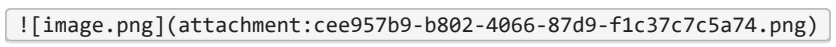
⚡ Powerplay Assessment ⚡

Done by : **KASI**



In [1]:
```
import pandas as pd
```

🔷 Set 1:-

Use data set to answer the following questions using SQL :-

https://raw.githubusercontent.com/rashida048/Datasets/master/movie_dataset.csv

(Read Json data using Python / R Script and create Movie table in database)

In [2]:
```
df = pd.read_csv('movie_dataset.csv')

df['release_date'] = pd.to_datetime(df['release_date'])

ndf = df[['budget','title','production_companies','production_countries','release_date','runtime','vote_average','popularity','re

ndf['runtime'] = ndf['runtime'].fillna(ndf['runtime'].mode()[0])
ndf['release_date'] = ndf['release_date'].fillna(ndf['release_date'].mode()[0])

display(ndf.isna().sum())
```

```
C:\Users\KASI Profession\AppData\Local\Temp\ipykernel_22140\959624700.py:7: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-ver
sus-a-copy
  ndf['runtime'] = ndf['runtime'].fillna(ndf['runtime'].mode()[0])
C:\Users\KASI Profession\AppData\Local\Temp\ipykernel_22140\959624700.py:8: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-ver
sus-a-copy
  ndf['release_date'] = ndf['release_date'].fillna(ndf['release_date'].mode()[0])
budget                  0
title                   0
production_companies    0
production_countries    0
release_date            0
runtime                 0
vote_average            0
popularity              0
revenue                 0
dtype: int64
```

In [3]:
```
movie_data = ndf.copy()

# Converting the 'production_companies' and 'production_countries' columns from JSON string to python list
# json.loads didnt work
movie_data['production_companies'] = movie_data['production_companies'].apply(eval)
movie_data['production_countries'] = movie_data['production_countries'].apply(eval)

movie_data
```

Out[3]:

	budget	title	production_companies	production_countries	release_date	runtime	vote_average	popularity	revenue
0	237000000	Avatar	[{'name': 'Ingenious Film Partners', 'id': 289...	[{'iso_3166_1': 'US', 'name': 'United States o...	2009-12-10	162.0	7.2	150.437577	2787965087
1	300000000	Pirates of the Caribbean: At World's End	[{'name': 'Walt Disney Pictures', 'id': 2}, {'...	[{'iso_3166_1': 'US', 'name': 'United States o...	2007-05-19	169.0	6.9	139.082615	961000000
2	245000000	Spectre	[{'name': 'Columbia Pictures', 'id': 5}, {'nam...	[{'iso_3166_1': 'GB', 'name': 'United Kingdom'...	2015-10-26	148.0	6.3	107.376788	880674609
3	250000000	The Dark Knight Rises	[{'name': 'Legendary Pictures', 'id': 923}, {'...	[{'iso_3166_1': 'US', 'name': 'United States o...	2012-07-16	165.0	7.6	112.312950	1084939099
4	260000000	John Carter	[{'name': 'Walt Disney Pictures', 'id': 2}]	[{'iso_3166_1': 'US', 'name': 'United States o...	2012-03-07	132.0	6.1	43.926995	284139100
...	...	...	...	...	...	...	...	...	...
4798	220000	El Mariachi	[{'name': 'Columbia Pictures', 'id': 5}]	[{'iso_3166_1': 'MX', 'name': 'Mexico'}, {'iso...	1992-09-04	81.0	6.6	14.269792	2040920
4799	9000	Newlyweds	[]	[]	2011-12-26	85.0	5.9	0.642552	0
4800	0	Signed, Sealed, Delivered	[{'name': 'Front Street Pictures', 'id': 3958}...	[{'iso_3166_1': 'US', 'name': 'United States o...	2013-10-13	120.0	7.0	1.444476	0
4801	0	Shanghai Calling	[]	[{'iso_3166_1': 'US', 'name': 'United States o...	2012-05-03	98.0	5.7	0.857008	0
4802	0	My Date with Drew	[{'name': 'rusty bear entertainment', 'id': 87...	[{'iso_3166_1': 'US', 'name': 'United States o...	2005-08-05	90.0	6.3	1.929883	0

4803 rows × 9 columns

In [4]:
```
movie_data['production_companies'] = movie_data['production_companies'].apply(lambda x: [company['name'] for company in x])
movie_data['production_countries'] = movie_data['production_countries'].apply(lambda x: [country['name'] for country in x])

movie_data.head()
```

Out[4]:

	budget	title	production_companies	production_countries	release_date	runtime	vote_average	popularity	revenue
0	237000000	Avatar	[Ingenious Film Partners, Twentieth Century Fo...	[United States of America, United Kingdom]	2009-12-10	162.0	7.2	150.437577	2787965087
1	300000000	Pirates of the Caribbean: At World's End	[Walt Disney Pictures, Jerry Bruckheimer Films...	[United States of America]	2007-05-19	169.0	6.9	139.082615	961000000
2	245000000	Spectre	[Columbia Pictures, Danjaq, B24]	[United Kingdom, United States of America]	2015-10-26	148.0	6.3	107.376788	880674609
3	250000000	The Dark Knight Rises	[Legendary Pictures, Warner Bros., DC Entertai...	[United States of America]	2012-07-16	165.0	7.6	112.312950	1084939099
4	260000000	John Carter	[Walt Disney Pictures]	[United States of America]	2012-03-07	132.0	6.1	43.926995	284139100

In [5]:
```
df = movie_data.copy()
```

In [6]:
```
unnesting = ['production_companies','production_countries']
for column in unnesting:
    df = df.explode(column)
```

In [7]:
```
df
```

Out[7]:

	budget	title	production_companies	production_countries	release_date	runtime	vote_average	popularity	revenue
0	237000000	Avatar	Ingenious Film Partners	United States of America	2009-12-10	162.0	7.2	150.437577	2787965087
0	237000000	Avatar	Ingenious Film Partners	United Kingdom	2009-12-10	162.0	7.2	150.437577	2787965087
0	237000000	Avatar	Twentieth Century Fox Film Corporation	United States of America	2009-12-10	162.0	7.2	150.437577	2787965087
0	237000000	Avatar	Twentieth Century Fox Film Corporation	United Kingdom	2009-12-10	162.0	7.2	150.437577	2787965087
0	237000000	Avatar	Dune Entertainment	United States of America	2009-12-10	162.0	7.2	150.437577	2787965087
...	...	...	...	...	...	...	...	...	...
4800	0	Signed, Sealed, Delivered	Muse Entertainment Enterprises	United States of America	2013-10-13	120.0	7.0	1.444476	0
4801	0	Shanghai Calling	NaN	United States of America	2012-05-03	98.0	5.7	0.857008	0
4801	0	Shanghai Calling	NaN	China	2012-05-03	98.0	5.7	0.857008	0
4802	0	My Date with Drew	rusty bear entertainment	United States of America	2005-08-05	90.0	6.3	1.929883	0
4802	0	My Date with Drew	lucky crow films	United States of America	2005-08-05	90.0	6.3	1.929883	0

22780 rows × 9 columns

In [8]:
```
df.isna().sum()
```

Out[8]:
```
budget                  0
title                   0
production_companies    394
production_countries    184
release_date            0
runtime                 0
vote_average            0
popularity              0
revenue                 0
dtype: int64
```

In [9]:
```
df['production_companies'] = df['production_companies'].fillna('unknown')
df['production_countries'] = df['production_countries'].fillna('unknown')
```

In [10]:
```
df.isna().sum()
```

Out[10]:
```
budget                  0
title                   0
production_companies    0
production_countries    0
release_date            0
runtime                 0
vote_average            0
popularity              0
revenue                 0
dtype: int64
```

In [11]:
```
df.to_csv('powerplay_movie_cleaned.csv',index=False)
```

In [12]:
```
df.shape
```

Out[12]:
```
(22780, 9)
```

📂 Loaded to Bigquery

⚡ 1. Which is the movie(s) with the smallest runtime?

```sql
SELECT DISTINCT
    title AS smallest_movie,
    runtime AS duration_in_mins
FROM
    `powerplay.powerplay_movie_cleaned`
WHERE
    runtime = (
        SELECT MIN(runtime)
        FROM `powerplay.powerplay_movie_cleaned`
    )
GROUP BY
    1, 2;
```

```sql
SELECT DISTINCT
    title AS smallest_movie,
    runtime AS duration_in_mins
FROM
    `powerplay.powerplay_movie_cleaned`
WHERE
    runtime = (
        SELECT MIN(runtime)
        FROM `powerplay.powerplay_movie_cleaned`
    )
GROUP BY
    1, 2;
```

Press Al

Query results

SAVE RESULTS EX

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAILS | EXECUTION GRAPH

Row	smallest_movie	duration_in_mins
1	Should've Been Romeo	0.0
2	Sharkskin	0.0
3	Hum To Mohabbat Karega	0.0
4	Dil Jo Bhi Kahey...	0.0
5	Harrison Montgomery	0.0
6	Light from the Darkroom	0.0
7	America Is Still the Place	0.0

Results per page: 50 1 – 35 of 35

Which is the movie(s) with the highest runtime?

```sql
SELECT DISTINCT
    title AS Lengthiest_movie,
    runtime AS duration_in_mins
FROM
    `powerplay.powerplay_movie_cleaned`
WHERE
    runtime = (
        SELECT MAX(runtime)
        FROM `powerplay.powerplay_movie_cleaned`
    )
GROUP BY
    1, 2;
```

powerplay-set1 RUN SAVE QUERY SHARE SCHEDULE MORE

```sql
SELECT DISTINCT
    title AS Lengthiest_movie,
    runtime AS duration_in_mins
FROM
    `powerplay.powerplay_movie_cleaned`
WHERE
    runtime = (
        SELECT MAX(runtime)
        FROM `powerplay.powerplay_movie_cleaned`
    )
GROUP BY
    1, 2;
```

Query results

SAVE RESULTS

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAILS | EXECUTION GRAPH

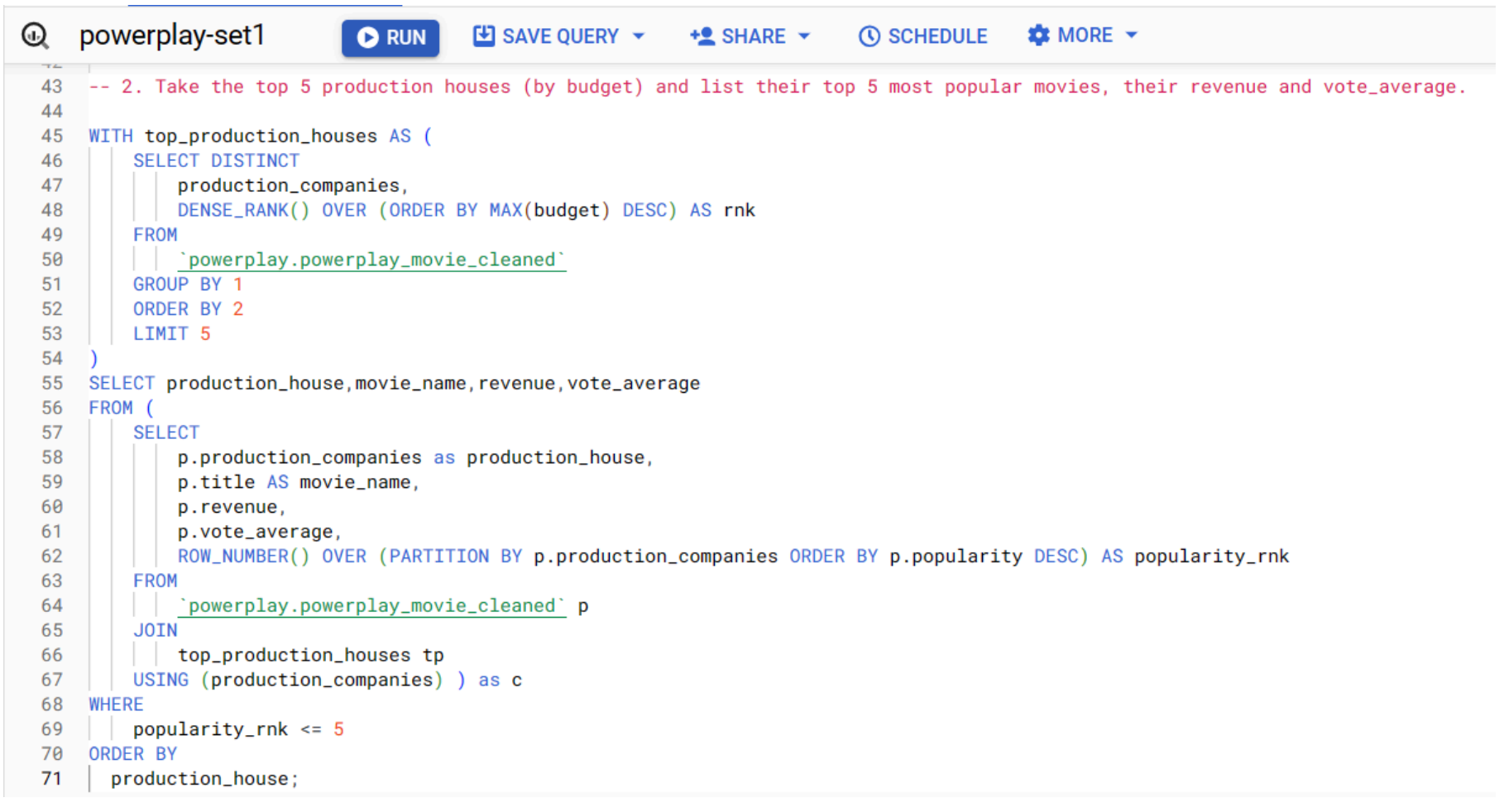
Row	Lengthiest_movie	duration_in_mins
1	Carlos	338.0

🔹 Insight:

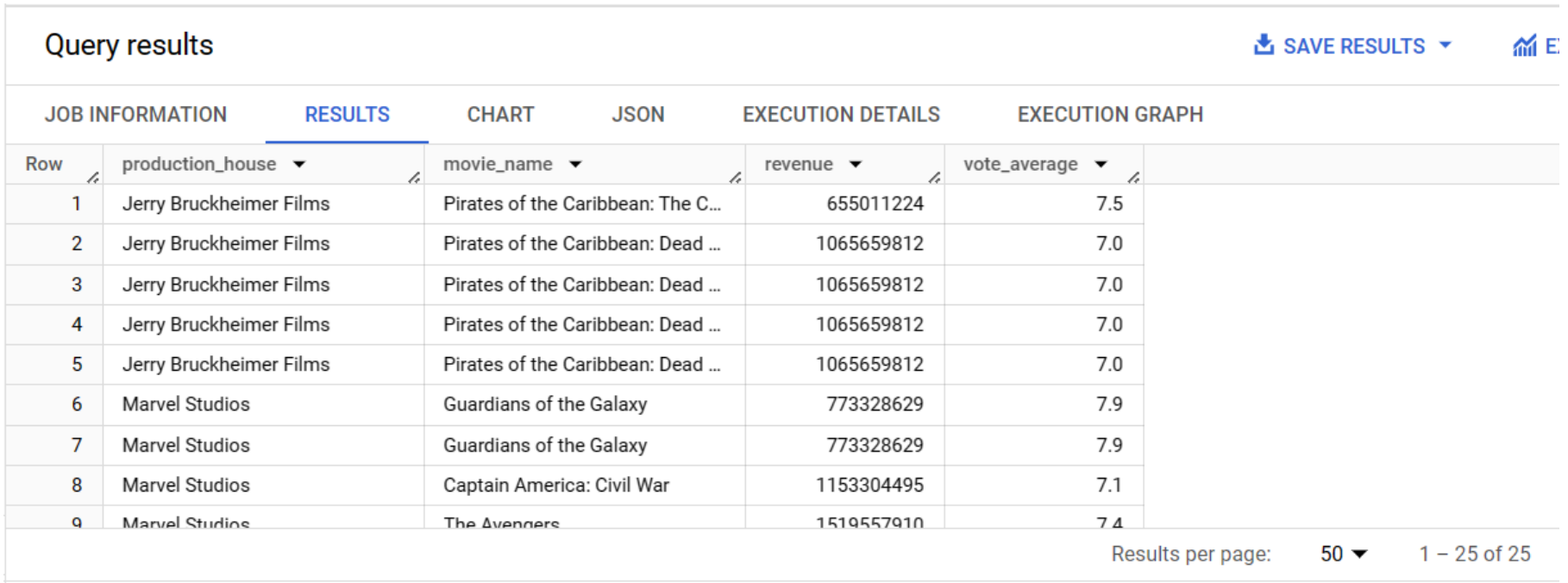
- There are 35 movies with duration as 0.0 mins of runtime.
- `Carlos` movie is lengthiest movie with duration of 338 minutes.

2.Take the top 5 production houses (by budget) and list their top 5 most popular movies, their revenue and vote_average.

```sql
WITH top_production_houses AS (
    SELECT DISTINCT
        production_companies,
        DENSE_RANK() OVER (ORDER BY MAX(budget) DESC) AS rnk
    FROM
        `powerplay.powerplay_movie_cleaned`
    GROUP BY 1
    ORDER BY 2
    LIMIT 5
)
SELECT production_house,movie_name,revenue,vote_average
FROM (
    SELECT
        p.production_companies as production_house,
        p.title AS movie_name,
        p.revenue,
        p.vote_average,
        ROW_NUMBER() OVER (PARTITION BY p.production_companies ORDER BY p.popularity DESC) AS popularity_rnk
    FROM
        `powerplay.powerplay_movie_cleaned` p
    JOIN
        top_production_houses tp
    USING (production_companies) ) as c
WHERE
    popularity_rnk <= 5
ORDER BY
production_house;
```



Output:



🔹 Insights:

Top Production houses by budget:

- Walt Disney Pictures

- Moving Picture Company (MPC)
- Jerry Bruckheimer Films
- Second Mate Productions
- Marvel Studios

and each production houses top 5 productions are listed.

⚡ 3. List the production house for every year from 2000-2016 which has released the most number of movies in that year.

```sql
WITH yearlymoviecounts AS (
    SELECT
        EXTRACT(YEAR FROM release_date) AS release_year,
        production_companies,
        COUNT(DISTINCT title) AS num_of_movies
    FROM
        `powerplay.powerplay_movie_cleaned`
    WHERE
        EXTRACT(YEAR FROM release_date) BETWEEN 2000 AND 2016
        AND production_companies != 'unknown'
    GROUP BY
        release_year, production_companies
    ORDER BY
        release_year, num_of_movies DESC
),topproductioncompanies AS (
    SELECT
        *,
        ROW_NUMBER() OVER (PARTITION BY release_year ORDER BY num_of_movies DESC) AS rn
    FROM
        yearlymoviecounts
)
SELECT
    release_year,production_companies,num_of_movies
FROM
    topproductioncompanies
WHERE
    rn = 1
ORDER BY
    release_year;
```

Output:

Query results

SAVE RESULTS | EXPLORE DATA

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAILS | EXECUTION GRAPH

Row	release_year	production_companies	num_of_movies
1	2000	Warner Bros.	14
2	2001	Warner Bros.	15
3	2002	Paramount Pictures	15
4	2003	Universal Pictures	14
5	2004	Warner Bros.	14
6	2005	Universal Pictures	15
7	2006	Warner Bros.	17
8	2007	Warner Bros.	14
9	2008	Relativity Media	20
10	2009	Relativity Media	19
11	2010	Relativity Media	18
12	2011	Columbia Pictures	14

Results per page: 50 1 – 17 of 17

🔹 Insights:

- For all the 17 years from 2000 to 2016 , every years Highest no.of movies producing Productions are listed with no.of productions.
- Most of years `Warner Bros` has made many movies followed by `Relative Media` production House.

⚡ 4. You are going to invest all your life's savings in a production company. You have two choices: "Marvel Studios" and "DC Comics". Which company would you bet on? This is an open ended question. Define your own metrics to measure which one is a better investment opportunity and defend your analysis.

- If I had to pick between *Marvel Studios* and *DC Comics* for my investments, I'd go with `Marvel` .

Here's why:

> I'm a fan of Comics and I love both Marvel and DC Theoretically but Cinematically I would prefer `Marvel` because of the cinematic experience, VFX, post credit scenes and writer of Marvel comics `STAN LEE` 's cameo presence makes it enjoyable than DC.
>
> Marvel movies are fun and family-friendly, reaching a big audience, even families. DC tends to be darker, so it might not appeal to as many people. Marvel keeps trying new flavors and changes based on what people like. DC can be slower to do that.
>
> Marvel is also good at exploring new things. They introduce new characters and listen to what fans like. DC, while sticking with its famous heroes, doesn't change as quickly.
>
> Marvel makes a superhero world where all the characters are connected. This makes fans stick around and keeps them excited for what's next. DC, on the other hand, usually keeps its superheroes separate, which means a bad movie doesn't affect the others, but a good one doesn't boost them much either.
>
> Marvel operates like a seamless universe, not just a collection of franchises. This interconnected approach cultivates fan loyalty and sustains repeat viewership. In contrast, DC tends to treat its superheroes as standalone franchises, minimizing the impact of a failure but also diluting the momentum of a success.
>
> Think of superhero movies like a candy vending machine. Marvel is like a big, well-run machine giving you a variety of flavors that all connect. If one flavor isn't great, you're still excited about the next one. DC is like several machines with just one flavor each. If one flavor doesn't work, that machine stops, and even if one is great, it doesn't really help the others.
>
> In short, Marvel knows how to keep things exciting and adapt to what people want & thereby yielding a profit and based on the BoxOffice collections for sure we can say Marvel studios Kevin Feigi & his team is Pro in it.

conclusion:

- ***So, if I want my life savings to be safe and successful, I'd go with `Marvel` and invest in `Marvel Studios` to keep my principle safe and high yield of shares and profit.***

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Set 2

Set 2:- Solve Below Question Using SQL :-

Table 1:- User Profile Data

User Id	Install Date	Role	Org ID
1	2022-05-01 12:30:45	Site Engineer	O1
1	2023-04-01 00:30:46	Planning Manager	O2
1	2023-07-01 05:45	Owner	OAE1
2	2021-04-03 14:23	SIte Engineer	OO1
2	2022-12-12 03:25	Site Supervisor	OO2
3	2023-01-01 16:45	Project Manager	AA1
3	2023-03-03 10:10	Project Manager	AA2
3	2023-03-03 11:11	CXO	AA3

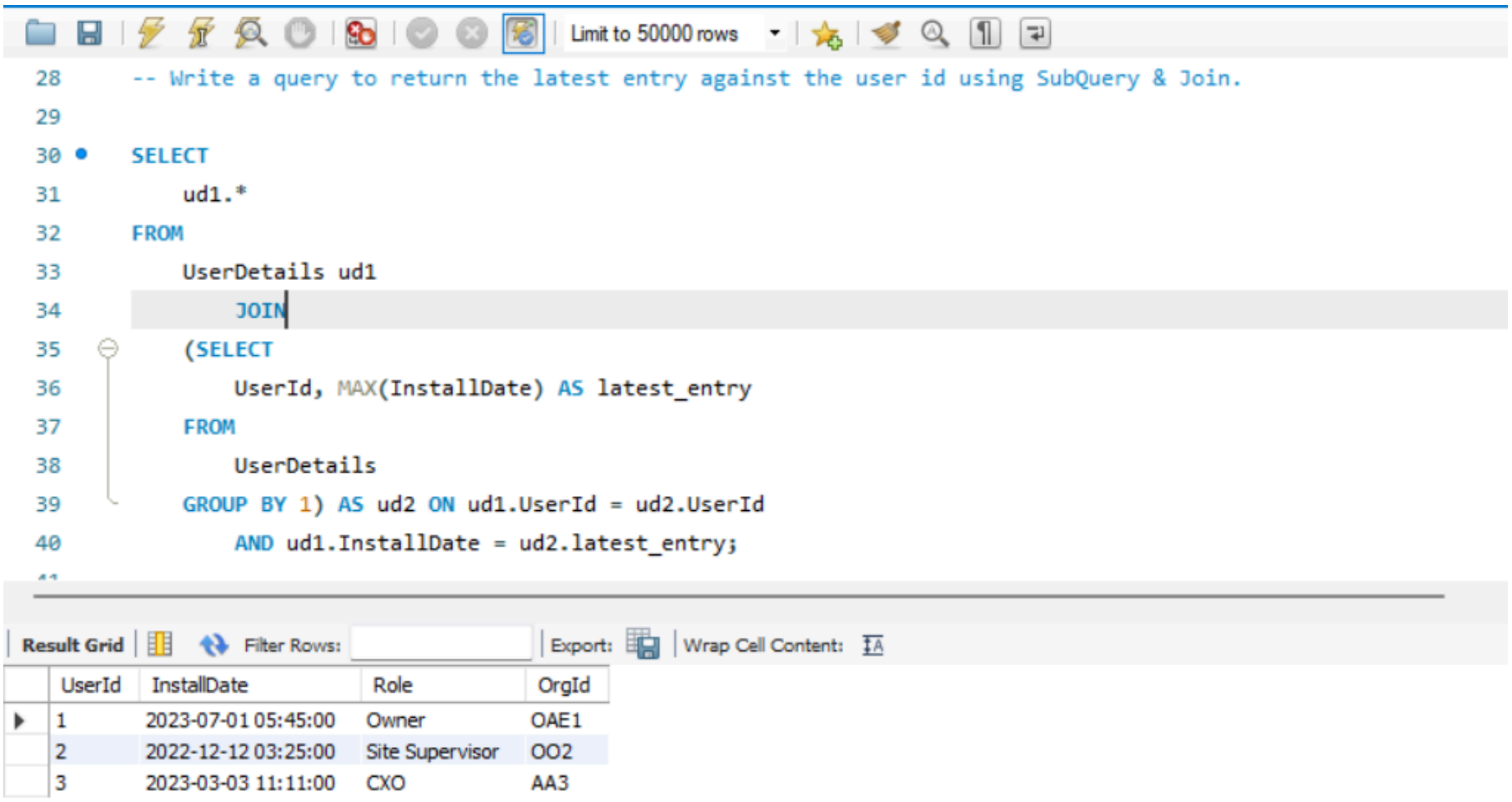
1. **Write a query to return the latest entry against the user id using SubQuery & Join.**

2. **Write a query to return the latest entry against the user id using the window function.**

1. Write a query to return the latest entry against the user id using SubQuery & Join.

```
SELECT
    ud1.*
FROM
    UserDetails ud1
        JOIN
    (SELECT
        UserId, MAX(InstallDate) AS latest_entry
    FROM
        UserDetails
    GROUP BY 1) AS ud2 ON ud1.UserId = ud2.UserId
        AND ud1.InstallDate = ud2.latest_entry;
```

Output:



2. Write a query to return the latest entry against the user id using the window function.

```
WITH cte AS(
SELECT *,
    LAST_VALUE(InstallDate) OVER(PARTITION BY UserId) AS latest_entry
```

```sql
FROM
    UserDetails
)
SELECT
    UserId, InstallDate, Role, OrgId
FROM
    cte
WHERE
    InstallDate = latest_entry;

-- or  (rank or row_number)

WITH cte AS(
SELECT * ,
    RANK() OVER(PARTITION BY UserId ORDER BY InstallDate DESC) AS rnk
FROM
    UserDetails
)
SELECT
    UserId, InstallDate, Role, OrgId
FROM
    cte
WHERE
    rnk = 1;
```

```sql
WITH cte AS(
SELECT * ,
    RANK() OVER(PARTITION BY UserId ORDER BY InstallDate DESC) AS rnk
FROM
    UserDetails
)
SELECT
    UserId, InstallDate, Role, OrgId
FROM
    cte
WHERE
    rnk = 1;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

UserId	InstallDate	Role	OrgId
1	2023-07-01 05:45:00	Owner	OAE1
2	2022-12-12 03:25:00	Site Supervisor	OO2
3	2023-03-03 11:11:00	CXO	AA3

1.Write a query to find the number of products bought in the month of January 2021.

2. Write a query to return the latest entry against the user id using the window function.

Table 2 ORDER_TABLE :-

user_id	order_id	purchase_datetime	product	category	product_revenue
56KHB	1234	2021-01-20 13:33:44	biscuit	food	100
56KHB	1234	2021-01-20 13:33:44	crocin	medicine	50
32HBK	1235	2021-08-20 13:38:55	chips	food	100
67ABC	1236	2021-08-20 15:32:12	shoes	footwear	1200
67ABC	1236	2021-08-20 15:32:12	shirt	clothing	500
67ABC	1236	2021-01-20 15:32:12	earphones	electronics	450
67ABC	1237	2021-08-20 16:18:19	laptop	electronics	45000
67ABC	1237	2021-08-20 16:18:19	socks	clothing	150

1. Write a query to find the number of products bought in the month of January 2021.
2. Write a query to find the second order_id for each user_id (Without Window Function)
3. Write a query to find the min, max and average time between two orders for any user.

```sql
SELECT
    COUNT(DISTINCT product) AS no_of_products
FROM
    OrderDetails
WHERE
```

```sql
    MONTH(purchase_datetime) = 01
        AND YEAR(purchase_datetime) = 2021;
```

```sql
-- 1.Write a query to find the number of products bought in the month of January 2021.

SELECT
    COUNT(DISTINCT product) AS no_of_products
FROM
    OrderDetails
WHERE
    MONTH(purchase_datetime) = 01
        AND YEAR(purchase_datetime) = 2021;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

no_of_products
3

⚡ 2.Write a query to find the second order_id for each user_id (Without Window Function)

```sql
SELECT
    o1.user_id, o2.order_id AS Second_order_id
FROM
    OrderDetails o1
        JOIN
    OrderDetails o2 USING (user_id)
WHERE
    o1.order_id < o2.order_id
GROUP BY 1 , 2;
```

```sql
-- 2.Write a query to find the second order_id for each user_id ( Without Window Function)

SELECT
    o1.user_id, o2.order_id AS Second_order_id
FROM
    OrderDetails o1
        JOIN
    OrderDetails o2 USING (user_id)
WHERE
    o1.order_id < o2.order_id
GROUP BY 1 , 2;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

user_id	Second_order_id
67ABC	1237

⚡ 3.Write a query to find the min, max and average time between two orders for any user.

```sql
SELECT
    user_id,
    MIN(between_time) AS min_time,
    MAX(between_time) AS max_time,
    AVG(between_time) AS avg_time
FROM
    (SELECT
        user_id,
            DATEDIFF(MAX(purchase_datetime), MIN(purchase_datetime)) AS between_time
    FROM
        OrderDetails
    GROUP BY 1
    HAVING COUNT(DISTINCT order_id) > 1) AS c
GROUP BY 1;
```

```sql
-- 3.Write a query to find the min, max and average time between two orders for any user.
SELECT
    user_id,
    MIN(between_time) AS min_time,
    MAX(between_time) AS max_time,
    AVG(between_time) AS avg_time
FROM
    (SELECT
        user_id,
            DATEDIFF(MAX(purchase_datetime), MIN(purchase_datetime)) AS between_time
    FROM
        OrderDetails
    GROUP BY 1
    HAVING COUNT(DISTINCT order_id) > 1) AS c
GROUP BY 1;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

user_id	min_time	max_time	avg_time
67ABC	212	212	212.0000

In [ ]:

Set 3:

Set 3 :-
Json Data (Meta Data) :-

```
mobile:{
  “Name”: “xyz”,
  “Mobile” :”Iphone”
  “Mobileid”:23,
   “Mapping”: {
            “Imei”:12344567777,
            “Specification”: {
             Model :- “Apple 12”,
             OS Version:-17.0.1,
          },
            “Country”:”us”,
           “Product_name”:”iphone 12”
  }
}
```

Write a python script to extract following information (without using any inbuilt Function) use only pandas (list, dictionary etc), and Loop (for, while etc)

Output :- Imei, model,os version,country,product_name,mobileid

In [14]:
```python
mobile = {
    "Name": "xyz",
    "Mobile": "Iphone",
    "Mobileid": 23,
    "Mapping": {
        "Imei": 12344567777,
        "Specification": {
            "Model": "Apple 12",
            "Os Version": "17.0.1",
        },
        "Country": "us",
        "Product_name": "iphone 12"
    }
}
print(mobile)
```

```
{'Name': 'xyz', 'Mobile': 'Iphone', 'Mobileid': 23, 'Mapping': {'Imei': 12344567777, 'Specification': {'Model': 'Apple 12', 'Os Version': '17.0.1'}, 'Country': 'us', 'Product_name': 'iphone 12'}}
```

In [15]:
```python
result = {
          'Imei':None,
          'Model':None,
          'Os Version':None,
          'Country':None,
          'Product_name':None,
          'Mobileid':None
         }

result['Imei'] = mobile['Mapping']['Imei']
```

```
result['Model'] = mobile['Mapping']['Specification']['Model']

result['Os Version'] = mobile['Mapping']['Specification']['Os Version']

result['Country'] = mobile['Mapping']['Country']

result['Product_name'] = mobile['Mapping']['Product_name']

result['Mobileid'] = mobile['Mobileid']

for key,value in result.items():
    print(f"{key} - {value}")
```

```
Imei - 12344567777
Model - Apple 12
Os Version - 17.0.1
Country - us
Product_name - iphone 12
Mobileid - 23
```

In [ ]:

🔷 Set 4:

Set 4:-

The attachments are two datasets, one contains organization, project, and user-level event data and another one has the respective event description and their sections on the app. Here, Event means any click or page load, or scroll happening on the app.

Q. The goal is to identify patterns & insights from the dataset. Also, look out for insights/triggers that activated the users and subsequently engaged them.

We understand this is very open-ended, and that's the point. Be creative.

In [16]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [17]:
```
df1 = pd.read_csv("User - Event Raw Dataset (2).csv" , parse_dates=[0])
df2 = pd.read_csv("Event Description Mapping (2).csv")
display(df1,df2)
```

	created_at_time	event	org_id	project_id	user_id
0	2022-04-20 18:24:30	project_creation_request_success	ORG-2nufoaj370k	PRJ4k2kct6c5854	USRl50abktx6cc1
1	2022-04-25 23:29:54	task_log_create_success	ORG-7fcq2k7b4xg	PRJ0ypqfy9v4kii	USRqki2dkqwj6xj
2	2022-04-25 23:29:54	task_creation	ORG-7fcq2k7b4xg	PRJ0ypqfy9v4kii	USRqki2dkqwj6xj
3	2022-04-25 23:28:23	project_creation_request_success	ORG-7fcq2k7b4xg	PRJfk9dy2gb6dhp	USRqki2dkqwj6xj
4	2022-03-22 20:40:20	task_log_create_success	ORG-iluuim4club	PRJ1jrd11tr99dc	USRcsxgn7-vnztk
...	...	...	...	...	...
41172	2022-04-07 08:12:59	assigned_people_on_task	ORG588585401431	PRJ971575485352	USR811917964372
41173	2022-04-07 10:30:06	assigned_people_on_task	ORG588585401431	PRJ497168717769	USR811917964372
41174	2022-04-12 17:54:06	assigned_people_on_task	ORG588585401431	PRJjzxmbzag9e6v	USR189569223674
41175	2022-02-21 23:59:56	task_creation	ORG593668212572	PRJ436423104439	USR067850628645
41176	2022-02-21 23:56:51	project_creation_request_success	ORG593668212572	PRJ630204356710	USR067850628645

41177 rows × 5 columns

	Event	Description	Section
0	add_attendance_success	Successfully adding attendance of a person once	Labour
1	assigned_people_on_task	Assigned another person on a particular task	Task
2	attendance_list_accessed	Attendance list page opens on clicking this bu...	Labour
3	channel_message_sent	Message sent on chat feature	General
4	comment_create_success	Comment Created	General
5	dashboard_view_success	Dashboard Page Loading for a particular organi...	General
6	followup_button_clicked	Clicking Followup on a particular task/tasklog	Task
7	generate_report_success	Report for the overall work done generated for...	General
8	image_upload_success	User uploads an image on the app	General
9	indent_create_success	Material Added to Inventory	Material
10	material_profile_material_load	Material list page opens on clicking this button	Material
11	new_material_added	Material Added to Inventory in 'Material' Section	Material
12	project_creation_request_success	Successfully creating a new project	General
13	stock_material_updated	Updating Stock in the inventory	Material
14	task_creation	Successfully creating a task	Task
15	task_log_create_success	Successfully creating an update on a particula...	Task
16	thread_create_success	Successfully creating an Issue against a line ...	General

In [19]:
```
df1.event.nunique()
```

Out[19]:
```
17
```

In [20]:
```
df = pd.merge(df1,df2,left_on='event', right_on='Event',how='left')
df
```

Out[20]:

	created_at_time	event	org_id	project_id	user_id	Event	Description
0	2022-04-20 18:24:30	project_creation_request_success	ORG-2nufoaj370k	PRJ4k2kct6c5854	USRI50abktx6cc1	project_creation_request_success	Successfully creating a new project
1	2022-04-25 23:29:54	task_log_create_success	ORG-7fcq2k7b4xg	PRJ0ypqfy9v4kii	USRqki2dkqwj6xj	task_log_create_success	Successfully creating an update on a particula...
2	2022-04-25 23:29:54	task_creation	ORG-7fcq2k7b4xg	PRJ0ypqfy9v4kii	USRqki2dkqwj6xj	task_creation	Successfully creating a task
3	2022-04-25 23:28:23	project_creation_request_success	ORG-7fcq2k7b4xg	PRJfk9dy2gb6dhp	USRqki2dkqwj6xj	project_creation_request_success	Successfully creating a new project
4	2022-03-22 20:40:20	task_log_create_success	ORG-iluuim4club	PRJ1jrd11tr99dc	USRcsxgn7-vnztk	task_log_create_success	Successfully creating an update on a particula...
...	...	...	...	...	...	...	...
41172	2022-04-07 08:12:59	assigned_people_on_task	ORG588585401431	PRJ971575485352	USR811917964372	assigned_people_on_task	Assigned another person on a particular task
41173	2022-04-07 10:30:06	assigned_people_on_task	ORG588585401431	PRJ497168717769	USR811917964372	assigned_people_on_task	Assigned another person on a particular task
41174	2022-04-12 17:54:06	assigned_people_on_task	ORG588585401431	PRJjzxmbzag9e6v	USR189569223674	assigned_people_on_task	Assigned another person on a particular task
41175	2022-02-21 23:59:56	task_creation	ORG593668212572	PRJ436423104439	USR067850628645	task_creation	Successfully creating a task
41176	2022-02-21 23:56:51	project_creation_request_success	ORG593668212572	PRJ630204356710	USR067850628645	project_creation_request_success	Successfully creating a new project

41177 rows × 8 columns

In [22]:
```
df.drop(columns='Event' , inplace=True)
```

In [27]:
```
df
```

Out[27]:

	created_at_time	event	org_id	project_id	user_id	Description	Section
0	2022-04-20 18:24:30	project_creation_request_success	ORG-2nufoaj370k	PRJ4k2kct6c5854	USRl50abktx6cc1	Successfully creating a new project	General
1	2022-04-25 23:29:54	task_log_create_success	ORG-7fcq2k7b4xg	PRJ0ypqfy9v4kii	USRqki2dkqwj6xj	Successfully creating an update on a particula...	Task
2	2022-04-25 23:29:54	task_creation	ORG-7fcq2k7b4xg	PRJ0ypqfy9v4kii	USRqki2dkqwj6xj	Successfully creating a task	Task
3	2022-04-25 23:28:23	project_creation_request_success	ORG-7fcq2k7b4xg	PRJfk9dy2gb6dhp	USRqki2dkqwj6xj	Successfully creating a new project	General
4	2022-03-22 20:40:20	task_log_create_success	ORG-iluuim4club	PRJ1jrd11tr99dc	USRcsxgn7-vnztk	Successfully creating an update on a particula...	Task
...	...	...	...	...	...	...	...
41172	2022-04-07 08:12:59	assigned_people_on_task	ORG588585401431	PRJ971575485352	USR811917964372	Assigned another person on a particular task	Task
41173	2022-04-07 10:30:06	assigned_people_on_task	ORG588585401431	PRJ497168717769	USR811917964372	Assigned another person on a particular task	Task
41174	2022-04-12 17:54:06	assigned_people_on_task	ORG588585401431	PRJjzxmbzag9e6v	USR189569223674	Assigned another person on a particular task	Task
41175	2022-02-21 23:59:56	task_creation	ORG593668212572	PRJ436423104439	USR067850628645	Successfully creating a task	Task
41176	2022-02-21 23:56:51	project_creation_request_success	ORG593668212572	PRJ630204356710	USR067850628645	Successfully creating a new project	General

41177 rows × 7 columns

In [23]:
```
df.isna().sum()
```

Out[23]:
```
created_at_time      0
event                0
org_id               0
project_id         141
user_id              0
Description          0
Section              0
dtype: int64
```

In [24]:
```
df.created_at_time.min() , df.created_at_time.max()
```

Out[24]:
```
(Timestamp('2022-01-01 22:59:53'), Timestamp('2023-02-23 14:10:43'))
```

In [25]:
```
timeframe = df.created_at_time.max() - df.created_at_time.min()
timeframe
```

Out[25]:
```
Timedelta('417 days 15:10:50')
```

In [44]:
```
df.user_id.nunique()
```

Out[44]:
```
543
```

In [45]:
```
df.org_id.nunique()
```

Out[45]:
```
386
```

In [46]:
```
df.project_id.nunique()
```

Out[46]:
```
914
```

In [48]:
```
df.project_id.value_counts(dropna=False)
```

Out[48]:
```
project_id
PRJ256203650640    12820
PRJppirvslunbh9     1779
PRJ63dg0jj0k-vo     1481
PRJ8p2m3wyqmzs7     1348
PRJ355445863893     1280
                   ...
PRJ248835439387        1
PRJavjwjc8r2upz        1
PRJ385368385547        1
PRJ726446108695        1
PRJ630204356710        1
Name: count, Length: 915, dtype: int64
```

🔹 Insights:

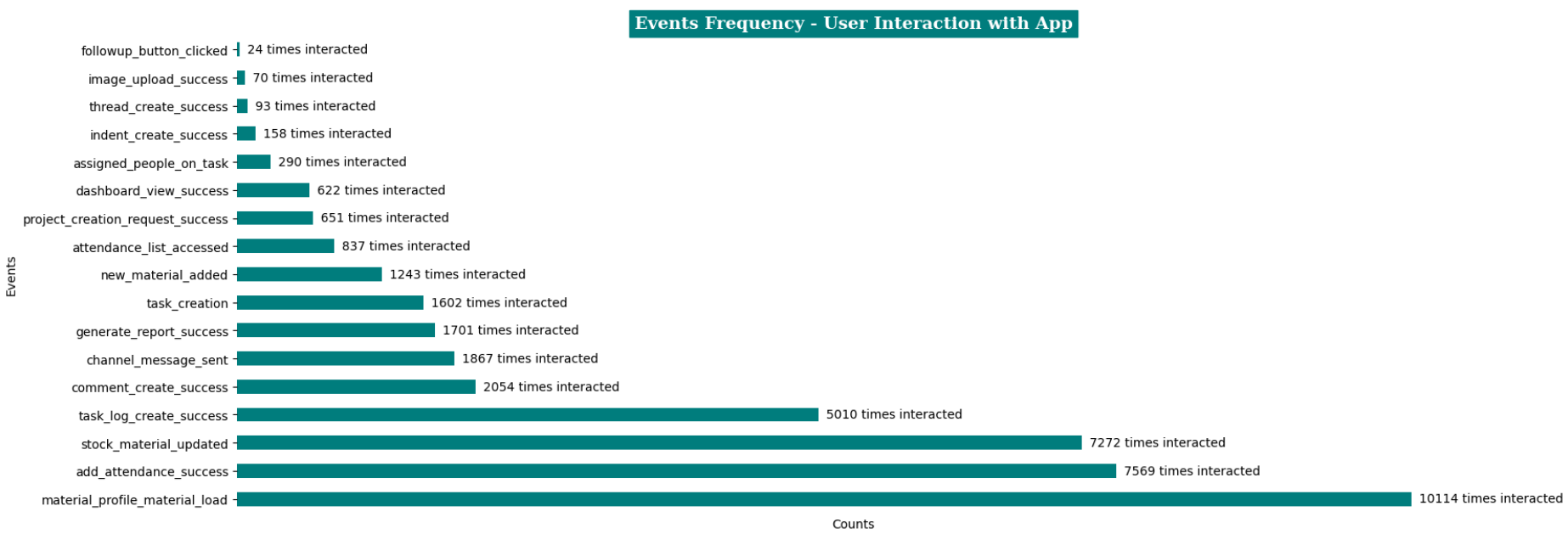
- There are 543 unique users of the App.

- There are 386 unique organizations who interact with the App.
- There are 914 known current Projects with 141 data with unknown project_id.

In [26]:
```
df.event.value_counts()
```

Out[26]:
```
event
material_profile_material_load      10114
add_attendance_success               7569
stock_material_updated               7272
task_log_create_success              5010
comment_create_success               2054
channel_message_sent                 1867
generate_report_success              1701
task_creation                        1602
new_material_added                   1243
attendance_list_accessed              837
project_creation_request_success      651
dashboard_view_success                622
assigned_people_on_task               290
indent_create_success                 158
thread_create_success                  93
image_upload_success                   70
followup_button_clicked                24
Name: count, dtype: int64
```

In [43]:
```
event_counts = df['event'].value_counts()

plt.figure(figsize=(18,7))
plt.style.use('default')
plt.style.use('seaborn-v0_8-bright')
a=event_counts.plot(kind='barh', color='teal')
a.bar_label(a.containers[0], label_type='edge', labels=[f'  {val} times interacted' for val in event_counts])
plt.title(f'Events Frequency - User Interaction with App',fontsize=14,fontfamily='serif',fontweight='bold',
          backgroundcolor='teal',color='w')
sns.despine(left=True , bottom=True)
plt.xlabel('Counts')
plt.ylabel('Events')
plt.xticks([])
plt.show()
```



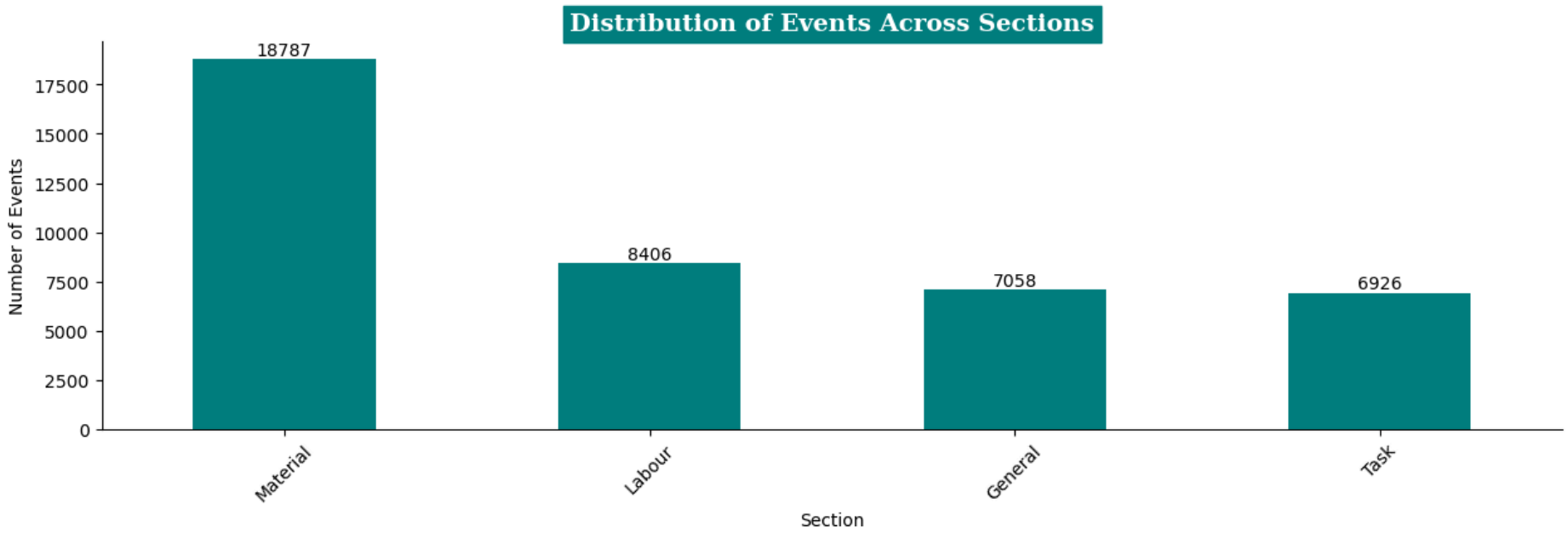
Insights:

- The Top 10 most common events and their frequencies:
  - 1. Material_profile_material_load - 10114 occurrences
  - 1. Add_attendance_success - 7569 occurrences
  - 1. Stock_material_updated - 7272 occurrences
  - 1. Task_log_create_success - 5010 occurrences
  - 1. Comment_create_success - 2054 occurrences
  - 1. Channel_message_sent - 1867 occurrences
  - 1. Generate_report_success - 1701 occurrences
  - 1. Task_creation - 1602 occurrences
  - 1. New_material_added - 1243 occurrences
  - 1. Attendance_list_accessed - 837 occurrences

> **This help us understand the most common interactions users have with the app.**

In [31]:
```
section_counts = df['Section'].value_counts()

plt.figure(figsize=(15,4))
plt.style.use('default')
plt.style.use('seaborn-v0_8-bright')

a=section_counts.plot(kind='bar', color='teal')
a.bar_label(a.containers[0], label_type='edge')
plt.title(f'Distribution of Events Across Sections',fontsize=14,fontfamily='serif',fontweight='bold',
          backgroundcolor='teal',color='w')
```

```
sns.despine()
plt.xlabel('Section')
plt.ylabel('Number of Events')
plt.xticks(rotation=45)
plt.show()
```



🔹 Insights:

- The No.of Events happend in each section:
  - Material section - 18787 events
  - Labour section - 8406 events
  - General Section - 7058 events
  - Task section - 6926 events

> **This tells us that Users interact with `Material Section` at an enormously higher rate compared to other sections through the App.**

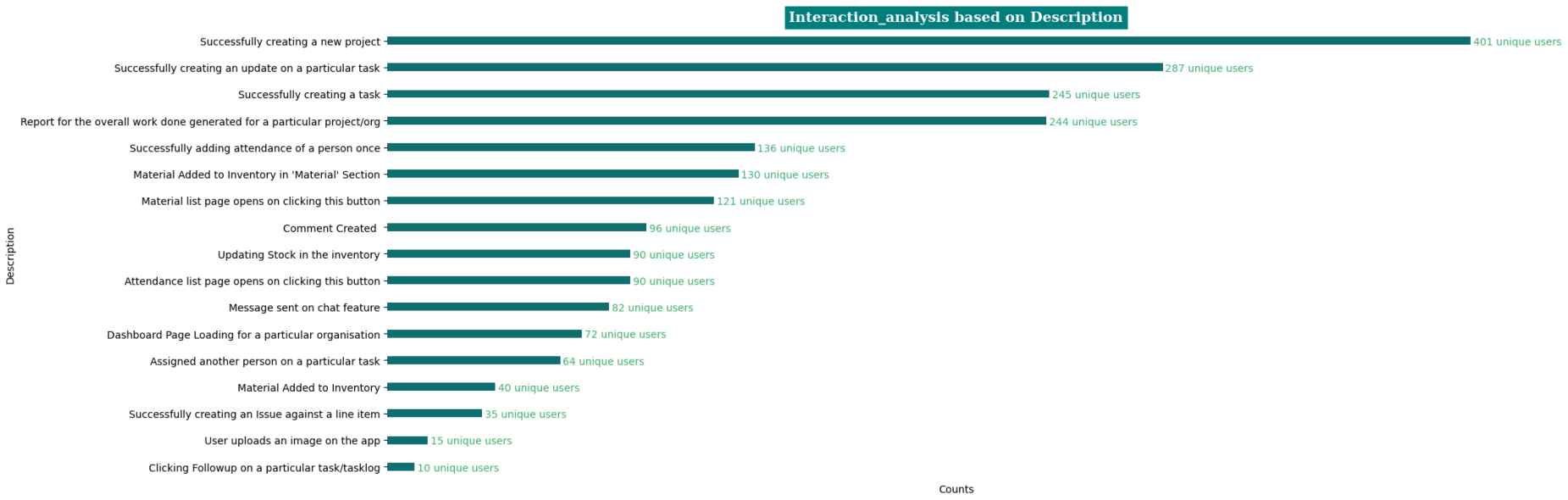
In [65]:
```
interaction_analysis = df.groupby('Description')['user_id'].nunique().sort_values(ascending=False)
iad = interaction_analysis.to_frame()
iad
```

Out[65]:

Description	user_id
Successfully creating a new project	401
Successfully creating an update on a particular task	287
Successfully creating a task	245
Report for the overall work done generated for a particular project/org	244
Successfully adding attendance of a person once	136
Material Added to Inventory in 'Material' Section	130
Material list page opens on clicking this button	121
Comment Created	96
Updating Stock in the inventory	90
Attendance list page opens on clicking this button	90
Message sent on chat feature	82
Dashboard Page Loading for a particular organisation	72
Assigned another person on a particular task	64
Material Added to Inventory	40
Successfully creating an Issue against a line item	35
User uploads an image on the app	15
Clicking Followup on a particular task/tasklog	10

In [87]:
```
plt.figure(figsize=(20,8))
plt.style.use('default')
plt.style.use('seaborn-v0_8-bright')

c1=sns.barplot(data=iad , x=iad.user_id , y=iad.index, orient='h' , color='teal' , width=0.3)

plt.title(f'Interaction_analysis based on Description',fontsize=14,fontfamily='serif',fontweight='bold',
          backgroundcolor='teal',color='w')
top_n = 17
for i in range(top_n):
    c1.annotate(f"{iad.user_id[i]} unique users", ((iad.user_id[i]+1),i+0.15), ha='left', va='baseline',color='mediumseagreen')
sns.despine(left=True , bottom=True)
plt.xlabel('Counts')
```

```
plt.ylabel('Description')
plt.xticks([])
plt.show()
```



🔹 Insights:

- The analysis of event descriptions and their impact on user interactions shows the following top 10 descriptions with unique user interactions:
  - 1. Successfully creating a new project: 401 unique users
  - 1. Successfully creating an update on a particular task: 287 unique users
  - 1. Successfully creating a task: 245 unique users
  - 1. Report for the overall work done generated for a particular project/org: 244 unique users
  - 1. Successfully adding attendance of a person once: 136 unique users
  - 1. Material Added to Inventory in 'Material' Section: 130 unique users
  - 1. Material list page opens on clicking this button: 121 unique users
  - 1. Comment Created: 96 unique users
  - 1. Updating Stock in the inventory: 90 unique users
  - 1. Attendance list page opens on clicking this button: 90 unique users

> **These insights provide valuable information on the user engagement triggered by different event descriptions.**

In [89]:
```
df.groupby(['event','Description'])['user_id'].nunique().sort_values(ascending=False)
```

Out[89]:

event	Description	
project_creation_request_success	Successfully creating a new project	401
task_log_create_success	Successfully creating an update on a particular task	287
task_creation	Successfully creating a task	245
generate_report_success	Report for the overall work done generated for a particular project/org	244
add_attendance_success	Successfully adding attendance of a person once	136
new_material_added	Material Added to Inventory in 'Material' Section	130
material_profile_material_load	Material list page opens on clicking this button	121
comment_create_success	Comment Created	96
attendance_list_accessed	Attendance list page opens on clicking this button	90
stock_material_updated	Updating Stock in the inventory	90
channel_message_sent	Message sent on chat feature	82
dashboard_view_success	Dashboard Page Loading for a particular organisation	72
assigned_people_on_task	Assigned another person on a particular task	64
indent_create_success	Material Added to Inventory	40
thread_create_success	Successfully creating an Issue against a line item	35
image_upload_success	User uploads an image on the app	15
followup_button_clicked	Clicking Followup on a particular task/tasklog	10

Name: user_id, dtype: int64

In [90]:
```
df.groupby(['event','Section'])['user_id'].nunique().sort_values(ascending=False)
```

Out[90]:

event	Section	
project_creation_request_success	General	401
task_log_create_success	Task	287
task_creation	Task	245
generate_report_success	General	244
add_attendance_success	Labour	136
new_material_added	Material	130
material_profile_material_load	Material	121
comment_create_success	General	96
attendance_list_accessed	Labour	90
stock_material_updated	Material	90
channel_message_sent	General	82
dashboard_view_success	General	72
assigned_people_on_task	Task	64
indent_create_success	Material	40
thread_create_success	General	35
image_upload_success	General	15
followup_button_clicked	Task	10

Name: user_id, dtype: int64

In [96]:
```
df.groupby('Section')[['event']].nunique()
```

Out[96]:

Section	event
General	7
Labour	2
Material	4
Task	4

In [116…
```
df.groupby(['Section','event'])['user_id'].nunique()
```

Out[116]:
```
Section   event
General   channel_message_sent                82
          comment_create_success              96
          dashboard_view_success              72
          generate_report_success            244
          image_upload_success                15
          project_creation_request_success   401
          thread_create_success               35
Labour    add_attendance_success             136
          attendance_list_accessed            90
Material  indent_create_success               40
          material_profile_material_load     121
          new_material_added                 130
          stock_material_updated              90
Task      assigned_people_on_task             64
          followup_button_clicked             10
          task_creation                      245
          task_log_create_success            287
Name: user_id, dtype: int64
```

In [122…
```
df['month'] = df['created_at_time'].dt.month
df['year'] = df['created_at_time'].dt.year
```

In [126…
```
df['day'] = df['created_at_time'].dt.day_name()
```

In [127…
```
df
```

Out[127]:

	created_at_time	event	org_id	project_id	user_id	Description	Section	month	year	
0	2022-04-20 18:24:30	project_creation_request_success	ORG-2nufoaj370k	PRJ4k2kct6c5854	USRl50abktx6cc1	Successfully creating a new project	General	4	2022	Wedne
1	2022-04-25 23:29:54	task_log_create_success	ORG-7fcq2k7b4xg	PRJ0ypqfy9v4kii	USRqki2dkqwj6xj	Successfully creating an update on a particula...	Task	4	2022	Mo
2	2022-04-25 23:29:54	task_creation	ORG-7fcq2k7b4xg	PRJ0ypqfy9v4kii	USRqki2dkqwj6xj	Successfully creating a task	Task	4	2022	Mo
3	2022-04-25 23:28:23	project_creation_request_success	ORG-7fcq2k7b4xg	PRJfk9dy2gb6dhp	USRqki2dkqwj6xj	Successfully creating a new project	General	4	2022	Mo
4	2022-03-22 20:40:20	task_log_create_success	ORG-iluuim4club	PRJ1jrd11tr99dc	USRcsxgn7-vnztk	Successfully creating an update on a particula...	Task	3	2022	Tue
...	...	...	...	...	...	...	...	...	...	
41172	2022-04-07 08:12:59	assigned_people_on_task	ORG588585401431	PRJ971575485352	USR811917964372	Assigned another person on a particular task	Task	4	2022	Thur
41173	2022-04-07 10:30:06	assigned_people_on_task	ORG588585401431	PRJ497168717769	USR811917964372	Assigned another person on a particular task	Task	4	2022	Thur
41174	2022-04-12 17:54:06	assigned_people_on_task	ORG588585401431	PRJjzxmbzag9e6v	USR189569223674	Assigned another person on a particular task	Task	4	2022	Tue
41175	2022-02-21 23:59:56	task_creation	ORG593668212572	PRJ436423104439	USR067850628645	Successfully creating a task	Task	2	2022	Mo
41176	2022-02-21 23:56:51	project_creation_request_success	ORG593668212572	PRJ630204356710	USR067850628645	Successfully creating a new project	General	2	2022	Mo

41177 rows × 10 columns

In [129…

```
month_mapping = {1: 'January', 2: 'February', 3: 'March', 4: 'April', 5: 'May', 6: 'June',
                 7: 'July', 8: 'August', 9: 'September', 10: 'October', 11: 'November', 12: 'December'}

df['month'] = df['month'].map(month_mapping)
df.head()
```

Out[129]:

	created_at_time	event	org_id	project_id	user_id	Description	Section	month	year	day	month
0	2022-04-20 18:24:30	project_creation_request_success	ORG-2nufoaj370k	PRJ4k2kct6c5854	USRl50abktx6cc1	Successfully creating a new project	General	April	2022	Wednesday	
1	2022-04-25 23:29:54	task_log_create_success	ORG-7fcq2k7b4xg	PRJ0ypqfy9v4kii	USRqki2dkqwj6xj	Successfully creating an update on a particula...	Task	April	2022	Monday	
2	2022-04-25 23:29:54	task_creation	ORG-7fcq2k7b4xg	PRJ0ypqfy9v4kii	USRqki2dkqwj6xj	Successfully creating a task	Task	April	2022	Monday	
3	2022-04-25 23:28:23	project_creation_request_success	ORG-7fcq2k7b4xg	PRJfk9dy2gb6dhp	USRqki2dkqwj6xj	Successfully creating a new project	General	April	2022	Monday	
4	2022-03-22 20:40:20	task_log_create_success	ORG-iluuim4club	PRJ1jrd11tr99dc	USRcsxgn7-vnztk	Successfully creating an update on a particula...	Task	March	2022	Tuesday	

In [137…

```
month_order = ['January', 'February', 'March', 'April', 'May','June', 'July', 'August', 'September',
               'October', 'November', 'December']
df['month']= pd.Categorical(df['month'],categories=month_order, ordered=True)
```

In [138…

```
day_order = ['Monday','Tuesday','Wednesday','Thrusday','Friday','Saturday','Sunday']
df['day']= pd.Categorical(df['day'],categories=day_order, ordered=True)
```

In [144…
```
Monthly_user_interaction = df.groupby(['year','month','day'])[['user_id']].count()
Monthly_user_interaction
```

Out[144]:

year	month	day	user_id
2022	January	Monday	279
		Tuesday	87
		Wednesday	122
		Thrusday	0
		Friday	96
...	...	...	...
2023	December	Wednesday	0
		Thrusday	0
		Friday	0
		Saturday	0
		Sunday	0

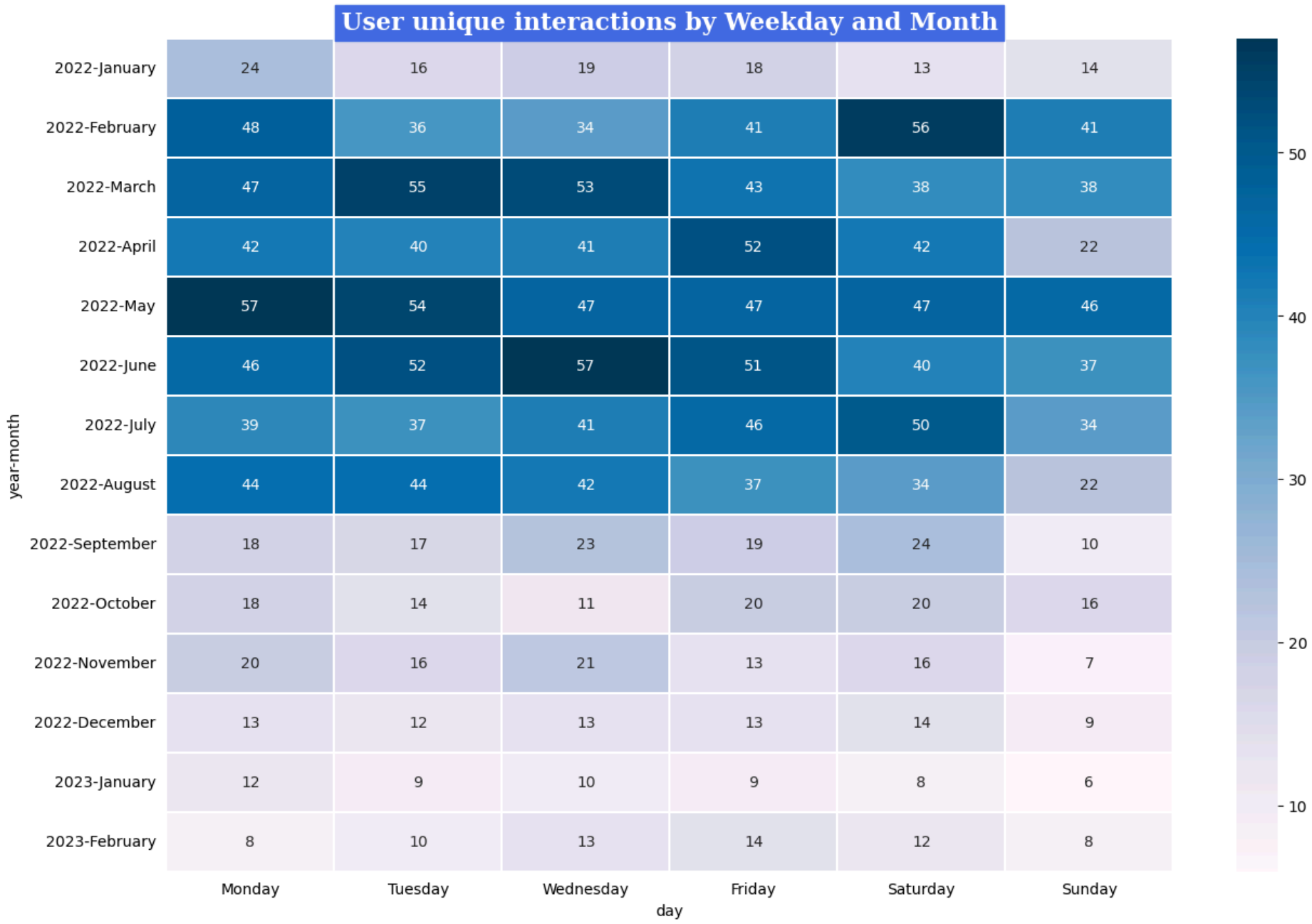
168 rows × 1 columns

In [158…
```
Monthly_unique_user_interaction_pivot = df.pivot_table(index=['year','month'],
                                                       columns='day',
                                                       values='user_id',
                                                       aggfunc=pd.Series.nunique).astype(int)
Monthly_unique_user_interaction_pivot
```

Out[158]:

	day	Monday	Tuesday	Wednesday	Friday	Saturday	Sunday
year	month						
2022	January	24	16	19	18	13	14
	February	48	36	34	41	56	41
	March	47	55	53	43	38	38
	April	42	40	41	52	42	22
	May	57	54	47	47	47	46
	June	46	52	57	51	40	37
	July	39	37	41	46	50	34
	August	44	44	42	37	34	22
	September	18	17	23	19	24	10
	October	18	14	11	20	20	16
	November	20	16	21	13	16	7
	December	13	12	13	13	14	9
2023	January	12	9	10	9	8	6
	February	8	10	13	14	12	8

In [172…
```
plt.figure(figsize=(15, 10))
plt.style.use('default')
plt.style.use('seaborn-v0_8-bright')
sns.heatmap(Monthly_unique_user_interaction_pivot, cmap='PuBu',annot=True, fmt='d' , linewidth=0.1)
plt.title("User unique interactions by Weekday and Month",fontsize=16,fontfamily='serif',fontweight='bold',
          backgroundcolor='royalblue',color='w')
plt.tick_params(axis='both', which='both', left=False, bottom=False)
plt.show()
```



In [160…

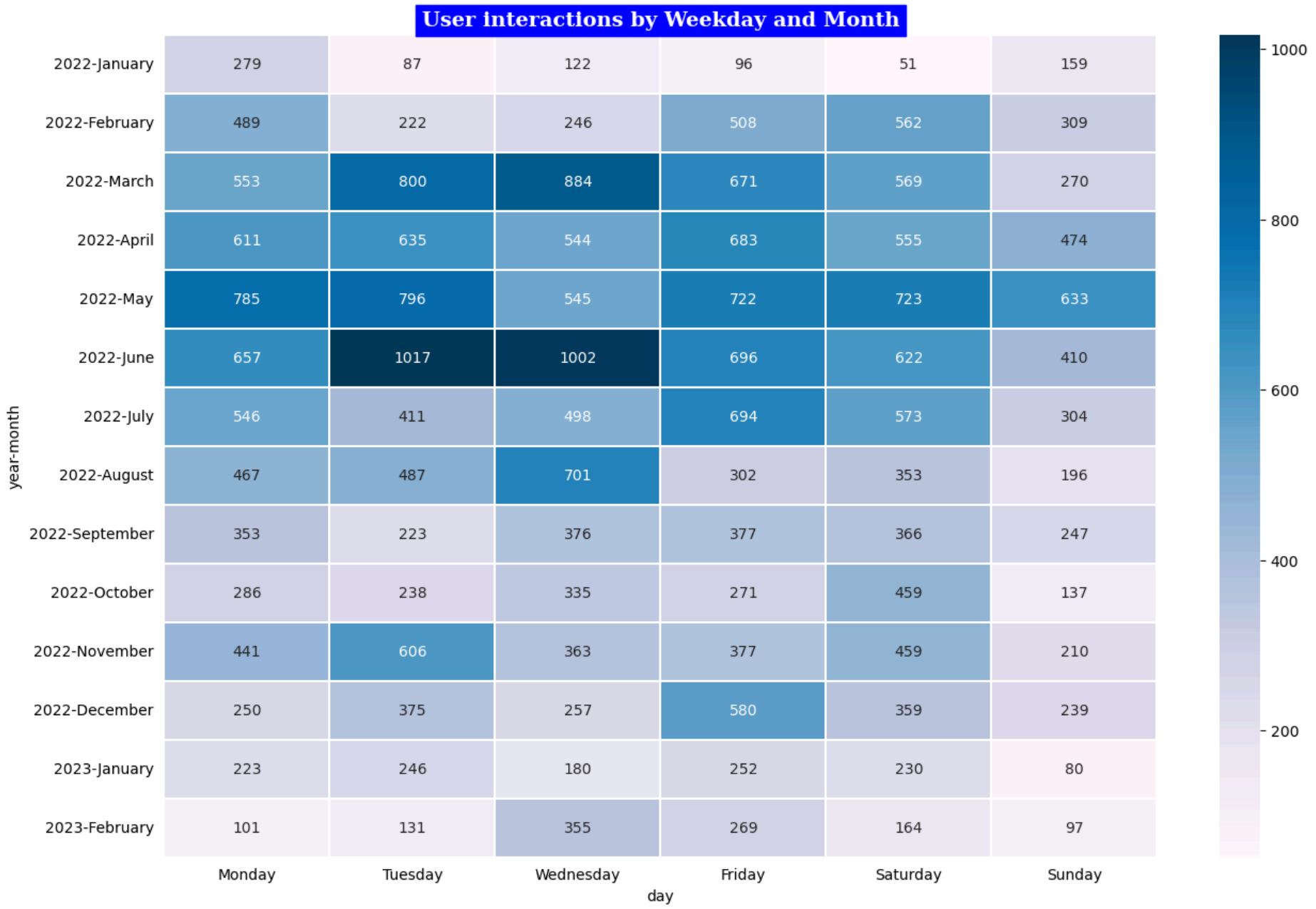
```
Monthly__user_interaction_pivot = df.pivot_table(index=['year','month'],
                                                 columns='day',
                                                 values='user_id',
                                                 aggfunc=pd.Series.count).astype(int)

Monthly__user_interaction_pivot
```

Out[160]:

year	month	Monday	Tuesday	Wednesday	Friday	Saturday	Sunday
2022	January	279	87	122	96	51	159
	February	489	222	246	508	562	309
	March	553	800	884	671	569	270
	April	611	635	544	683	555	474
	May	785	796	545	722	723	633
	June	657	1017	1002	696	622	410
	July	546	411	498	694	573	304
	August	467	487	701	302	353	196
	September	353	223	376	377	366	247
	October	286	238	335	271	459	137
	November	441	606	363	377	459	210
	December	250	375	257	580	359	239
2023	January	223	246	180	252	230	80
	February	101	131	355	269	164	97

In [173…

```
plt.figure(figsize=(15, 10))
plt.style.use('default')
plt.style.use('seaborn-v0_8-bright')
sns.heatmap(Monthly__user_interaction_pivot, cmap='PuBu',annot=True, fmt='d' , linewidth=0.1)
plt.title("User interactions by Weekday and Month",fontsize=14,fontfamily='serif',fontweight='bold',
          backgroundcolor='blue',color='w')
plt.tick_params(axis='both', which='both', left=False, bottom=False)
plt.show()
```



In [163…
```
df.sample()
```

Out[163]:

	created_at_time	event	org_id	project_id	user_id	Description	Section	month	year	day	mon
13449	2022-05-07 15:41:46	stock_material_updated	ORG400468153021	PRJ639384602336	USR939452321629	Updating Stock in the inventory	Material	May	2022	Saturday	

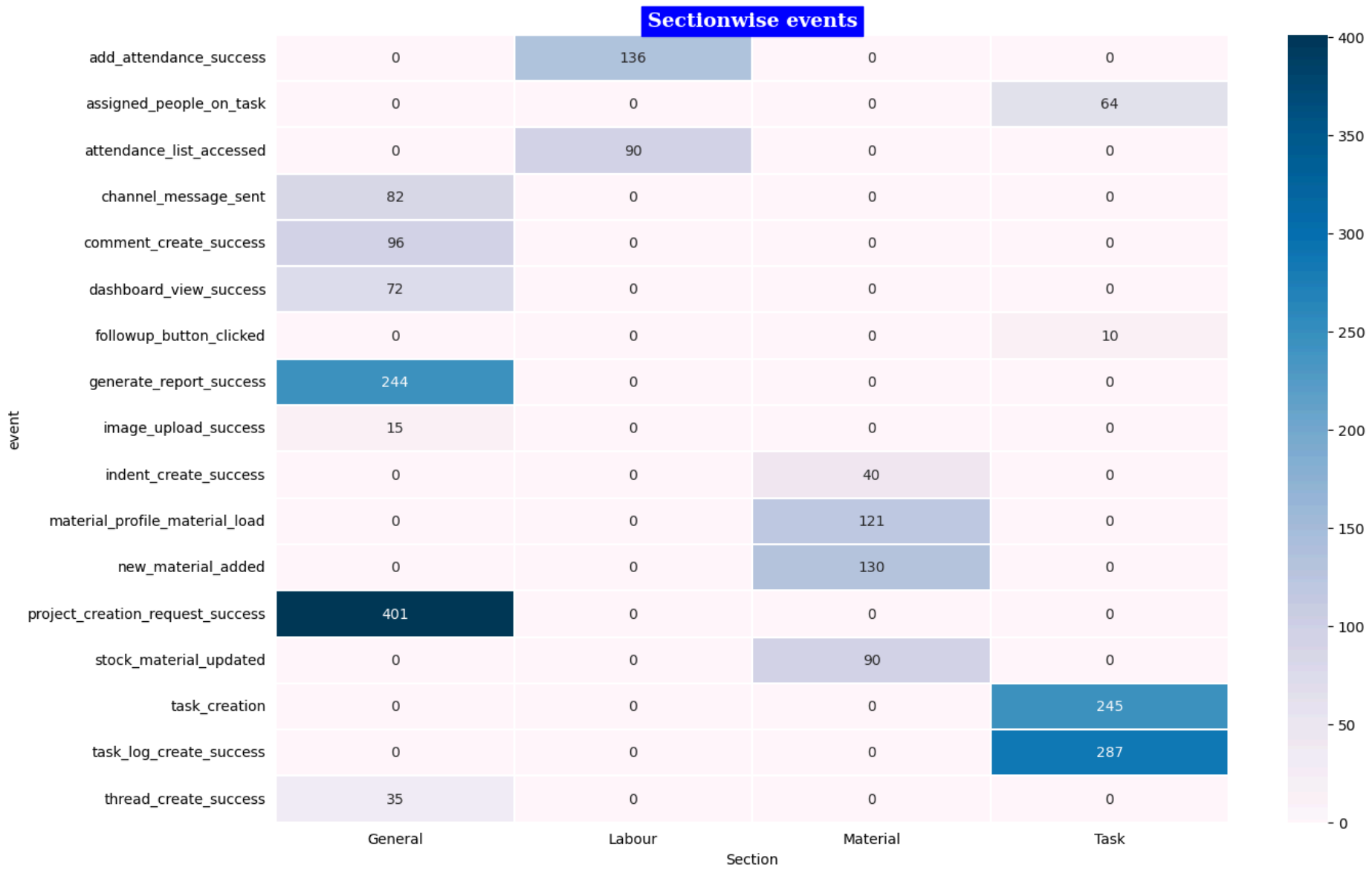
In [169…
```
Sectionwise_event = df.pivot_table(index='event', columns='Section', values='user_id', aggfunc=pd.Series.nunique).fillna(0).astyp
Sectionwise_event
```

Out[169]:

event \ Section	General	Labour	Material	Task
add_attendance_success	0	136	0	0
assigned_people_on_task	0	0	0	64
attendance_list_accessed	0	90	0	0
channel_message_sent	82	0	0	0
comment_create_success	96	0	0	0
dashboard_view_success	72	0	0	0
followup_button_clicked	0	0	0	10
generate_report_success	244	0	0	0
image_upload_success	15	0	0	0
indent_create_success	0	0	40	0
material_profile_material_load	0	0	121	0
new_material_added	0	0	130	0
project_creation_request_success	401	0	0	0
stock_material_updated	0	0	90	0
task_creation	0	0	0	245
task_log_create_success	0	0	0	287
thread_create_success	35	0	0	0

In [177…
```
plt.figure(figsize=(15, 10))
plt.style.use('default')
plt.style.use('seaborn-v0_8-bright')
sns.heatmap(Sectionwise_event, cmap='PuBu',annot=True, fmt='d' , linewidth=0.1)
plt.title('Sectionwise events',fontsize=14,fontfamily='serif',fontweight='bold',backgroundcolor='blue',color='w')
```

```
plt.tick_params(axis='both', which='both', left=False, bottom=False)
plt.show()
```



In [179…

```
event_description = df.pivot_table(index='Description', columns='event', values='user_id', aggfunc=pd.Series.nunique).fillna(0).a
event_description
```

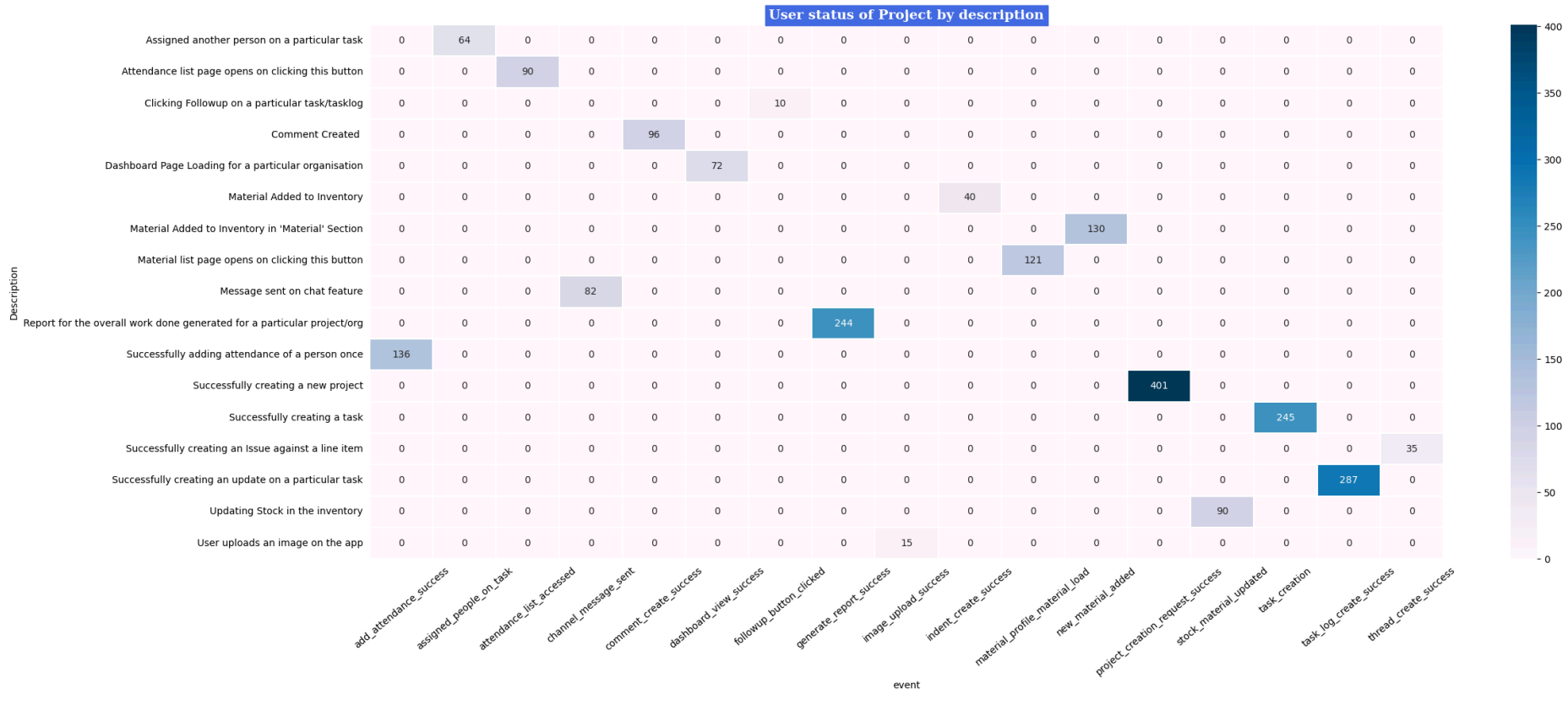
Out[179]:

event Description	add_attendance_success	assigned_people_on_task	attendance_list_accessed	channel_message_sent	comment_create_success	dashboard_view_s
Assigned another person on a particular task	0	64	0	0	0	
Attendance list page opens on clicking this button	0	0	90	0	0	
Clicking Followup on a particular task/tasklog	0	0	0	0	0	
Comment Created	0	0	0	0	96	
Dashboard Page Loading for a particular organisation	0	0	0	0	0	
Material Added to Inventory	0	0	0	0	0	
Material Added to Inventory in 'Material' Section	0	0	0	0	0	
Material list page opens on clicking this button	0	0	0	0	0	
Message sent on chat feature	0	0	0	82	0	
Report for the overall work done generated for a particular project/org	0	0	0	0	0	
Successfully adding attendance of a person once	136	0	0	0	0	
Successfully creating a new project	0	0	0	0	0	
Successfully creating a task	0	0	0	0	0	
Successfully creating an Issue against a line item	0	0	0	0	0	
Successfully creating an update on a particular task	0	0	0	0	0	
Updating Stock in the inventory	0	0	0	0	0	
User uploads an image on the app	0	0	0	0	0	

In [188…

```
plt.figure(figsize=(25, 10))
plt.style.use('default')
plt.style.use('seaborn-v0_8-bright')
sns.heatmap(event_description, cmap='PuBu',annot=True, fmt='d' , linewidth=0.1)
```

```
plt.title('User status of Project by description',fontsize=14,fontfamily='serif',fontweight='bold',
          backgroundcolor='royalblue',color='w')
plt.tick_params(axis='both', which='both', left=False, bottom=False)
plt.xticks(rotation=40)
plt.show()
```



Additional exploration - on Tableau

link - https://public.tableau.com/app/profile/kasi.muthuveerappan/viz/powerplayassesment-set4/userinteractionbasedontheevents#1

🌟 Insights:

- **TimeFrame and Dataset Infographics:**
  - The data was given ***417 days*** dating from `Jan 2022 till Feb 2023`.
- **User Engagement Metrics:**
  - There are `543` unique users , `386` unique organizations and `914 known Projects` with 141 data with unknown project_id interact with the app.
  - User_d -> `USR509149973276` is the most frequent app user with 5438 events interactions
  - Project_id -> `Prj256203650640` is the project with most unique users interacted with the app 5832 times.
- **Time-based Patterns:**
  - Mostly was used during the month of `March till June` and users engagement gradually decreases.
  - May be Because of the `seasonality` -> ***summer*** is most apt for construction purposes.
  - `92 Organizations` with event description as `Successfully created the project` during ***Feb-2022***
  - `81 projects` interacted with app for `435 times` to update the event description as '***Sucessfully creating an update on a particular Task***' during the month *Feb-2022*.
- **Event Frequency:**
  - The analysis of event descriptions and their impact on user interactions shows the following top 10 descriptions with unique user interactions:
    - 1. Successfully creating a new project: 401 unique users
    - 1. Successfully creating an update on a particular task: 287 unique users
    - 1. Successfully creating a task: 245 unique users
    - 1. Report for the overall work done generated for a particular project/org: 244 unique users
    - 1. Successfully adding attendance of a person once: 136 unique users
- **Event Sections Analysis:**
  - The No.of Events happend in each section:
    - Material section - 18787 events
    - Labour section - 8406 events
    - General Section - 7058 events
    - Task section - 6926 events
      - **This tells us that Users interact with `Material Section` at an enormously higher rate compared to other sections through the App.**
- **User Feedback Analysis:**
  - If available, consider incorporating user feedback data to gain qualitative insights into user experiences and from organizations perspective to grow feasibly.
- **Trigger Identification:**

- Patterns from timeframe indicates the there is `High User Engagement` during the ***Summer Seasons*** which is more opted by the consumers and therefore the the construction buisness hypes during the month the ***march till july***.
- The Highest number of user interacting with the app mostly use the `Material Section` widely throughout the year and to communicate the status of the projects through the event description.
- `Quality Materials` correlates the `User satisfaction` which is the major trigger for making the organizations to becoming more engaged and active and some use for internal office communications.
- The `Powerplay App` is used extensively by the organization to deal with ***Huge projects, status communication , material procurement, quality making and to attain customer satisfaction*** .
- These Factors act as a ***Major Triggers for the Poweplay App interaction***.
