-11T19:06:15Z   Web Development
3677               2.0  2014-09-28T19:51:11Z   Web Development

[3672 rows x 12 columns]
```

3.0.6 * Checking again for duplicates

```
[16]: df[df.duplicated()]
```

```
[16]: Empty DataFrame
      Columns: [course_id, Title, url, is_paid, price, num_subscribers, num_reviews,
      num_lectures, level, content_duration, published_timestamp, subject]
      Index: []
```

3.0.7 " All duplicates removed "

3.0.8 Now our data set is clean and is ready for analysis

```
[56]: # change data type
      df['content_duration']=df['content_duration'].astype('int')
```

```
[57]: df['content_duration'].dtypes
```

```
[57]: dtype('int32')
```

```
[19]: # describe() method returns description of the data in the DataFrame
      df.describe()
```

```
[19]:            course_id         price  num_subscribers   num_reviews   num_lectures  \
      count   3.672000e+03   3672.000000      3672.000000   3672.000000    3672.000000
      mean    6.758977e+05     66.102941      3190.586874    156.371460      40.140251
      std     3.430720e+05     61.035920      9488.105448    936.178649      50.417102
```

```
min     8.324000e+03      0.000000          0.000000      0.000000      0.000000
25%     4.077615e+05     20.000000        111.750000      4.000000     15.000000
50%     6.876920e+05     45.000000        912.000000     18.000000     25.000000
75%     9.608140e+05     95.000000       2548.750000     67.000000     46.000000
max     1.282064e+06    200.000000     268923.000000  27445.000000    779.000000


        content_duration
count        3672.000000
mean            4.097603
std             6.057830
min             0.000000
25%             1.000000
50%             2.000000
75%             4.500000
max            78.500000
```

```python
[20]: # use describe() for specific columns
      df[['course_id','price']].describe()
```

```
[20]:            course_id         price
      count   3.672000e+03   3672.000000
      mean    6.758977e+05     66.102941
      std     3.430720e+05     61.035920
      min     8.324000e+03      0.000000
      25%     4.077615e+05     20.000000
      50%     6.876920e+05     45.000000
      75%     9.608140e+05     95.000000
      max     1.282064e+06    200.000000
```

4 Data Filtering

4.0.1 * Grouping

```python
[21]: ### Groupby
      gp = df.groupby('subject')
      gp
```

```
[21]: <pandas.core.groupby.generic.DataFrameGroupBy object at 0x0000024D97D84A00>
```

```python
[22]: gp.ngroups
```

```
[22]: 4
```

```python
[23]: gp.get_group('Web Development')
```

```
[23]:      course_id                                              Title  \
     2478      28295  Learn Web Designing & HTML5/CSS3 Essentials in…
     2479      19603  Learning Dynamic Website Design - PHP MySQL an…
     2480     889438  ChatBots: Messenger ChatBot with API.AI and No…
     2481     197836                              Projects in HTML5
     2482     505208  Programming Foundations: HTML5 + CSS3 for Entr…
     …           …                                                 …
     3673     775618  Learn jQuery from Scratch - Master of JavaScri…
     3674    1088178  How To Design A WordPress Website With No Codi…
     3675     635248                     Learn and Build using Polymer
     3676     905096  CSS Animations: Create Amazing Effects on Your…
     3677     297602  Using MODX CMS to Build Websites: A Beginner's…

                                                     url  is_paid  price  \
     2478  https://www.udemy.com/build-beautiful-html5-we…     True     75
     2479  https://www.udemy.com/learning-dynamic-website…     True     50
     2480                 https://www.udemy.com/chatbots/     True     50
     2481        https://www.udemy.com/projects-in-html5/     True     60
     2482          https://www.udemy.com/html-css-more/      True     20
     …                                                 …      …     …
     3673  https://www.udemy.com/easy-jquery-for-beginner…     True    100
     3674  https://www.udemy.com/how-to-make-a-wordpress-…     True     25
     3675  https://www.udemy.com/learn-and-build-using-po…     True     40
     3676  https://www.udemy.com/css-animations-create-am…     True     50
     3677  https://www.udemy.com/using-modx-cms-to-build-…     True     45

           num_subscribers  num_reviews  num_lectures             level  \
     2478            43285          525            24         All Levels
     2479            47886          285           125         All Levels
     2480             2577          529            64         All Levels
     2481             8777          206            75  Intermediate Level
     2482            23764          490            58      Beginner Level
     …                  …            …            …                 …
     3673             1040           14            21         All Levels
     3674              306            3            42      Beginner Level
     3675              513          169            48         All Levels
     3676              300           31            38         All Levels
     3677              901           36            20      Beginner Level

           content_duration   published_timestamp          subject
     2478               4.0  2013-01-03T00:55:31Z  Web Development
     2479              12.5  2012-06-18T16:52:34Z  Web Development
     2480               4.5  2016-06-30T16:57:08Z  Web Development
     2481              15.5  2014-06-17T05:43:50Z  Web Development
     2482               5.5  2015-10-17T04:52:25Z  Web Development
     …                   …                   …                …
     3673               2.0  2016-06-14T17:36:46Z  Web Development
```

```
3674                  3.5  2017-03-10T22:24:30Z  Web Development
3675                  3.5  2015-12-30T16:41:42Z  Web Development
3676                  3.0  2016-08-11T19:06:15Z  Web Development
3677                  2.0  2014-09-28T19:51:11Z  Web Development

[1199 rows x 12 columns]
```

4.0.2 1.Whate are the all Different subjects for which Udemy is offering course?

```
[24]: df.subject.unique()
```

```
[24]: array(['Business Finance', 'Graphic Design', 'Musical Instruments',
             'Web Development'], dtype=object)
```

4.0.3 2.Which subject has the maximum number of courses?

```
[25]: df.subject.value_counts()
```

```
[25]: Web Development        1199
      Business Finance       1191
      Musical Instruments     680
      Graphic Design          602
      Name: subject, dtype: int64
```

" Web Development has the maximum number of courses "

4.0.4 Sorting

```
[26]: df.sort_values('price',ascending=False)
      df.head(2)
```

```
[26]:    course_id                                        Title  \
      0    1070968                Ultimate Investment Banking Course
      1    1113822  Complete GST Course & Certification - Grow You…

                                          url  is_paid  price  \
      0  https://www.udemy.com/ultimate-investment-bank…    True    200
      1      https://www.udemy.com/goods-and-services-tax/    True     75

         num_subscribers  num_reviews  num_lectures      level  content_duration  \
      0             2147           23            51  All Levels               1.5
      1             2792          923           274  All Levels              39.0

          published_timestamp           subject
      0  2017-01-18T20:58:58Z  Business Finance
      1  2017-03-09T16:34:20Z  Business Finance
```

12

4.0.5 3.Show all the courses which are Free of cost?

```
[27]: df[df.is_paid==False]
```

```
[27]:       course_id                                          Title  \
      95      1148774                Options Trading 101: The Basics
      103      133536            Stock Market Investing for Beginners
      106      265960                    Fundamentals of Forex Trading
      108      923616  Website Investing 101 - Buying & Selling Onlin…
      112      191854                        Stock Market Foundations
      …          …                                              …
      3638     155640            Building a Search Engine in PHP & MySQL
      3643     366720  CSS Image filters - The modern web images colo…
      3651    1079078                            Drupal 8 Site Building
      3665      21386            Beginner Photoshop to HTML5 and CSS3
      3668     270976                          A how to guide in HTML


                                                  url  is_paid  price  \
      95    https://www.udemy.com/options-trading-101-the-…   False      0
      103   https://www.udemy.com/the-beginners-guide-to-t…   False      0
      106   https://www.udemy.com/fundamentals-of-forex-tr…   False      0
      108   https://www.udemy.com/cash-flow-website-invest…   False      0
      112   https://www.udemy.com/how-to-invest-in-the-sto…   False      0
      …                                              …       …      …
      3638  https://www.udemy.com/creating-a-search-engine…   False      0
      3643  https://www.udemy.com/super-awesome-images-wit…   False      0
      3651      https://www.udemy.com/drupal-8-site-building/   False      0
      3665              https://www.udemy.com/psd-html5-css3/   False      0
      3668      https://www.udemy.com/a-how-to-guide-in-html/   False      0


            num_subscribers  num_reviews  num_lectures          level  \
      95               1514           66            11  Beginner Level
      103             50855         2698            15  Beginner Level
      106             17160          620            23      All Levels
      108              6811          151            51      All Levels
      112             19339          794             9  Beginner Level
      …                   …            …             …              …
      3638            10110          379            12      All Levels
      3643             6315           53            16      All Levels
      3651             1942           23            48      All Levels
      3665            73110         1716            22      All Levels
      3668             7318          205             8  Beginner Level


            content_duration  published_timestamp           subject
      95            0.550000  2017-03-23T22:19:57Z  Business Finance
      103           1.500000  2013-12-25T19:53:34Z  Business Finance
      106           1.000000  2014-08-29T20:10:38Z  Business Finance
```

```
108                2.000000  2016-08-05T17:03:15Z   Business Finance
112                2.000000  2014-03-31T21:35:06Z   Business Finance
…                       …                     …                …
3638               2.500000  2014-02-03T18:07:52Z   Web Development
3643               1.500000  2014-12-10T19:43:40Z   Web Development
3651               4.500000  2017-05-02T05:15:52Z   Web Development
3665               2.000000  2012-07-27T12:54:57Z   Web Development
3668               0.583333  2014-08-10T20:19:10Z   Web Development

[310 rows x 12 columns]
```

4.0.6 4.Show all the courses which are Paid.

```
[28]: df[df.is_paid==True]
```

```
[28]:       course_id                                          Title  \
      0        1070968              Ultimate Investment Banking Course
      1        1113822  Complete GST Course & Certification - Grow You…
      2        1006314  Financial Modeling for Business Analysts and C…
      3        1210588  Beginner to Pro - Financial Analysis in Excel …
      4        1011058        How To Maximize Your Profits Trading Options
      …            …                                              …
      3673      775618  Learn jQuery from Scratch - Master of JavaScri…
      3674     1088178  How To Design A WordPress Website With No Codi…
      3675      635248                    Learn and Build using Polymer
      3676      905096  CSS Animations: Create Amazing Effects on Your…
      3677      297602  Using MODX CMS to Build Websites: A Beginner's…

                                                    url  is_paid  price  \
      0     https://www.udemy.com/ultimate-investment-bank…     True    200
      1         https://www.udemy.com/goods-and-services-tax/    True     75
      2     https://www.udemy.com/financial-modeling-for-b…     True     45
      3     https://www.udemy.com/complete-excel-finance-c…     True     95
      4     https://www.udemy.com/how-to-maximize-your-pro…     True    200
      …                                                 …        …      …
      3673  https://www.udemy.com/easy-jquery-for-beginner…     True    100
      3674  https://www.udemy.com/how-to-make-a-wordpress-…     True     25
      3675  https://www.udemy.com/learn-and-build-using-po…     True     40
      3676  https://www.udemy.com/css-animations-create-am…     True     50
      3677  https://www.udemy.com/using-modx-cms-to-build-…     True     45

            num_subscribers  num_reviews  num_lectures             level  \
      0                2147           23            51         All Levels
      1                2792          923           274         All Levels
      2                2174           74            51  Intermediate Level
      3                2451           11            36         All Levels
      4                1276           45            26  Intermediate Level
```

```
...           ...          ...          ...              ...
3673          1040          14           21       All Levels
3674           306           3           42    Beginner Level
3675           513         169           48       All Levels
3676           300          31           38       All Levels
3677           901          36           20    Beginner Level

      content_duration   published_timestamp           subject
0                  1.5  2017-01-18T20:58:58Z  Business Finance
1                 39.0  2017-03-09T16:34:20Z  Business Finance
2                  2.5  2016-12-19T19:26:30Z  Business Finance
3                  3.0  2017-05-30T20:07:24Z  Business Finance
4                  2.0  2016-12-13T14:57:18Z  Business Finance
...                ...                   ...               ...
3673               2.0  2016-06-14T17:36:46Z   Web Development
3674               3.5  2017-03-10T22:24:30Z   Web Development
3675               3.5  2015-12-30T16:41:42Z   Web Development
3676               3.0  2016-08-11T19:06:15Z   Web Development
3677               2.0  2014-09-28T19:51:11Z   Web Development

[3362 rows x 12 columns]
```

4.0.7 5.Which are Top Selling Courses ?

```
[29]: df.sort_values('num_subscribers',ascending=False)
```

```
[29]:       course_id                                             Title  \
      2827      41295             Learn HTML5 Programming From Scratch
      3032      59014                   Coding for Entrepreneurs Basic
      3230     625204                        The Web Developer Bootcamp
      2783     173548  Build Your First Website in 1 Week with HTML5 …
      3232     764164             The Complete Web Developer Course 2.0
      ...         ...                                               ...
      1234     185526                         MicroStation – Células
      886     1087466  Stop Creditors from Harassing you and Avoid Ba…
      887     1058852             Learn to trade using technical analysis
      888     1083744  How to Invest Using ETFs from Former Wall Stre…
      777     1215926               Kickstarter success in 5 easy steps

                                                        url  is_paid  price  \
      2827  https://www.udemy.com/learn-html5-programming-…    False      0
      3032  https://www.udemy.com/coding-for-entrepreneurs…    False      0
      3230  https://www.udemy.com/the-web-developer-bootcamp/     True    200
      2783  https://www.udemy.com/build-your-first-website…    False      0
      3232  https://www.udemy.com/the-complete-web-develop…     True    200
      ...                                                 ...      ...    ...
      1234        https://www.udemy.com/microstation-celulas/     True     20
```

```
886    https://www.udemy.com/stop-creditor-harassment…    True    20
887    https://www.udemy.com/learn-to-trade-using-tec…    True    50
888              https://www.udemy.com/etf-master-class/    True    200
777    https://www.udemy.com/kickstarter-success-in-5…    True    20
```

```
      num_subscribers  num_reviews  num_lectures              level  \
2827           268923         8629            45         All Levels
3032           161029          279            27     Beginner Level
3230           121584        27445           342         All Levels
2783           120291         5924            30     Beginner Level
3232           114512        22412           304         All Levels
…                 …            …             …                  …
1234                0            0             9     Beginner Level
886                 0            0             7     Beginner Level
887                 0            0             6  Intermediate Level
888                 0            0            10         All Levels
777                 0            0            12         All Levels
```

```
      content_duration  published_timestamp              subject
2827          10.500000  2013-02-14T07:03:41Z    Web Development
3032           3.500000  2013-06-09T15:51:55Z    Web Development
3230          43.000000  2015-11-02T21:13:27Z    Web Development
2783           3.000000  2014-04-08T16:21:30Z    Web Development
3232          30.500000  2016-03-08T22:28:36Z    Web Development
…                    …                     …                  …
1234           0.616667  2014-04-15T21:48:55Z     Graphic Design
886            0.616667  2017-02-02T16:22:37Z   Business Finance
887            0.533333  2017-05-02T13:15:53Z   Business Finance
888            2.000000  2017-02-15T22:34:00Z   Business Finance
777            0.516667  2017-05-16T14:55:28Z   Business Finance

[3672 rows x 12 columns]
```

4.0.8 6.Which are Least Selling Courses ?

```python
[30]: df.sort_values('num_subscribers',ascending=True)
```

```
[30]:       course_id                                        Title  \
      458     1258666              Financial Statement Auditing Cycles
      2400    1026762  Coaching Course: Rhythm Instruction for Music …
      2401    1234656                              4 Week Rhythm Mastery
      1236    1177156       Como Criar Logos de Sucesso - Start Designer
      1237     177614                        Super Textos con Photoshop
      …           …                                                  …
      3232     764164              The Complete Web Developer Course 2.0
      2783     173548  Build Your First Website in 1 Week with HTML5 …
      3230     625204                         The Web Developer Bootcamp
```

```
3032      59014                    Coding for Entrepreneurs Basic
2827      41295              Learn HTML5 Programming From Scratch


                                                    url  is_paid  price  \
458   https://www.udemy.com/financial-statement-audi…     True     50
2400  https://www.udemy.com/coaching-bundle-rhythm-i…     True    125
2401        https://www.udemy.com/4-week-rhythm-mastery/   True     20
1236  https://www.udemy.com/como-criar-logos-de-suce…     True     25
1237  https://www.udemy.com/super-textos-con-photoshop/   True     20
…                                                     …      …     …
3232  https://www.udemy.com/the-complete-web-develop…     True    200
2783  https://www.udemy.com/build-your-first-website…    False      0
3230  https://www.udemy.com/the-web-developer-bootcamp/  True    200
3032  https://www.udemy.com/coding-for-entrepreneurs…    False      0
2827  https://www.udemy.com/learn-html5-programming-…    False      0


      num_subscribers  num_reviews  num_lectures              level  \
458                 0            0             9  Intermediate Level
2400                0            0             7          All Levels
2401                0            0            28      Beginner Level
1236                0            0            29      Beginner Level
1237                0            0             8      Beginner Level
…                   …            …             …                 …
3232           114512        22412           304          All Levels
2783           120291         5924            30      Beginner Level
3230           121584        27445           342          All Levels
3032           161029          279            27      Beginner Level
2827           268923         8629            45          All Levels


      content_duration  published_timestamp             subject
458           2.000000  2017-06-29T23:20:10Z    Business Finance
2400          0.633333  2017-03-10T17:06:46Z  Musical Instruments
2401          2.500000  2017-07-05T16:07:44Z  Musical Instruments
1236          6.000000  2017-06-30T05:48:57Z       Graphic Design
1237          2.000000  2014-03-31T20:31:04Z       Graphic Design
…                    …                     …                   …
3232         30.500000  2016-03-08T22:28:36Z     Web Development
2783          3.000000  2014-04-08T16:21:30Z     Web Development
3230         43.000000  2015-11-02T21:13:27Z     Web Development
3032          3.500000  2013-06-09T15:51:55Z     Web Development
2827         10.500000  2013-02-14T07:03:41Z     Web Development

[3672 rows x 12 columns]
```

4.0.9 7.Show all courses of Graphic Design where the price is below 100 ?

```
[31]: df[(df.subject=='Graphic Design')&(df.price<100)]
```

```
[31]:       course_id                                            Title  \
      1196    1197206                        Illustrator CC MasterClass
      1198    1219520   Adobe Illustrator T-Shirt Design for Merch by …
      1202      28556              Discover How to Draw and paint Comics
      1203     317278   Typographic Logos: Typography and Lettering fo…
      1204     573064   Photoshop in Ease: Create World Amazing  Graph…
      …           …                                                  …
      1793     456388            Adobe Photoshop CC | The Essential Guide
      1794     955242     Learn to Composite a 2D Action Shot in Photoshop
      1795     496430   Infographic Design: How To Create Your Own Inf…
      1796     793246            Autodesk Inventor 2016 : Complete Guide
      1797     547190                Amazing Graphic Design for Beginners


                                                      url  is_paid  price  \
      1196  https://www.udemy.com/illustrator-cc-masterclass/      True     95
      1198          https://www.udemy.com/merchbyamazondesign/      True     20
      1202       https://www.udemy.com/learn-to-draw-and-paint/      True     65
      1203  https://www.udemy.com/typographic-logos-typogr…      True     25
      1204  https://www.udemy.com/photoshop-knights-become…      True     20
      …                                                  …       …      …
      1793  https://www.udemy.com/adobe-photoshop-cc-the-e…      True     20
      1794  https://www.udemy.com/3dmotive-learn-to-compos…      True     20
      1795  https://www.udemy.com/infographic-design-how-t…      True     20
      1796  https://www.udemy.com/learn-autodesk-inventor-…      True     20
      1797  https://www.udemy.com/amazing-graphic-design-f…      True     20


            num_subscribers  num_reviews  num_lectures              level  \
      1196              462           50            86          All Levels
      1198              390           44            15          All Levels
      1202             8901          424            85          All Levels
      1203             4235          427            20   Intermediate Level
      1204            14440          182            26          All Levels
      …                  …            …             …                   …
      1793              254            5            81          All Levels
      1794               40            2             8      Beginner Level
      1795               84            8            13          All Levels
      1796               23            4            83      Beginner Level
      1797               32           10             5      Beginner Level


            content_duration  published_timestamp           subject
      1196              12.0  2017-05-02T16:41:21Z  Graphic Design
      1198               1.0  2017-06-13T20:41:14Z  Graphic Design
      1202              62.0  2012-11-21T22:03:54Z  Graphic Design
```

```
1203                 1.5  2014-10-16T19:30:01Z   Graphic Design
1204                 3.0  2015-08-13T21:17:34Z   Graphic Design
…                    …                    …              …
1793                 4.5  2015-05-12T00:19:27Z   Graphic Design
1794                 1.5  2016-09-10T21:38:26Z   Graphic Design
1795                 2.0  2015-05-12T20:38:58Z   Graphic Design
1796                 7.5  2016-03-22T20:35:56Z   Graphic Design
1797                 0.7  2015-07-08T19:58:01Z   Graphic Design

[484 rows x 12 columns]
```

4.0.10   8.List out all the courses that are related to 'Finance'?

```
[32]: df[df.Title.str.contains('Finance')]
```

```
[32]:      course_id                                      Title  \
      37      888716   Introduction to Finance, Accounting, Modeling …
      41     1035472   Python for Finance: Investment Fundamentals & …
      76      834558   What Finance Job is for You? Explanation of 14…
     128      777444                Corporate Finance - A Brief Introduction
     217      537878                          CFA Corporate Finance Level 2
     233      619296                   CFA: Fast Track your career in Finance
     236      267984   Accounting 101: Learn Business Finance Forecas…
     272       46927                           Basics of Business Finance
     306      517938   Algorithmic Trading in MATLAB: WFAToolbox App …
     310      806122                Learn and Master the Basics of Finance
     326      797762   Corporate Finance 101: Financial Statement Ana…
     337      213154                            Automate Your Finances
     338      484132   MBA Accounting and Finance for Managers(Paper …
     343      323196                       Master Finance in Three Hours
     349      757450   Bulletproof Personal Finance: Expert Asset All…
     356      471440   Accounting and Finance for Bankers - A Compreh…
     395      489146                             Practical Finance
     398      109622          Finance - Ratios Analysis & Interpretations
     456     1247992   Introduction to Project Management for Finance…
     472      280842   Take Your Career to the Next Level with MBA Fi…
     528      455452   Accounting, Finance and Banking - A Comprehens…
     542      607800          Introduction To The World Of Equity Finance
     554      854764   Indian Contract Act 1872: Must for all Finance…
     591      229360      Level 1 2014 CFA® Program - Corporate Finance
     594      570996         Finance Fundamentals for Non Finance Leaders
     606      865630          Aprenda Cálculo Financeiro de Forma Simples
     608     1180960                            Estruturação Financeira
     643       74016   CFA Level I Workshop 5: Corp Finance, Quants I…
     673       53211              Matemática Financeira de um jeito fácil
     688      364428              CFA Corporate Finance Level 1 (Part 1)
     705      804298              Corporate Finance 101: Equity Valuation
```

```
735       595258        Finance for Non-Finance: Learn Quick and Easy
748       835212   The Fundamentals Of Finance For Non-Finance Pr…
755      1016996   Introduction to Corporate Finance (Mergers & A…
839       443502                       Essential Finance For Managers
851       612528   Corporate Finance and Alternative Investment f…
909       941310          Matemática Financeira com HP12C e MS Excel
948       422918     Essentials of Finance and Investment in 2 hours
963       160322                      Basics of Finance and Budgeting
983      1110256   QuickBooks Online : Inventory Management For N…
1054      720994   Gestão Financeira Para Pequenas e Médias Empresas
1079      953432                         Easy Finance For Startups
1102     1251654   Understand Core Finance Principles in 60 Minutes
1105      123242                    Surviving Introduction to Finance
1124       32908              Finance and Accounting for Startups
1144       42146         Advanced Finance and Accounting for Startups
1158      692268   Learn Business Finance: Win more work as a Bus…
1168      455120   Life Coach Business Basics: Finance and Operat…
1187      249934                  Finance for Non Finance Executives

                                             url  is_paid  price  \
37      https://www.udemy.com/introduction-to-accounti…    True    200
41      https://www.udemy.com/python-for-finance-inves…    True    195
76      https://www.udemy.com/what-finance-job-is-for-…    True    200
128     https://www.udemy.com/finance-a-brief-introduc…   False      0
217     https://www.udemy.com/advanced-capital-budgeti…    True     50
233              https://www.udemy.com/cfapreparebetter/    True     20
236     https://www.udemy.com/cashflow-forecasting-mad…    True     95
272     https://www.udemy.com/basics-of-business-finance/    True     30
306     https://www.udemy.com/algorithmic-trading-with…    True     20
310               https://www.udemy.com/finance-101/      True     20
326       https://www.udemy.com/corp-fin-101-fsa-ratios/    True     50
337     https://www.udemy.com/automate-your-personal-f…    True     20
338     https://www.udemy.com/dividend-decision-a-comp…    True    150
343     https://www.udemy.com/basic-finance-for-startu…    True     20
349     https://www.udemy.com/bulletproof-personal-fin…    True     45
356     https://www.udemy.com/crash-course-on-financia…    True    180
395           https://www.udemy.com/practical-finance/    True     20
398            https://www.udemy.com/financial-ratios/    True     30
456     https://www.udemy.com/introduction-to-project-…    True     50
472     https://www.udemy.com/take-your-career-to-the-…    True     50
528     https://www.udemy.com/accounting-finance-and-b…    True    180
542       https://www.udemy.com/equity-finance-basics/    True     20
554     https://www.udemy.com/indian-contract-act-1872…    True     20
591     https://www.udemy.com/level-1-2014-cfa-program…    True     40
594     https://www.udemy.com/finance-fundamentals-for…    True     20
606     https://www.udemy.com/aprenda-calculo-financei…    True     20
608       https://www.udemy.com/estruturacao-financeira/    True     45
```

```
643                  https://www.udemy.com/cfa-workshop-5/       True     20
673          https://www.udemy.com/matematica-financeira2/       True     95
688       https://www.udemy.com/learn-cost-of-capital-of…       True    180
705       https://www.udemy.com/corp-fin-101-equity-valu…       True     50
735       https://www.udemy.com/finance-for-non-financia…       True     20
748          https://www.udemy.com/finance-for-nonfinance/       True     40
755       https://www.udemy.com/introduction-to-corporat…      False      0
839            https://www.udemy.com/finance-for-managers/       True     25
851       https://www.udemy.com/corporate-finance-and-al…       True     20
909       https://www.udemy.com/matematica-financeira-co…       True     20
948           https://www.udemy.com/finance-hien-minh-luu/       True     20
963       https://www.udemy.com/basics-of-finance-and-bu…       True     20
983       https://www.udemy.com/quickbooks-online-invent…       True     35
1054             https://www.udemy.com/gestao-financeira/       True    115
1079       https://www.udemy.com/easy-finance-for-startups/       True     50
1102      https://www.udemy.com/core-finance-principles-…       True     75
1105      https://www.udemy.com/surviving-introduction-t…      False      0
1124      https://www.udemy.com/finance-and-accounting-f…       True     50
1144      https://www.udemy.com/advanced-finance-and-acc…       True     40
1158      https://www.udemy.com/essential-business-finan…       True     20
1168      https://www.udemy.com/how-to-run-a-business-bu…       True    195
1187      https://www.udemy.com/finance-for-non-finance-…       True    180

      num_subscribers  num_reviews  num_lectures            level  \
37              11441         1118            61       All Levels
41               3811          278           103       All Levels
76               2951          232            60       All Levels
128             11724          649            17   Beginner Level
217              2474            6           128       All Levels
233              1393           27            21   Beginner Level
236              1730           12            12       All Levels
272              4855           64            24   Beginner Level
306              1749           41            21       All Levels
310                43           17            39   Beginner Level
326               967           16            43       All Levels
337               690           17            21   Beginner Level
338              1340            4           272       All Levels
343               721           12            29   Beginner Level
349              1119           22            18       All Levels
356              3056            9           316       All Levels
395              4497          281            11       All Levels
398             10338           52            41   Beginner Level
456                 0            0             9   Beginner Level
472               618           10            19       All Levels
528               507           36           395       All Levels
542                29            9            32       All Levels
554               605            3            14       All Levels
```

591	204	1	18	All Levels
594	37	7	15	All Levels
606	76	14	21	All Levels
608	18	3	18	All Levels
643	110	1	5	All Levels
673	401	67	20	All Levels
688	621	1	107	All Levels
705	1071	14	50	All Levels
735	4158	51	30	Beginner Level
748	206	3	7	All Levels
755	2080	83	30	Beginner Level
839	663	10	79	All Levels
851	103	3	27	All Levels
909	74	17	30	Beginner Level
948	1403	6	14	Beginner Level
963	578	7	34	Beginner Level
983	8	4	10	All Levels
1054	1284	230	45	All Levels
1079	9	4	6	Beginner Level
1102	0	0	13	Beginner Level
1105	1362	7	13	Beginner Level
1124	1175	92	75	All Levels
1144	188	7	48	Intermediate Level
1158	741	4	22	Beginner Level
1168	397	4	54	All Levels
1187	944	44	187	Beginner Level

	content_duration	published_timestamp	subject
37	4.500000	2016-06-28T06:12:23Z	Business Finance
41	6.500000	2017-03-30T22:17:09Z	Business Finance
76	4.000000	2016-05-04T05:22:32Z	Business Finance
128	1.500000	2016-03-04T05:58:09Z	Business Finance
217	17.500000	2015-07-07T20:35:21Z	Business Finance
233	2.000000	2015-09-29T20:12:53Z	Business Finance
236	1.500000	2014-07-24T15:20:39Z	Business Finance
272	4.000000	2013-03-22T17:42:18Z	Business Finance
306	1.000000	2015-06-23T22:37:31Z	Business Finance
310	3.000000	2016-09-25T20:37:51Z	Business Finance
326	8.000000	2016-03-20T21:39:38Z	Business Finance
337	1.000000	2014-05-08T23:09:32Z	Business Finance
338	26.000000	2015-07-19T19:43:52Z	Business Finance
343	3.000000	2014-10-28T20:48:49Z	Business Finance
349	1.000000	2016-02-10T04:57:32Z	Business Finance
356	24.500000	2015-04-10T19:24:28Z	Business Finance
395	1.000000	2015-07-14T18:14:16Z	Business Finance
398	2.500000	2013-10-23T18:34:25Z	Business Finance
456	2.000000	2017-07-03T21:40:32Z	Business Finance

```
472        2.000000  2015-10-29T23:18:23Z  Business Finance
528       33.000000  2015-03-26T18:01:39Z  Business Finance
542        2.000000  2015-12-08T17:12:06Z  Business Finance
554        1.000000  2016-05-20T17:19:02Z  Business Finance
591        3.000000  2014-06-21T05:43:33Z  Business Finance
594        1.000000  2015-08-04T21:56:58Z  Business Finance
606        2.000000  2016-06-02T18:09:38Z  Business Finance
608        3.500000  2017-05-08T02:40:04Z  Business Finance
643        1.000000  2013-08-12T13:54:47Z  Business Finance
673        1.500000  2013-07-23T20:45:33Z  Business Finance
688       14.500000  2014-12-06T07:44:46Z  Business Finance
705        6.000000  2016-03-29T19:40:05Z  Business Finance
735        2.500000  2016-02-25T21:48:39Z  Business Finance
748        1.500000  2016-05-18T16:02:21Z  Business Finance
755        1.500000  2017-02-28T16:14:06Z  Business Finance
839        5.500000  2015-04-16T20:10:00Z  Business Finance
851        4.500000  2015-09-17T18:09:49Z  Business Finance
909        4.500000  2016-10-12T13:50:11Z  Business Finance
948        2.000000  2015-06-01T21:48:13Z  Business Finance
963        6.000000  2014-05-19T04:02:10Z  Business Finance
983        0.666667  2017-04-20T22:15:19Z  Business Finance
1054       4.500000  2016-01-29T01:16:05Z  Business Finance
1079       0.666667  2016-10-16T21:15:15Z  Business Finance
1102       2.500000  2017-06-29T22:04:17Z  Business Finance
1105       3.000000  2014-02-06T03:58:39Z  Business Finance
1124      12.500000  2013-01-15T02:01:23Z  Business Finance
1144       6.500000  2014-02-27T17:58:02Z  Business Finance
1158       2.000000  2016-01-03T22:45:32Z  Business Finance
1168       3.500000  2015-08-27T23:35:24Z  Business Finance
1187      13.000000  2014-06-25T15:09:12Z  Business Finance
```

[33]: `len(df[df.Title.str.contains('Finance')])`

[33]: 49

4.0.11 9.What are courses that were published in the year 2015 ?

[34]: `df.dtypes`

[34]:
```
course_id            int64
Title               object
url                 object
is_paid               bool
price                int64
num_subscribers      int64
num_reviews          int64
num_lectures         int64
```

```
level               object
content_duration    float64
published_timestamp  object
subject             object
dtype: object
```

[35]: `df['published_timestamp ']=pd.to_datetime(df.published_timestamp )`

[36]: `df.dtypes`

[36]:
```
course_id                         int64
Title                            object
url                              object
is_paid                            bool
price                            int64
num_subscribers                  int64
num_reviews                      int64
num_lectures                     int64
level                            object
content_duration                 float64
published_timestamp              object
subject                          object
published_timestamp     datetime64[ns, UTC]
dtype: object
```

[37]: `df['year'] =df['published_timestamp '].dt.year`

[38]: `df`

[38]:
```
      course_id                                          Title  \
0       1070968              Ultimate Investment Banking Course
1       1113822  Complete GST Course & Certification - Grow You…
2       1006314  Financial Modeling for Business Analysts and C…
3       1210588  Beginner to Pro - Financial Analysis in Excel …
4       1011058          How To Maximize Your Profits Trading Options
…           …                                              …
3673     775618  Learn jQuery from Scratch - Master of JavaScri…
3674    1088178  How To Design A WordPress Website With No Codi…
3675     635248                     Learn and Build using Polymer
3676     905096  CSS Animations: Create Amazing Effects on Your…
3677     297602  Using MODX CMS to Build Websites: A Beginner's…


                                        url  is_paid  price  \
0       https://www.udemy.com/ultimate-investment-bank…    True    200
1           https://www.udemy.com/goods-and-services-tax/    True     75
2       https://www.udemy.com/financial-modeling-for-b…    True     45
3       https://www.udemy.com/complete-excel-finance-c…    True     95
```

24

```
4      https://www.udemy.com/how-to-maximize-your-pro…      True      200
…                                                       …       …    …
3673   https://www.udemy.com/easy-jquery-for-beginner…      True      100
3674   https://www.udemy.com/how-to-make-a-wordpress-…      True       25
3675   https://www.udemy.com/learn-and-build-using-po…      True       40
3676   https://www.udemy.com/css-animations-create-am…      True       50
3677   https://www.udemy.com/using-modx-cms-to-build-…      True       45


       num_subscribers  num_reviews  num_lectures              level  \
0                 2147           23            51          All Levels
1                 2792          923           274          All Levels
2                 2174           74            51   Intermediate Level
3                 2451           11            36          All Levels
4                 1276           45            26   Intermediate Level
…                    …            …             …                   …
3673              1040           14            21          All Levels
3674               306            3            42      Beginner Level
3675               513          169            48          All Levels
3676               300           31            38          All Levels
3677               901           36            20      Beginner Level


       content_duration   published_timestamp           subject  \
0                   1.5  2017-01-18T20:58:58Z  Business Finance
1                  39.0  2017-03-09T16:34:20Z  Business Finance
2                   2.5  2016-12-19T19:26:30Z  Business Finance
3                   3.0  2017-05-30T20:07:24Z  Business Finance
4                   2.0  2016-12-13T14:57:18Z  Business Finance
…                     …                     …                 …
3673                2.0  2016-06-14T17:36:46Z   Web Development
3674                3.5  2017-03-10T22:24:30Z   Web Development
3675                3.5  2015-12-30T16:41:42Z   Web Development
3676                3.0  2016-08-11T19:06:15Z   Web Development
3677                2.0  2014-09-28T19:51:11Z   Web Development


            published_timestamp  year
0     2017-01-18 20:58:58+00:00  2017
1     2017-03-09 16:34:20+00:00  2017
2     2016-12-19 19:26:30+00:00  2016
3     2017-05-30 20:07:24+00:00  2017
4     2016-12-13 14:57:18+00:00  2016
…                             …     …
3673  2016-06-14 17:36:46+00:00  2016
3674  2017-03-10 22:24:30+00:00  2017
3675  2015-12-30 16:41:42+00:00  2015
3676  2016-08-11 19:06:15+00:00  2016
3677  2014-09-28 19:51:11+00:00  2014
```

```
[3672 rows x 14 columns]
```

[39]: `df[df.year==2015]`

[39]:
```
      course_id                                          Title  \
7        403100  Trading Stock Chart Patterns For Immediate, Ex…
8        476268  Options Trading 3 : Advanced Stock Profit and …
10       592338  Forex Trading Secrets of the Pros With Amazon'…
15       504036  Short Selling: Learn To Sell Stocks Before The…
17       564966  The Complete Chart Pattern Trading Course: A P…
…           …                                               …
3659     577796  Simple Javascript: Learn by Doing, Beginners W…
3667     523216  The Fastest Way to Create a Website Using Godaddy
3669     679992                  Building Better APIs with GraphQL
3671     667122  Build A Stock Downloader With Visual Studio 20…
3675     635248                    Learn and Build using Polymer

                                          url  is_paid  price  \
7     https://www.udemy.com/trading-chart-patterns-f…    True     95
8     https://www.udemy.com/day-trading-stock-option…    True    195
10    https://www.udemy.com/trading-with-amazons-aws…    True    200
15    https://www.udemy.com/short-selling-learn-to-s…    True     75
17    https://www.udemy.com/make-money-trading-stock…    True    200
…                                          …     …      …
3659  https://www.udemy.com/simple-javascript-learn-…    True     25
3667     https://www.udemy.com/create-your-own-website/    True     30
3669  https://www.udemy.com/building-better-apis-wit…    True     50
3671  https://www.udemy.com/csharpyahoostockdownloader/    True     20
3675  https://www.udemy.com/learn-and-build-using-po…    True     40

      num_subscribers  num_reviews  num_lectures               level  \
7                2917          148            23           All Levels
8                5172           34            38         Expert Level
10               4284           93            76           All Levels
15               2276          106            19   Intermediate Level
17               2666          115            52           All Levels
…                   …            …             …                    …
3659             2753           10            18           All Levels
3667             1454           14            12        Beginner Level
3669              555           89            16           All Levels
3671              436           36            22   Intermediate Level
3675              513          169            48           All Levels

      content_duration    published_timestamp            subject  \
7                  2.5   2015-01-30T22:13:03Z   Business Finance
8                  2.5   2015-05-28T00:14:03Z   Business Finance
10                 5.0   2015-09-11T16:47:02Z   Business Finance
```

```
15                      1.5   2015-06-22T21:18:35Z   Business Finance
17                      4.0   2015-08-10T21:07:35Z   Business Finance
...                     ...                     ...              ...
3659                    2.0   2015-09-07T17:55:11Z   Web Development
3667                    0.5   2015-11-09T20:44:25Z   Web Development
3669                    2.5   2015-11-29T22:02:02Z   Web Development
3671                    1.5   2015-11-19T17:22:47Z   Web Development
3675                    3.5   2015-12-30T16:41:42Z   Web Development

          published_timestamp   year
7      2015-01-30 22:13:03+00:00   2015
8      2015-05-28 00:14:03+00:00   2015
10     2015-09-11 16:47:02+00:00   2015
15     2015-06-22 21:18:35+00:00   2015
17     2015-08-10 21:07:35+00:00   2015
...                          ...    ...
3659   2015-09-07 17:55:11+00:00   2015
3667   2015-11-09 20:44:25+00:00   2015
3669   2015-11-29 22:02:02+00:00   2015
3671   2015-11-19 17:22:47+00:00   2015
3675   2015-12-30 16:41:42+00:00   2015

[1014 rows x 14 columns]
```

4.0.12 10.What is the Max. Number of Subscribers for Each Level of courses ?

```
[40]: df.level.unique()
```

```
[40]: array(['All Levels', 'Intermediate Level', 'Beginner Level',
             'Expert Level'], dtype=object)
```

```
[41]: df.groupby('level')['num_subscribers'].max()
```

```
[41]: level
      All Levels            268923
      Beginner Level        161029
      Expert Level            5172
      Intermediate Level     29167
      Name: num_subscribers, dtype: int64
```

4.0.13 ” All Level has maximum number of subscribers ”

5 Visualizations

5.0.1 1.Courses Analysis

```
[42]: paid_perc=df['is_paid'].value_counts(normalize=True)
      print(paid_perc)

      plt.figure(figsize=(5,4))
      plt.title('paid courses count')
      plt.bar(['paid','not paid'],df['is_paid'].value_counts(),edgecolor='k',width=0.
       ↪7)
      plt.show()
```

```
True     0.915577
False    0.084423
Name: is_paid, dtype: float64
```
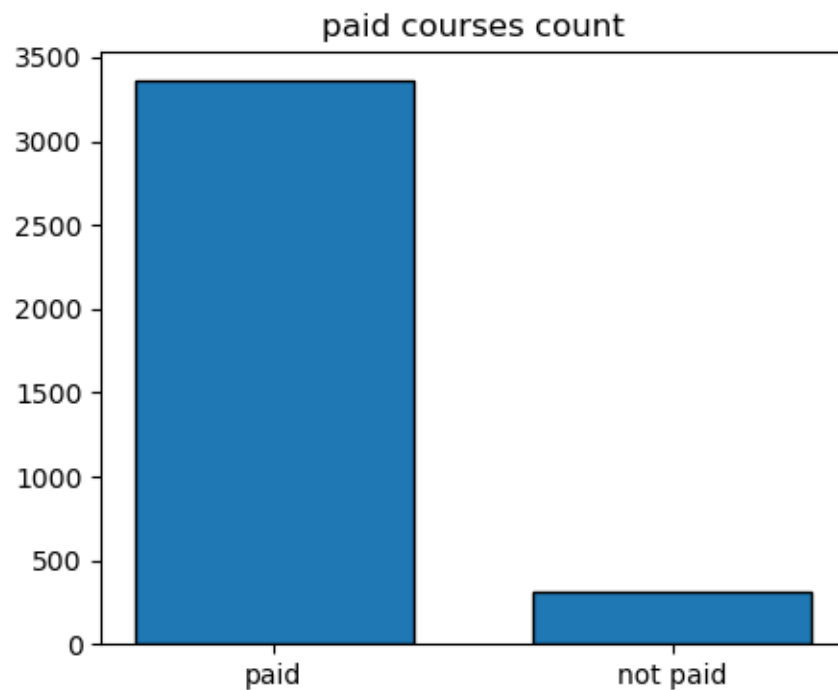

5.0.2 ” most of the courses are paid courses.only few are free ”

```
[43]: sns.countplot(data=df,x='subject',hue='is_paid')
```

```
[43]: <Axes: xlabel='subject', ylabel='count'>
```

28
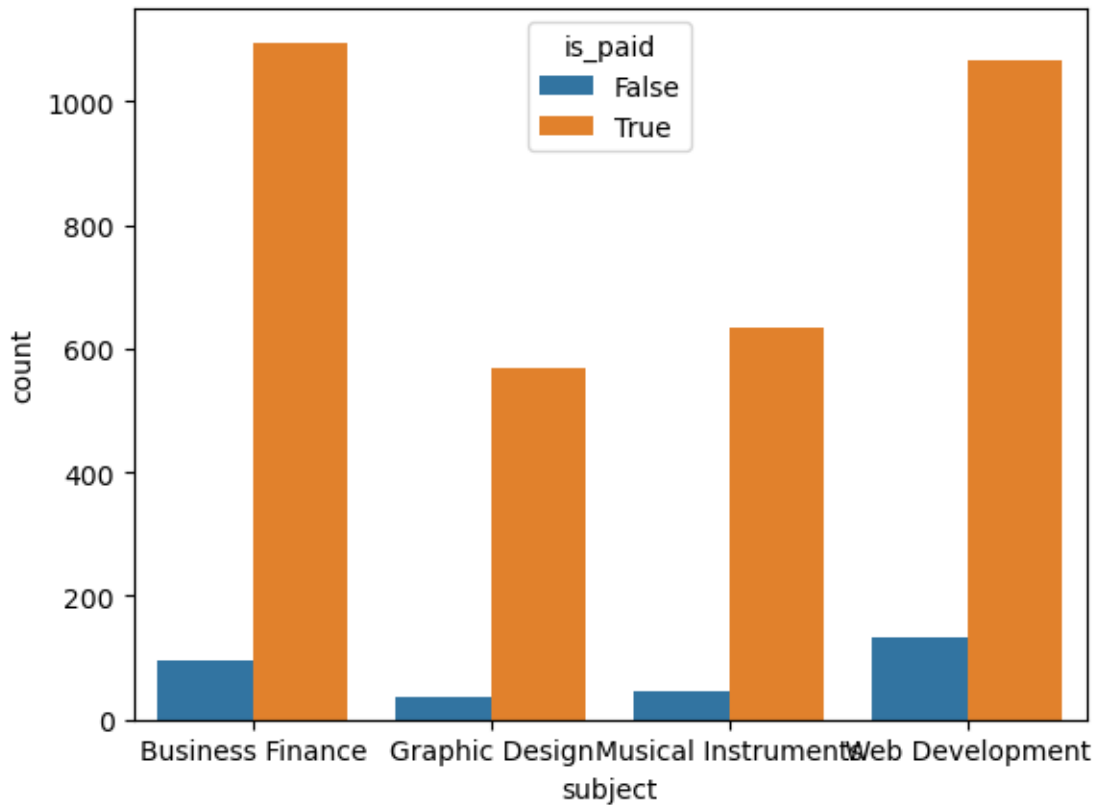
5.0.3 " High concentration of web development and business finance courses "

5.0.4 " Least amount courses are under the Graphic design "

5.0.5 2.Subject Analysis

```
[44]: plt.figure(figsize=(14,7))
      sns.histplot(data=df,x="subject",hue="subject")
      plt.ylabel("num_subscribers")
      plt.title("No. of Subscribers for each Subject")
      plt.show()
```

No. of Subscribers for each Subject
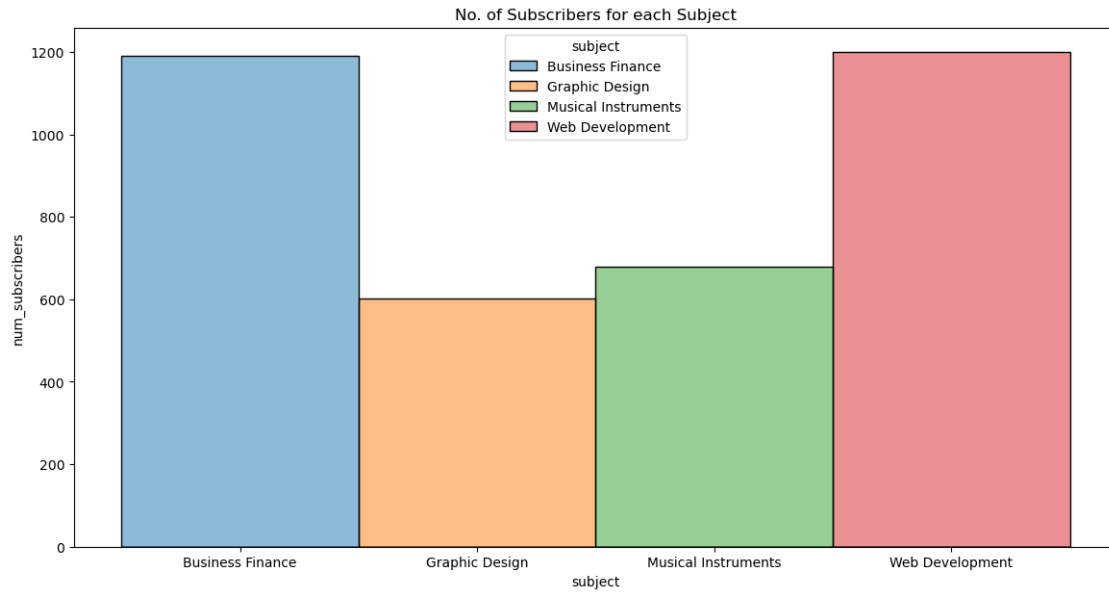
5.0.6 " Business Finance and web Development subjects have more number of subscribers "

5.0.7 " users have a high subject preference towards web Development and Business Finance "

```python
[53]: plt.figure(figsize=(10,10))
      sns.barplot(y="level",x="num_subscribers",data=df,width=0.
       ↪8,orient="h",edgecolor="black")
      plt.title("level vs num_subscribers")
      plt.show()
```

level vs num_subscribers
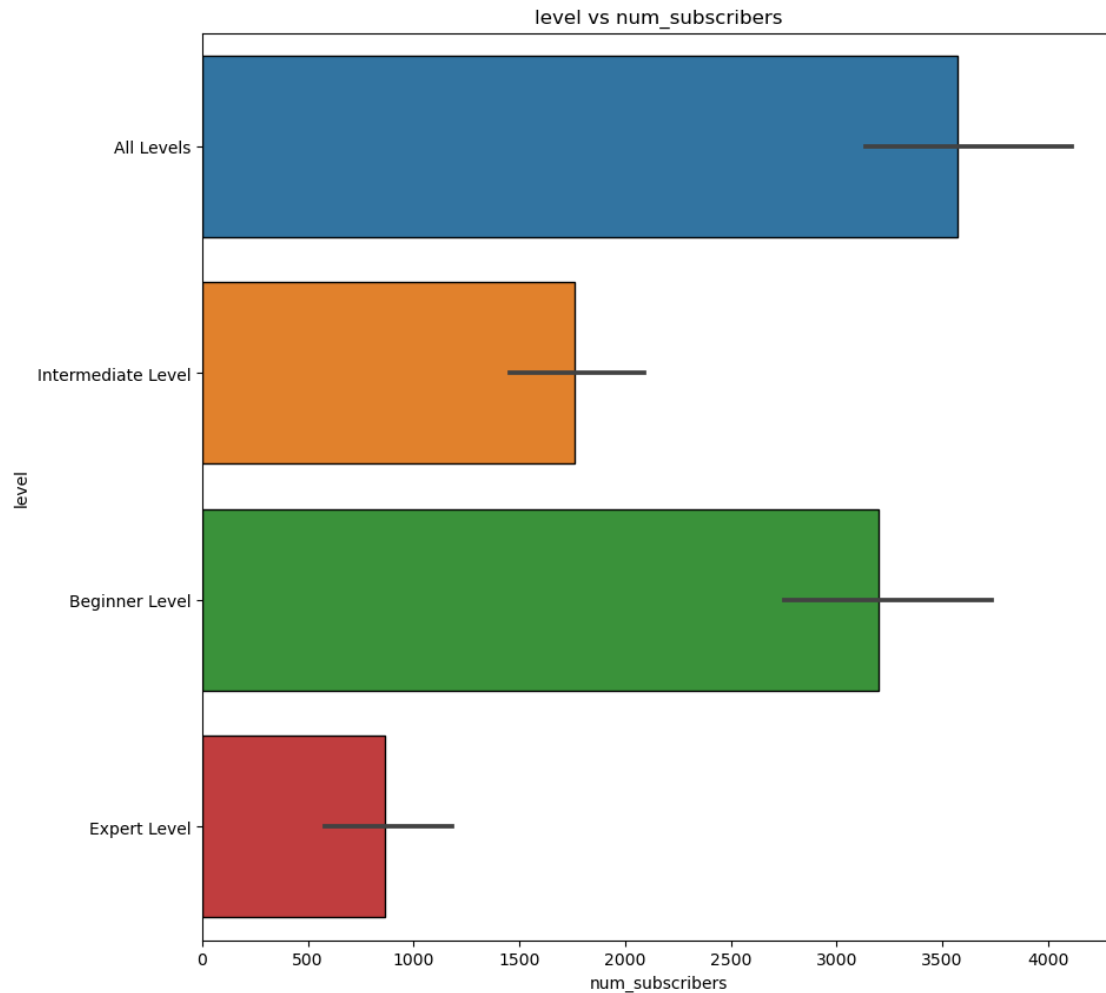
5.0.8 " Low concentration of Expert Level courses compared to the beginner and all level courses "

5.0.9 " users have preference over All level and Beginner category "

5.0.10 3.Correlation Matrix

```
[46]: plt.figure(figsize=(17,6))
      numeric_columns=df.select_dtypes(include="number")
      plt.title("Correlation matrix")
      sns.heatmap(numeric_columns.corr(),annot=True)
```

[46]: <Axes: title={'center': 'Correlation matrix'}>

Correlation matrix
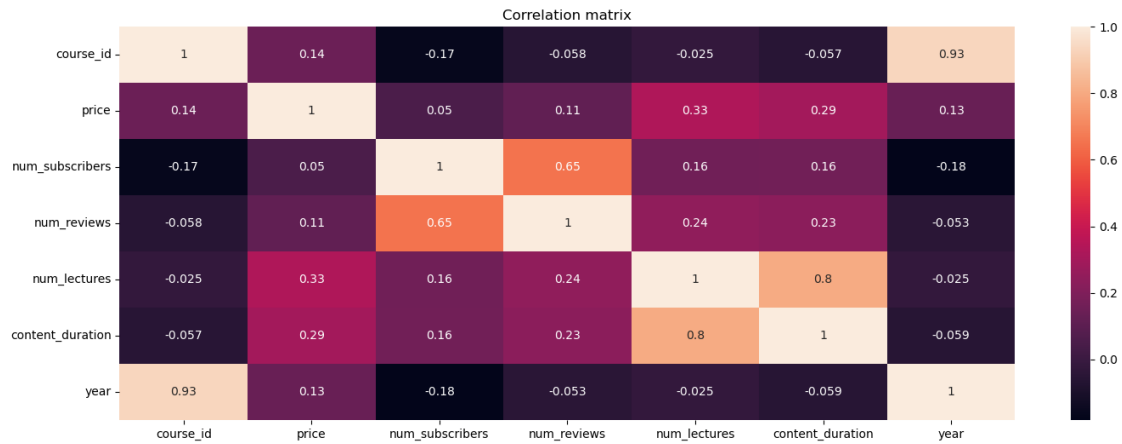
5.0.11 4.Content duration Analysis

```
[47]: plt.figure(figsize=(14,8))
      sns.scatterplot(x="level",y="content_duration",data=df,hue="level")
      plt.title("level vs content_duration")
      plt.show()
```


level vs content_duration
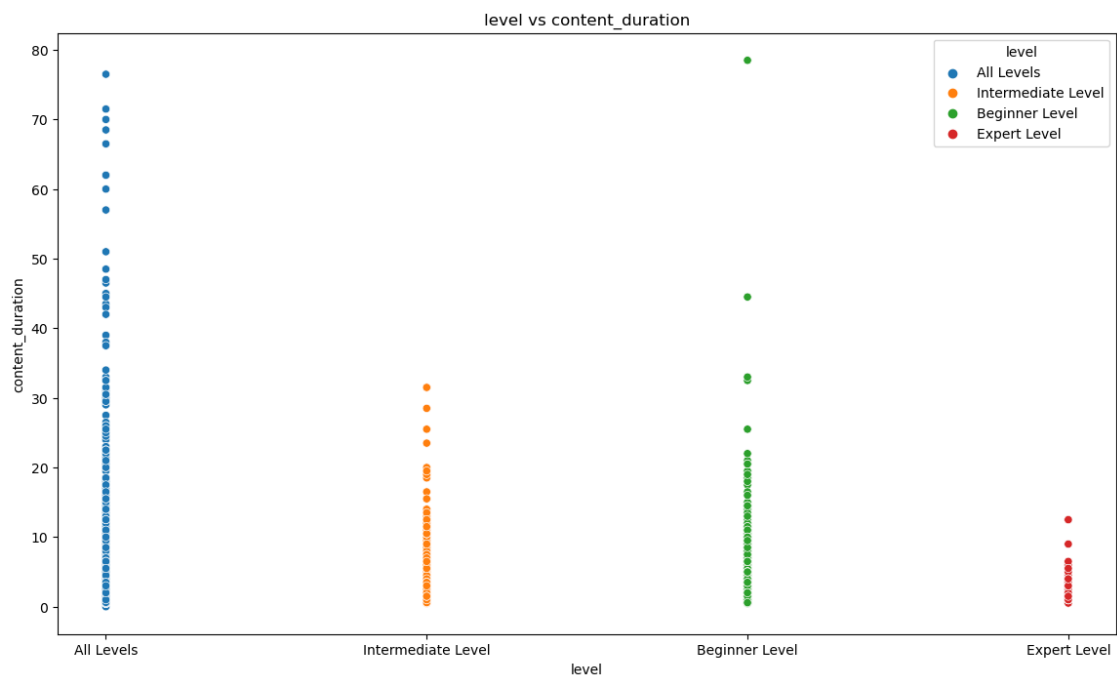
5.0.12 "The content Duration is high for beginner and all level category"

```
[48]: plt.figure(figsize=(14,8))
      sns.scatterplot(x="content_duration",y="num_subscribers",data=df)
      plt.title("content_duration vs subscribers")
      plt.show()
```


content_duration vs subscribers
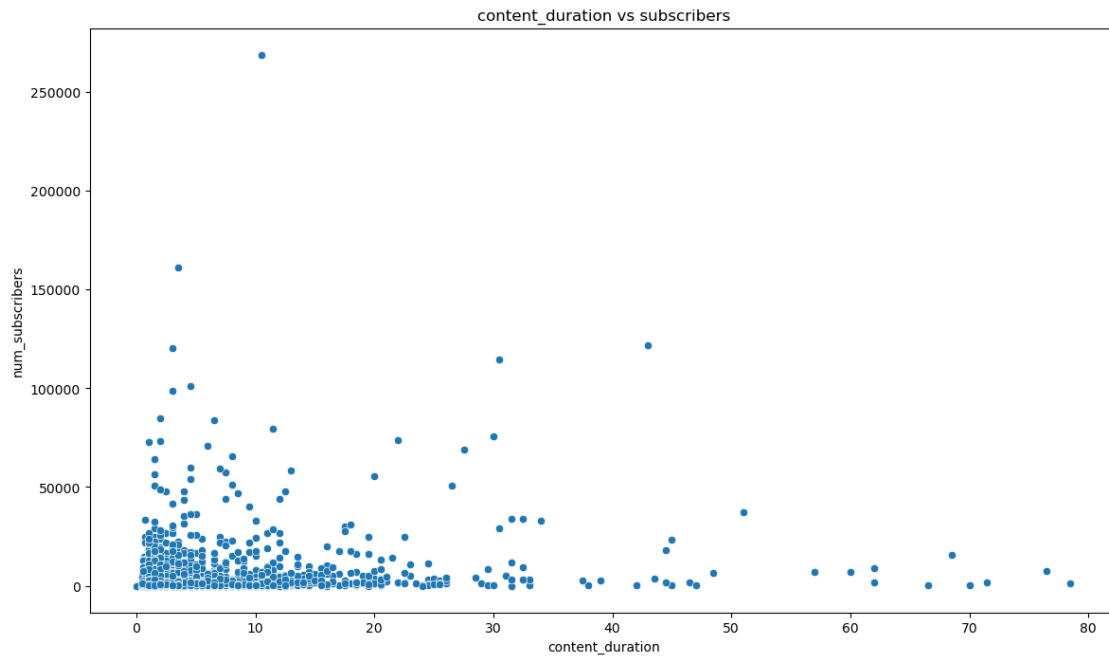
5.0.13 "Most users prefer the courses to have less duration"

```
[49]: plt.figure(figsize=(14,8))
      sns.scatterplot(x="subject",y="num_reviews",data=df,hue="subject")
      plt.title("subject vs reviews")
      plt.show()
```
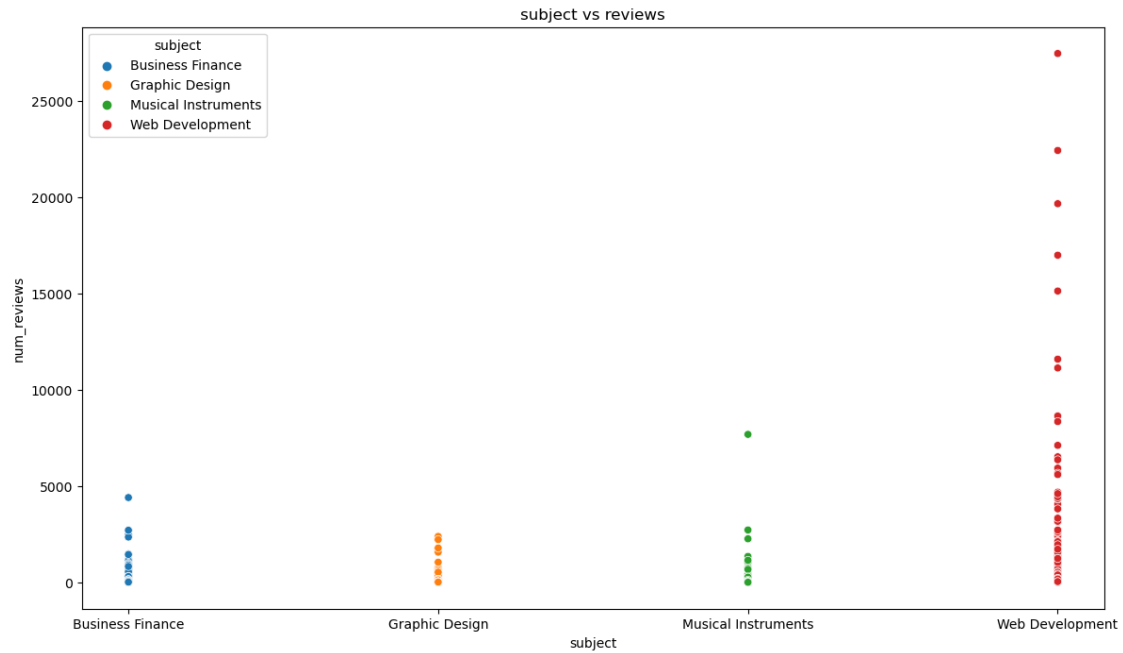
subject vs reviews

5.0.14 " Web Development subject has more number of reviews "

```
[55]: plt.figure(figsize=(15,9))
      sns.boxplot(x="level",y="price",data=df)
      plt.title("Distribution of price with level")
      plt.show()
```

Distribution of price with level
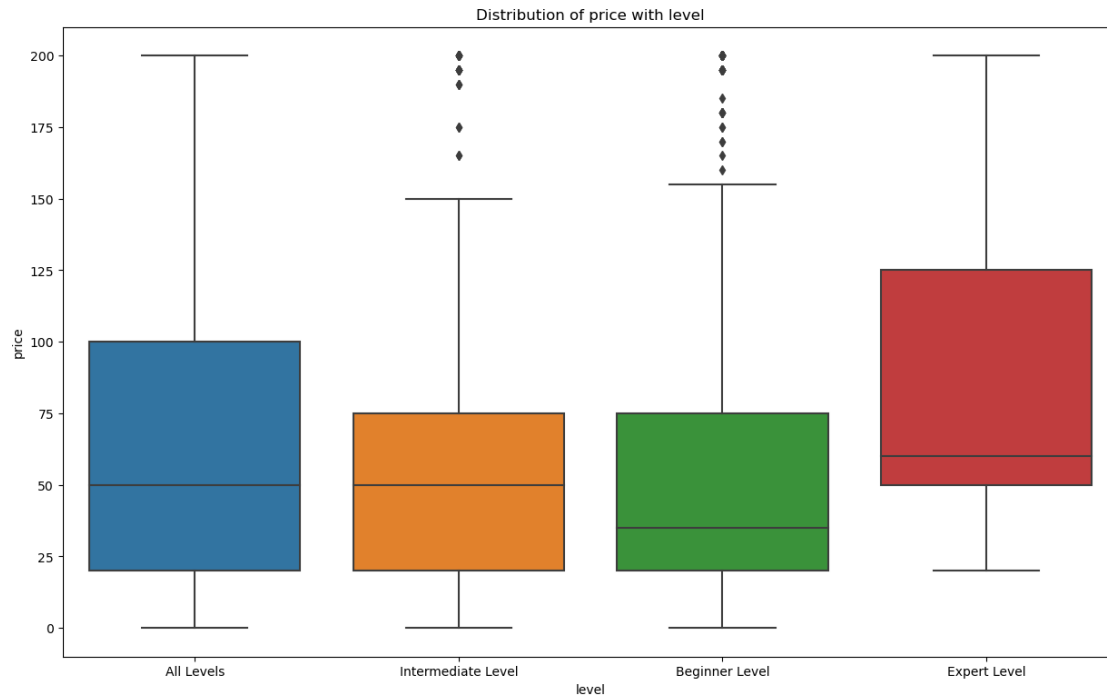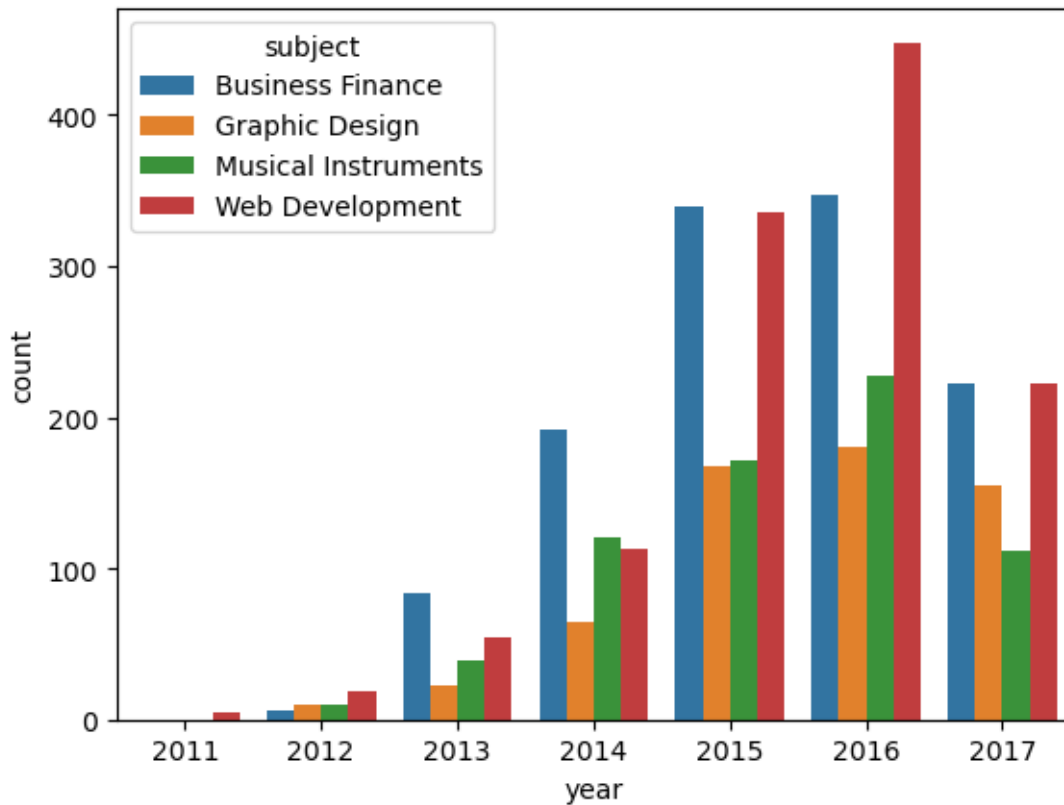
5.0.15 " The price of the courses varied from 0 to 200 "

5.0.16 " Expert level has the most concentration of high paid course "

5.0.17 " Starting price of the beginner level courses are least "

5.0.18 5.Time series Analysis

```
[51]: sns.countplot(data=df,x='year',hue='subject')
```
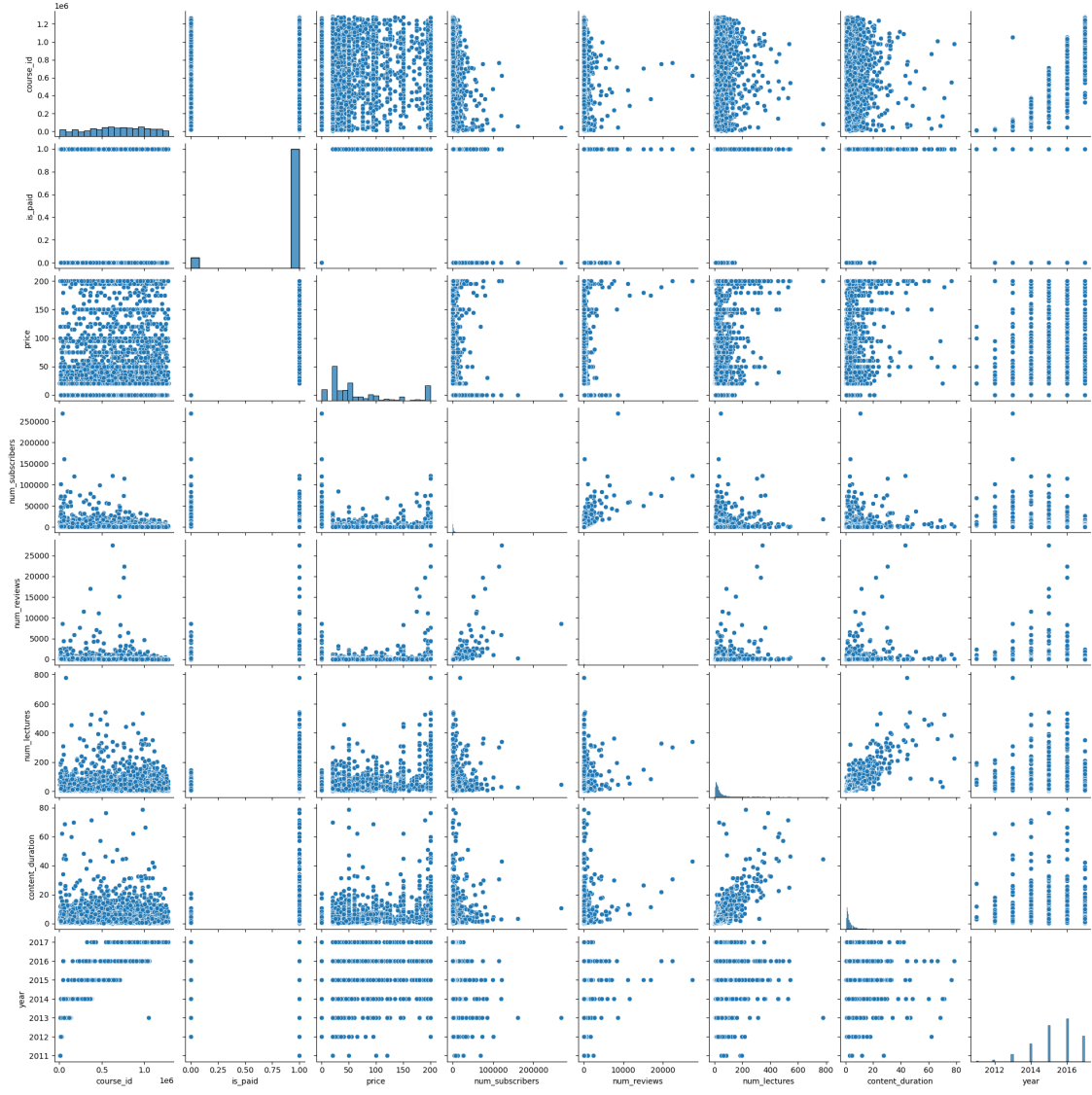
```
[51]: <Axes: xlabel='year', ylabel='count'>
```

5.0.19 " The amount of web Development courses being upload has taken a huge leap in the year 2015 "

5.0.20 " Web Development became the most uploaded course in 2016 "

```
[52]: sns.pairplot(data=df)
```

```
<__array_function__ internals>:180: RuntimeWarning: Converting input from bool
to <class 'numpy.uint8'> for compatibility.
```

```
[52]: <seaborn.axisgrid.PairGrid at 0x24d98859720>
```

6 Conclusion

- most of the courses are paid courses
- users have a high subject preference towards web Development and Business Finance
- Web Development subject has more number of reviews
- users have preferance over All level and Beginner category