LPL_CaseStudy

September 25, 2022

1 LPL Case Study

1.1 Part 1: Analytics Framework

1.1.1 Goals:

- Which metrics are critical to evaluate?
- At a high-level, what data would be required for these metrics and how might you source it?
- Are there any data sensitivities?

Imagine you're starting a new business that provides a service for Financial Advisors. Currently, some Advisors independently provide the service to their end-clients. Other Advisors do not provide the service at all since it can be time consuming and requires an investment upfront to build the necessary skillset. Your new business gives the Advisor the opportunity to outsource this service to you, saving time for Advisors previously providing the service and expanding the business proposition of those not qualified to provide it. The Advisors are your direct customers making payment to you; they also act as a liaison between you and the end-client. Advisors can subscribe to the service for a 6-month period in two ways: (1) pay as you go (pay for only what is needed at a premium cost per service) or (2) contract with minimum commitment (discounted cost per service with total contract amount paid in equal amounts each month). You are part of your business' management team that oversees both the business itself and the team of operational staff that does the tangible service work.

Which metrics are critical to evaluate?

- Finance:
  - What is our cost to provide the service?
  - Given that we have different services / pricing levels, what is our profit margin for each service?
  - What are profits and costs for each type of subscription?
  - Do certain service levels require higher operational expenses, and should these only be offered to Advisors who are managing higher amounts?
- Usage:
  - Of the Advisors who use the service, what percentage use each type of service?
  - Of the Advisors who use the service, what percentage use each type of subscription?
  - Over time, do we see different usage levels for each type of service we offer?
  - Are we seeing a change over time in the percentage of our Advisors who use the service vs the Advisors who don't?
  - What is the average retention / churn rate for Advisors with our services vs Advisors without our services vs overall?

        * By service type?

- Clients:
  - For each service level that we offer, what percentage of end-clients are within each level, out of the clients who have Advisors that use at least one service
  - For the Advisors that switch from not using our service to using at least one service, do they see an increase in the number of clients? Is their client growth higher after starting service vs client growth prior to using the service?
  - Feedback / ratings / satisfaction among clients for each type of service offered
  - Do we see higher satisfaction rates among clients who have an Advisor that uses at least one service?
  - Conversely, do we see lower satisfcation rates among clients who have an Advisor that does not use at least one service?
  - What is the average client count for Advisors who use the service vs Advisors who don't?
    * What is the average count by service type?

At a high-level, what data would be required for these metrics and how might you source it?

- Finance:
  - expenses / profit / revenue for each type of service
    * operations / internal teams / cost of infrastructure and tools / revenue by service type
  - expenses / profit / revenue for each type of subscription
    * operations / internal teams / cost of infrastructure and tools / revenue by subscription type
  - the amount each Advisor manages
    * sourced from the Advisors
- Usage
  - what type of service does each Advisor use
    * sourced from the Advisors
  - what type of subscription does each Advisor use
    * sourced from the Advisors
  - total Advisor count
    * internal data / sourced from the Advisors

- Clients
  - count of clients by month for each service type
    * sourced from the Advisors
  - count of clients by month for each Advisor
    * sourced from the Advisors
  - client feedback
    * survey data, form on a website
  - how many clients leave each month
    * internal data or the Advisors

Are there any data sensitivities?

- Any PII related to clients should be scrubbed out, except for maybe age (but DOB should not be included)
- Advisor PII should be scrubbed from the data and only referred to by ID unless we need to communicate with them directly
- Once we determine what metrics to use, we should also determine which of those metrics can be shared with Advisors and clients and which metrics should stay internal to management

1.2 Part 2: Data Analysis

1.2.1 Goals:

- Explore the data and see what insights you can find
- Determine how best to visualize the data
- Start with a descriptive analysis of the historical data
  - What is essential to know?
  - Profitability, sales, operational efficiency & productivity… are there trends, good or bad?
- Bonus (not required) Perform a simple predictive analysis to forecast one of the metrics

[4]:
```
<sqlite3.Connection at 0x7fc7a23919d0>
```

Pricing

[5]:

	ServiceType	Price(\$/client)	StartDate	EndDate
0	A	250.0	2022-01-01	2022-03-31
1	B	500.0	2022-01-01	2022-03-31
2	C	1000.0	2022-01-01	2022-03-31
3	A	275.0	2022-04-01	9999-12-31
4	B	550.0	2022-04-01	9999-12-31
5	C	1100.0	2022-04-01	9999-12-31

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 6 entries, 0 to 5
Data columns (total 4 columns):
 #   Column            Non-Null Count  Dtype
---  ------            --------------  -----
 0   ServiceType       6 non-null      object
 1   Price(\$/client)  6 non-null      float64
 2   StartDate         6 non-null      object
 3   EndDate           6 non-null      object
dtypes: float64(1), object(3)
memory usage: 320.0+ bytes
```

```
/opt/anaconda3/lib/python3.7/site-packages/pandas/core/indexing.py:1637:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  self._setitem_single_block(indexer, value, name)
```

[8]:

	ServiceType	Price(\$/client)	StartDate	EndDate	Tier
0	A	250.0	2022-01-01	2022-03-31	Tier 1
1	B	500.0	2022-01-01	2022-03-31	Tier 1
2	C	1000.0	2022-01-01	2022-03-31	Tier 1
3	A	275.0	2022-04-01	9999-12-31	Tier 2
4	B	550.0	2022-04-01	9999-12-31	Tier 2
5	C	1100.0	2022-04-01	9999-12-31	Tier 2

Expenses

[9]:

	ExpenseType	Cost(\$/FTE/hr)	WorkingHours(hrs/FTE/month)	Personnel(FTEs)
0	Ops	50	160	16
1	Mgmt	300	160	4

[10]:

	ExpenseType	Cost(\$/FTE/hr)	WorkingHours(hrs/FTE/month)	Personnel(FTEs)	\
0	Ops	50	160	16	
1	Mgmt	300	160	4	

	Cost per FTE	Total FTE Cost
0	8000	128000
1	48000	192000

[11]: 320000

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2 entries, 0 to 1
Data columns (total 6 columns):
 #   Column                       Non-Null Count  Dtype
---  ------                       --------------  -----
 0   ExpenseType                  2 non-null      object
 1   Cost(\$/FTE/hr)              2 non-null      int64
 2   WorkingHours(hrs/FTE/month)  2 non-null      int64
 3   Personnel(FTEs)              2 non-null      int64
 4   Cost per FTE                 2 non-null      int64
 5   Total FTE Cost               2 non-null      int64
dtypes: int64(5), object(1)
memory usage: 224.0+ bytes
```

[13]:

	ExpenseType	Cost(\$/FTE/hr)
0	Ops	50
1	Ops	50
2	Ops	50
3	Ops	50
4	Ops	50
..	…	…
995	Ops	50
996	Ops	50
997	Ops	50

```
998         Ops              50
999         Ops              50

[1000 rows x 2 columns]
```

Advisor Info

[14]:

	AdvisorID	Channel	Tenure(yrs)
0	E76FeEaD-3a68-4BfA-84c2-1eAd8a9cB6d2	Independent	3.776759
1	4db26009-a669-47Ea-9B55-e1aa5AD49528	Independent	10.517504
2	b12967cE-e00a-4A2a-9749-0c4A4bd59e7A	Institution	3.588722
3	56AD396B-451c-42C6-8821-39fe9e7F83Ef	Independent	6.740541
4	5fE17b4C-9669-4148-B920-0f7d9C4757dA	Independent	8.893632
..	…	…	…
94	1C0d618f-9487-49A1-Ac0b-F25C6Fa23577	Independent	7.210525
95	F19F976E-bc89-4f80-9C19-C96DD19a07D1	Institution	9.194763
96	5Df74960-3a18-4759-A0f7-574d458C6F8F	Institution	7.450213
97	2FCBC349-0FC9-4d6B-8219-f93d02909729	Independent	8.275422
98	4a0d03df-1B08-4fB7-B8a3-042FF3300d72	Independent	1.799496

[99 rows x 3 columns]

[15]: 99

Mean Tenure: 7.047214884771054

Channel Count:
Independent 64
Institution 35
Name: Channel, dtype: int64

Mean Tenure by Channel:
Channel
Independent 6.898702
Institution 7.318782
Name: Tenure(yrs), dtype: float64

Services Provided

[17]:

	AdvisorID	\
0	5e9c8e62-a491-4ca7-8e7b-eee50ded2f43	
1	55507370-3a1b-435c-b954-c9a5172d2d9f	
2	34b4072b-e017-4e61-8f9a-ec5e8731d285	
3	c2d87a03-eaaf-4246-aeae-eae2915afcd9	
4	1f19d6fc-f172-4ab4-bb1c-5e067b824bf8	
..	…	

```
995  adf17392-0ab2-4b50-adb8-00b152fb7a05
996  d4e0ca4d-4657-475c-af16-5f5bb48ffacd
997  d618ac35-635b-4f0e-ab84-5e19ca2b5d9f
998  21c4e526-9b04-447a-abbe-adc09e468326
999  f987abff-a18f-420b-8648-c8e7ce6a0840

                                ClientID ServiceType RequestDate  \
0    92f9db72-588f-4caf-bc5c-81f689ea2e19           B  2022-02-26
1    cc8cab57-8184-480f-b66d-98b2bd331376           C  2022-03-04
2    40c0f46e-d289-470a-9b23-85fbd61e5b5f           B  2022-05-17
3    2c368dbc-05f7-4d95-96fe-270ec9ba812b           A  2022-02-07
4    277514fe-6d66-4c4f-aacb-26065fd9d5d8           B  2022-05-09
..                                    …         …          …
995  89a93b24-7210-4edd-882e-a19333754b95           C  2022-03-14
996  4411ea80-3425-4d72-92a4-bb50a26fe5f6           A  2022-05-19
997  b2614e43-81a6-429e-a7dc-6b0b0bcfc0a5           C  2022-06-07
998  bdafc176-7059-41ec-8429-b5d8d6994308           A  2022-02-15
999  22f872ac-75d4-4d4d-a55d-8837626ed32e           A  2022-05-24

    CompleteDate  Duration  OpsTeam  OpsHours
0     2022-03-02         4        1       8.0
1     2022-03-11         7        1      12.4
2     2022-05-22         5        2       7.2
3     2022-02-11         4        1       4.6
4     2022-05-13         4        2       8.6
..           …       …      …        …
995   2022-03-21         7        3      10.8
996   2022-05-21         2        3       2.5
997   2022-06-15         8        1      11.8
998   2022-02-20         5        2       6.1
999   2022-05-28         4        2       4.1

[1000 rows x 8 columns]

99
947
```

[19]:
```
A    349
C    341
B    310
Name: ServiceType, dtype: int64
```

[20]:
```
2    371
3    347
1    282
Name: OpsTeam, dtype: int64

<class 'pandas.core.frame.DataFrame'>
```

```
RangeIndex: 1000 entries, 0 to 999
Data columns (total 8 columns):
 #   Column        Non-Null Count  Dtype
---  ------        --------------  -----
 0   AdvisorID     1000 non-null   object
 1   ClientID      1000 non-null   object
 2   ServiceType   1000 non-null   object
 3   RequestDate   1000 non-null   datetime64[ns]
 4   CompleteDate  1000 non-null   object
 5   Duration      1000 non-null   int64
 6   OpsTeam       1000 non-null   int64
 7   OpsHours      1000 non-null   float64
dtypes: datetime64[ns](1), float64(1), int64(2), object(4)
memory usage: 62.6+ KB
```

[23]:

	AdvisorID	ClientID	ServiceType	RequestDate	CompleteDate	Duration	OpsTeam	OpsHours	Tier
0	5e9c8e62-a491-4ca7-8e7b-eee50ded2f43	92f9db72-588f-4caf-bc5c-81f689ea2e19	B	2022-02-26	2022-03-02	4	1	8.0	Tier 1
1	55507370-3a1b-435c-b954-c9a5172d2d9f	cc8cab57-8184-480f-b66d-98b2bd331376	C	2022-03-04	2022-03-11	7	1	12.4	Tier 1
2	34b4072b-e017-4e61-8f9a-ec5e8731d285	40c0f46e-d289-470a-9b23-85fbd61e5b5f	B	2022-05-17	2022-05-22	5	2	7.2	Tier 2
3	c2d87a03-eaaf-4246-aeae-eae2915afcd9	2c368dbc-05f7-4d95-96fe-270ec9ba812b	A	2022-02-07	2022-02-11	4	1	4.6	Tier 1
4	1f19d6fc-f172-4ab4-bb1c-5e067b824bf8	277514fe-6d66-4c4f-aacb-26065fd9d5d8	B	2022-05-09	2022-05-13	4	2	8.6	Tier 2
..	…	…	…	…	…	…	…	…	…
995	adf17392-0ab2-4b50-adb8-00b152fb7a05	89a93b24-7210-4edd-882e-a19333754b95	C	2022-03-14	2022-03-15	1	1	2.0	Tier 1
996	d4e0ca4d-4657-475c-af16-5f5bb48ffacd	4411ea80-3425-4d72-92a4-bb50a26fe5f6	A	2022-05-19	2022-05-20	1	1	2.0	Tier 1
997	d618ac35-635b-4f0e-ab84-5e19ca2b5d9f	b2614e43-81a6-429e-a7dc-6b0b0bcfc0a5	C	2022-06-07	2022-06-08	1	1	2.0	Tier 1
998	21c4e526-9b04-447a-abbe-adc09e468326	bdafc176-7059-41ec-8429-b5d8d6994308	A	2022-02-15	2022-02-16	1	1	2.0	Tier 1
999	f987abff-a18f-420b-8648-c8e7ce6a0840	22f872ac-75d4-4d4d-a55d-8837626ed32e	A	2022-05-24	2022-05-25	1	1	2.0	Tier 1

```
..           …       …      …       …     …
995   2022-03-21         7        3      10.8  Tier 1
996   2022-05-21         2        3       2.5  Tier 2
997   2022-06-15         8        1      11.8  Tier 2
998   2022-02-20         5        2       6.1  Tier 1
999   2022-05-28         4        2       4.1  Tier 2

[1000 rows x 9 columns]
```

[24]:
```
Tier 1    503
Tier 2    497
Name: Tier, dtype: int64
```

[25]:
```
                                AdvisorID  \
0    5e9c8e62-a491-4ca7-8e7b-eee50ded2f43
1    2684751e-33aa-4b1c-b495-5105c479cdb3
2    6c8a8b56-4e6d-42ab-9179-e8875c522ce6
3    1647b7e6-7a5d-49e3-9d3b-83a0dc41bb4d
4    48b964ec-a15d-4ad3-a5c3-8252294da5a0
..                                    …
995  5154a635-dfe3-4a25-9b82-b1b0f76b1ce3
996  6c8a8b56-4e6d-42ab-9179-e8875c522ce6
997  ac223aa9-dae5-4a82-9b80-d2333e47c1b0
998  69a64884-25f3-4a51-bec2-2464f1b7bc41
999  d618ac35-635b-4f0e-ab84-5e19ca2b5d9f

                                ClientID ServiceType RequestDate  \
0    92f9db72-588f-4caf-bc5c-81f689ea2e19           B  2022-02-26
1    6d9e4b09-a946-4245-9bfb-b0cc673745db           B  2022-01-26
2    e63f5b6c-1e4f-40b4-bede-4e1aa752b432           B  2022-02-16
3    cdcef44c-6a89-47d0-b312-2d22e23193b6           B  2022-02-01
4    18de2217-ab4e-4656-a056-b67964891b1c           B  2022-01-26
..                                    …           …           …
995  43e3ba2c-933a-4cfd-813a-a5cff8d51f8a           C  2022-05-20
996  1113749b-d128-42e2-a698-26f696888b6e           C  2022-04-02
997  2336b6a4-f49a-4a08-980b-45436c76d4c0           C  2022-04-18
998  b9b4f525-887e-4046-b40b-64f300640c82           C  2022-04-30
999  b2614e43-81a6-429e-a7dc-6b0b0bcfc0a5           C  2022-06-07

    CompleteDate  Duration  OpsTeam  OpsHours    Tier  Price(\$/client)  \
0     2022-03-02         4        1       8.0  Tier 1             500.0
1     2022-01-31         5        2       9.8  Tier 1             500.0
2     2022-02-21         5        1       8.3  Tier 1             500.0
3     2022-02-05         4        1       8.3  Tier 1             500.0
4     2022-02-02         7        2      10.3  Tier 1             500.0
..           …       …      …       …     …                  …
995   2022-05-29         9        2      10.8  Tier 2            1100.0
```

```
996   2022-04-09         7        1      11.0  Tier 2            1100.0
997   2022-04-24         6        3      10.4  Tier 2            1100.0
998   2022-05-07         7        3      10.4  Tier 2            1100.0
999   2022-06-15         8        1      11.8  Tier 2            1100.0

      StartDate     EndDate
0     2022-01-01  2022-03-31
1     2022-01-01  2022-03-31
2     2022-01-01  2022-03-31
3     2022-01-01  2022-03-31
4     2022-01-01  2022-03-31
..           …         …
995   2022-04-01  9999-12-31
996   2022-04-01  9999-12-31
997   2022-04-01  9999-12-31
998   2022-04-01  9999-12-31
999   2022-04-01  9999-12-31

[1000 rows x 12 columns]
```

[26]:
```
Tier 1    503
Tier 2    497
Name: Tier, dtype: int64

99
947

2022-01-01 00:00:00
2022-06-29 00:00:00

2022-01-04
2022-07-05
```

[30]:
```
Tier                          Tier 1       Tier 2
Duration        count    503.000000   497.000000
                mean       5.210736     5.146881
                std        1.977796     2.006179
                min        1.000000     1.000000
                25%        4.000000     4.000000
                50%        5.000000     5.000000
                75%        7.000000     7.000000
                max       11.000000    10.000000
OpsTeam         count    503.000000   497.000000
                mean       2.027833     2.102616
                std        0.792910     0.787716
                min        1.000000     1.000000
                25%        1.000000     1.000000
                50%        2.000000     2.000000
```

```
                    75%       3.000000     3.000000
                    max       3.000000     3.000000
OpsHours            count   503.000000   497.000000
                    mean      8.269781     8.095976
                    std       3.335067     3.443874
                    min       1.700000     1.500000
                    25%       5.200000     4.900000
                    50%       8.300000     8.200000
                    75%      11.500000    11.200000
                    max      14.700000    15.000000
Price(\$/client)    count   503.000000   497.000000
                    mean    591.948310   631.891348
                    std     316.180173   348.797682
                    min     250.000000   275.000000
                    25%     250.000000   275.000000
                    50%     500.000000   550.000000
                    75%    1000.000000  1100.000000
                    max    1000.000000  1100.000000
```

[32]:

```
                              AdvisorID                              ClientID  \
0    5e9c8e62a4914ca78e7beee50ded2f43  92f9db72-588f-4caf-bc5c-81f689ea2e19
1    2684751e33aa4b1cb4955105c479cdb3  6d9e4b09-a946-4245-9bfb-b0cc673745db
2    6c8a8b564e6d42ab9179e8875c522ce6  e63f5b6c-1e4f-40b4-bede-4e1aa752b432
3    1647b7e67a5d49e39d3b83a0dc41bb4d  cdcef44c-6a89-47d0-b312-2d22e23193b6
4    48b964eca15d4ad3a5c38252294da5a0  18de2217-ab4e-4656-a056-b67964891b1c
..                                ...                                   ...
995  5154a635dfe34a259b82b1b0f76b1ce3  43e3ba2c-933a-4cfd-813a-a5cff8d51f8a
996  6c8a8b564e6d42ab9179e8875c522ce6  1113749b-d128-42e2-a698-26f696888b6e
997  ac223aa9dae54a829b80d2333e47c1b0  2336b6a4-f49a-4a08-980b-45436c76d4c0
998  69a6488425f34a51bec22464f1b7bc41  b9b4f525-887e-4046-b40b-64f300640c82
999  d618ac35635b4f0eab845e19ca2b5d9f  b2614e43-81a6-429e-a7dc-6b0b0bcfc0a5

    ServiceType RequestDate CompleteDate  Duration  OpsTeam  OpsHours    Tier  \
0             B  2022-02-26   2022-03-02         4        1       8.0  Tier 1
1             B  2022-01-26   2022-01-31         5        2       9.8  Tier 1
2             B  2022-02-16   2022-02-21         5        1       8.3  Tier 1
3             B  2022-02-01   2022-02-05         4        1       8.3  Tier 1
4             B  2022-01-26   2022-02-02         7        2      10.3  Tier 1
..          ...         ...          ...       ...      ...       ...     ...
995           C  2022-05-20   2022-05-29         9        2      10.8  Tier 2
996           C  2022-04-02   2022-04-09         7        1      11.0  Tier 2
997           C  2022-04-18   2022-04-24         6        3      10.4  Tier 2
998           C  2022-04-30   2022-05-07         7        3      10.4  Tier 2
999           C  2022-06-07   2022-06-15         8        1      11.8  Tier 2

     Price(\$/client)   StartDate     EndDate      Channel  Tenure(yrs)
0               500.0  2022-01-01  2022-03-31  Independent     3.608293
```

```
1               500.0  2022-01-01  2022-03-31  Independent     3.510060
2               500.0  2022-01-01  2022-03-31  Independent     8.474467
3               500.0  2022-01-01  2022-03-31  Independent     7.152175
4               500.0  2022-01-01  2022-03-31  Independent    12.610493
..                ...         ...         ...          ...          ...
995            1100.0  2022-04-01  9999-12-31  Independent     3.490497
996            1100.0  2022-04-01  9999-12-31  Independent     8.474467
997            1100.0  2022-04-01  9999-12-31  Institution     0.452880
998            1100.0  2022-04-01  9999-12-31  Institution    12.523012
999            1100.0  2022-04-01  9999-12-31  Independent     9.194800

[1000 rows x 14 columns]
```

[33]:

```
                           AdvisorID                              ClientID  \
0    5e9c8e62a4914ca78e7beee50ded2f43  92f9db72-588f-4caf-bc5c-81f689ea2e19
1    2684751e33aa4b1cb4955105c479cdb3  6d9e4b09-a946-4245-9bfb-b0cc673745db
2    6c8a8b564e6d42ab9179e8875c522ce6  e63f5b6c-1e4f-40b4-bede-4e1aa752b432
3    1647b7e67a5d49e39d3b83a0dc41bb4d  cdcef44c-6a89-47d0-b312-2d22e23193b6
4    48b964eca15d4ad3a5c38252294da5a0  18de2217-ab4e-4656-a056-b67964891b1c
..                                ...                                   ...
995  5154a635dfe34a259b82b1b0f76b1ce3  43e3ba2c-933a-4cfd-813a-a5cff8d51f8a
996  6c8a8b564e6d42ab9179e8875c522ce6  1113749b-d128-42e2-a698-26f696888b6e
997  ac223aa9dae54a829b80d2333e47c1b0  2336b6a4-f49a-4a08-980b-45436c76d4c0
998  69a6488425f34a51bec22464f1b7bc41  b9b4f525-887e-4046-b40b-64f300640c82
999  d618ac35635b4f0eab845e19ca2b5d9f  b2614e43-81a6-429e-a7dc-6b0b0bcfc0a5

    ServiceType RequestDate CompleteDate  Duration  OpsTeam  OpsHours    Tier  \
0             B  2022-02-26   2022-03-02         4        1       8.0  Tier 1
1             B  2022-01-26   2022-01-31         5        2       9.8  Tier 1
2             B  2022-02-16   2022-02-21         5        1       8.3  Tier 1
3             B  2022-02-01   2022-02-05         4        1       8.3  Tier 1
4             B  2022-01-26   2022-02-02         7        2      10.3  Tier 1
..          ...         ...          ...       ...      ...       ...     ...
995           C  2022-05-20   2022-05-29         9        2      10.8  Tier 2
996           C  2022-04-02   2022-04-09         7        1      11.0  Tier 2
997           C  2022-04-18   2022-04-24         6        3      10.4  Tier 2
998           C  2022-04-30   2022-05-07         7        3      10.4  Tier 2
999           C  2022-06-07   2022-06-15         8        1      11.8  Tier 2

     Price(\$/client)   StartDate     EndDate      Channel  Tenure(yrs)  \
0               500.0  2022-01-01  2022-03-31  Independent     3.608293
1               500.0  2022-01-01  2022-03-31  Independent     3.510060
2               500.0  2022-01-01  2022-03-31  Independent     8.474467
3               500.0  2022-01-01  2022-03-31  Independent     7.152175
4               500.0  2022-01-01  2022-03-31  Independent    12.610493
..                ...         ...         ...          ...          ...
995            1100.0  2022-04-01  9999-12-31  Independent     3.490497
```

```
996            1100.0  2022-04-01  9999-12-31  Independent     8.474467
997            1100.0  2022-04-01  9999-12-31  Institution     0.452880
998            1100.0  2022-04-01  9999-12-31  Institution    12.523012
999            1100.0  2022-04-01  9999-12-31  Independent     9.194800

    ExpenseType Cost(\$/FTE/hr)
0           Ops              50
1           Ops              50
2           Ops              50
3           Ops              50
4           Ops              50
..          …              …
995         Ops              50
996         Ops              50
997         Ops              50
998         Ops              50
999         Ops              50

[1000 rows x 16 columns]
```

[34]:

```
                           AdvisorID                            ClientID  \
0    5e9c8e62a4914ca78e7beee50ded2f43  92f9db72-588f-4caf-bc5c-81f689ea2e19
1    2684751e33aa4b1cb4955105c479cdb3  6d9e4b09-a946-4245-9bfb-b0cc673745db
2    6c8a8b564e6d42ab9179e8875c522ce6  e63f5b6c-1e4f-40b4-bede-4e1aa752b432
3    1647b7e67a5d49e39d3b83a0dc41bb4d  cdcef44c-6a89-47d0-b312-2d22e23193b6
4    48b964eca15d4ad3a5c38252294da5a0  18de2217-ab4e-4656-a056-b67964891b1c
..                                …                                   …
995  5154a635dfe34a259b82b1b0f76b1ce3  43e3ba2c-933a-4cfd-813a-a5cff8d51f8a
996  6c8a8b564e6d42ab9179e8875c522ce6  1113749b-d128-42e2-a698-26f696888b6e
997  ac223aa9dae54a829b80d2333e47c1b0  2336b6a4-f49a-4a08-980b-45436c76d4c0
998  69a6488425f34a51bec22464f1b7bc41  b9b4f525-887e-4046-b40b-64f300640c82
999  d618ac35635b4f0eab845e19ca2b5d9f  b2614e43-81a6-429e-a7dc-6b0b0bcfc0a5

    ServiceType RequestDate CompleteDate  Duration  OpsTeam  OpsHours    Tier  \
0             B  2022-02-26   2022-03-02         4        1       8.0  Tier 1
1             B  2022-01-26   2022-01-31         5        2       9.8  Tier 1
2             B  2022-02-16   2022-02-21         5        1       8.3  Tier 1
3             B  2022-02-01   2022-02-05         4        1       8.3  Tier 1
4             B  2022-01-26   2022-02-02         7        2      10.3  Tier 1
..          …          …           …       …       …       …     …
995           C  2022-05-20   2022-05-29         9        2      10.8  Tier 2
996           C  2022-04-02   2022-04-09         7        1      11.0  Tier 2
997           C  2022-04-18   2022-04-24         6        3      10.4  Tier 2
998           C  2022-04-30   2022-05-07         7        3      10.4  Tier 2
999           C  2022-06-07   2022-06-15         8        1      11.8  Tier 2

     Price(\$/client)   StartDate     EndDate      Channel  Tenure(yrs)  \
```

```
0               500.0  2022-01-01  2022-03-31  Independent     3.608293
1               500.0  2022-01-01  2022-03-31  Independent     3.510060
2               500.0  2022-01-01  2022-03-31  Independent     8.474467
3               500.0  2022-01-01  2022-03-31  Independent     7.152175
4               500.0  2022-01-01  2022-03-31  Independent    12.610493
..                ...         ...         ...          ...          ...
995            1100.0  2022-04-01  9999-12-31  Independent     3.490497
996            1100.0  2022-04-01  9999-12-31  Independent     8.474467
997            1100.0  2022-04-01  9999-12-31  Institution     0.452880
998            1100.0  2022-04-01  9999-12-31  Institution    12.523012
999            1100.0  2022-04-01  9999-12-31  Independent     9.194800

    ExpenseType Cost(\$/FTE/hr)
0           Ops              50
1           Ops              50
2           Ops              50
3           Ops              50
4           Ops              50
..          ...             ...
995         Ops              50
996         Ops              50
997         Ops              50
998         Ops              50
999         Ops              50

[1000 rows x 16 columns]
```

[35]:

```
                           AdvisorID                            ClientID  \
0    5e9c8e62a4914ca78e7beee50ded2f43  92f9db72-588f-4caf-bc5c-81f689ea2e19
1    2684751e33aa4b1cb4955105c479cdb3  6d9e4b09-a946-4245-9bfb-b0cc673745db
2    6c8a8b564e6d42ab9179e8875c522ce6  e63f5b6c-1e4f-40b4-bede-4e1aa752b432
3    1647b7e67a5d49e39d3b83a0dc41bb4d  cdcef44c-6a89-47d0-b312-2d22e23193b6
4    48b964eca15d4ad3a5c38252294da5a0  18de2217-ab4e-4656-a056-b67964891b1c
..                                ...                                   ...
995  5154a635dfe34a259b82b1b0f76b1ce3  43e3ba2c-933a-4cfd-813a-a5cff8d51f8a
996  6c8a8b564e6d42ab9179e8875c522ce6  1113749b-d128-42e2-a698-26f696888b6e
997  ac223aa9dae54a829b80d2333e47c1b0  2336b6a4-f49a-4a08-980b-45436c76d4c0
998  69a6488425f34a51bec22464f1b7bc41  b9b4f525-887e-4046-b40b-64f300640c82
999  d618ac35635b4f0eab845e19ca2b5d9f  b2614e43-81a6-429e-a7dc-6b0b0bcfc0a5

    ServiceType RequestDate CompleteDate  Duration  OpsTeam  OpsHours    Tier  \
0             B  2022-02-26   2022-03-02         4        1       8.0  Tier 1
1             B  2022-01-26   2022-01-31         5        2       9.8  Tier 1
2             B  2022-02-16   2022-02-21         5        1       8.3  Tier 1
3             B  2022-02-01   2022-02-05         4        1       8.3  Tier 1
4             B  2022-01-26   2022-02-02         7        2      10.3  Tier 1
..          ...         ...          ...       ...      ...       ...     ...
```

```
995           C  2022-05-20   2022-05-29         9        2      10.8  Tier 2
996           C  2022-04-02   2022-04-09         7        1      11.0  Tier 2
997           C  2022-04-18   2022-04-24         6        3      10.4  Tier 2
998           C  2022-04-30   2022-05-07         7        3      10.4  Tier 2
999           C  2022-06-07   2022-06-15         8        1      11.8  Tier 2

     Price(\$/client)   StartDate     EndDate      Channel  Tenure(yrs)  \
0               500.0  2022-01-01  2022-03-31  Independent     3.608293
1               500.0  2022-01-01  2022-03-31  Independent     3.510060
2               500.0  2022-01-01  2022-03-31  Independent     8.474467
3               500.0  2022-01-01  2022-03-31  Independent     7.152175
4               500.0  2022-01-01  2022-03-31  Independent    12.610493
..                ...         ...         ...          ...          ...
995            1100.0  2022-04-01  9999-12-31  Independent     3.490497
996            1100.0  2022-04-01  9999-12-31  Independent     8.474467
997            1100.0  2022-04-01  9999-12-31  Institution     0.452880
998            1100.0  2022-04-01  9999-12-31  Institution    12.523012
999            1100.0  2022-04-01  9999-12-31  Independent     9.194800

    ExpenseType  Cost(\$/FTE/hr)  OpsCost    Net
0           Ops             50.0    400.0  100.0
1           Ops             50.0    490.0   10.0
2           Ops             50.0    415.0   85.0
3           Ops             50.0    415.0   85.0
4           Ops             50.0    515.0  -15.0
..          ...              ...      ...    ...
995         Ops             50.0    540.0  560.0
996         Ops             50.0    550.0  550.0
997         Ops             50.0    520.0  580.0
998         Ops             50.0    520.0  580.0
999         Ops             50.0    590.0  510.0

[1000 rows x 18 columns]
```

[36]:

```
          Duration      OpsTeam     OpsHours  Price(\$/client)  Tenure(yrs)  \
count  1000.000000  1000.000000  1000.000000       1000.000000  1000.000000
mean      5.179000     2.065000     8.183400        611.800000     6.673803
std       1.991212     0.790823     3.388998        333.223721     3.712929
min       1.000000     1.000000     1.500000        250.000000     0.073957
25%       4.000000     1.000000     5.100000        275.000000     3.510060
50%       5.000000     2.000000     8.200000        500.000000     6.740541
75%       7.000000     3.000000    11.300000       1000.000000     9.302468
max      11.000000     3.000000    15.000000       1100.000000    18.544990

       Cost(\$/FTE/hr)      OpsCost          Net
count           1000.0  1000.000000  1000.000000
mean              50.0   409.170000   202.630000
```

```
std               0.0   169.449917   188.541855
min              50.0    75.000000  -130.000000
25%              50.0   255.000000    55.000000
50%              50.0   410.000000   130.000000
75%              50.0   565.000000   395.000000
max              50.0   750.000000   610.000000

count    1000.000000
mean      202.630000
std       188.541855
min      -130.000000
25%        55.000000
50%       130.000000
75%       395.000000
max       610.000000
Name: Net, dtype: float64
Total Gain:  202630.0
```

[38]:
```
2046.7676767676767

Tier
Tier 1     89765.0
Tier 2    112865.0
Name: Net, dtype: float64
```

[39]:

Tier	count	mean	std	min	25%	50%	75%	max
Tier 1	503.0	178.459245	172.940821	-130.0	37.5	110.0	370.0	520.0
Tier 2	497.0	227.092555	200.338040	-80.0	75.0	140.0	460.0	610.0

```
Channel
Independent    157515.0
Institution     45115.0
Name: Net, dtype: float64
```

[40]:

Channel	count	mean	std	min	25%	50%	75%	max
Independent	794.0	198.381612	189.097029	-130.0	50.0	130.0	395.0	610.0
Institution	206.0	219.004854	185.932993	-100.0	70.0	140.0	390.0	605.0

```
ServiceType
A     15675.0
B     34980.0
C    151975.0
Name: Net, dtype: float64
```

[41]:

ServiceType	count	mean	std	min	25%	50%	75%	max

```
A            349.0   44.914040  61.999662 -130.0    0.0   40.0   90.0  200.0
B            310.0  112.838710  60.527667  -50.0   75.0  115.0  150.0  270.0
C            341.0  445.674487  71.107724  265.0  390.0  445.0  495.0  610.0
```

[42]:
```
Tier             A      B      C
Net         202.63 202.63 202.63
ServiceType
Tier 1         167    160    176
Tier 2         182    150    165
```

[43]:
```
Tier             A      B      C
Net         202.63 202.63 202.63
ServiceType
Tier 1       0.167   0.16  0.176
Tier 2       0.182   0.15  0.165
```

[44]:
```
ServiceType          A           B           C
Tier
Tier 1       29.011976   92.187500  398.693182
Tier 2       59.505495  134.866667  495.787879
```

[45]:
```
             Duration                            Net                          \
ServiceType         A        B         C          A           B           C
Tier
Tier 1       3.556886  4.48125  7.443182  29.011976   92.187500  398.693182
Tier 2       3.510989  4.54000  7.503030  59.505495  134.866667  495.787879

             OpsHours                        OpsTeam
ServiceType         A         B          C         A        B         C
Tier
Tier 1       4.41976  8.156250  12.026136  1.988024  2.06875  2.028409
Tier 2       4.30989  8.302667  12.084242  2.137363  2.06000  2.103030
```

```
10.1010101010101
```

[46]:
```
AdvisorID
5e9c8e62a4914ca78e7beee50ded2f43    29
5154a635dfe34a259b82b1b0f76b1ce3    26
c2d87a03eaaf4246aeaeeae2915afcd9    26
2fcbc3490fc94d6b8219f93d02909729    26
a9c5c8c40d6945b3b81f8681212d2c30    25
1c0d618f948749a1ac0bf25c6fa23577    24
2fb8687f53ff4d23b3cfb411088e040d    24
d618ac35635b4f0eab845e19ca2b5d9f    23
308530c2ec154aa6818e71d788a58ed4    22
80530bcadde449b9b78eb297080a5f8b    21
Name: ClientID, dtype: int64
```

```
333.3333333333333
```

[47]:
```
ServiceType
A    349
B    310
C    341
Name: AdvisorID, dtype: int64
```

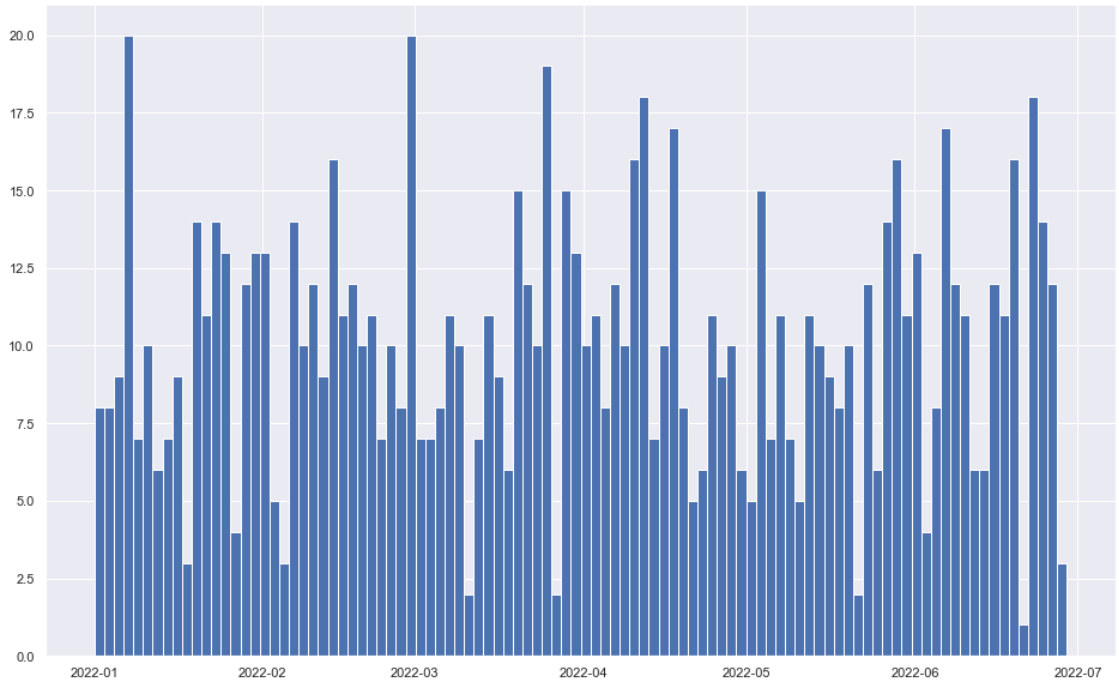
[48]:
```
Tier
Tier 1    503
Tier 2    497
Name: AdvisorID, dtype: int64
```

[49]:
```
ServiceType      A     B      C
Tier
Tier 1       0.167  0.16  0.176
Tier 2       0.182  0.15  0.165
```

[50]:
```
ServiceType    A    B    C
Tier
Tier 1       167  160  176
Tier 2       182  150  165
```

[51]:
```
5.179
```

[52]:
```
<AxesSubplot:>
```



[53]:

	AdvisorID	ClientID
615	56ad396b451c42c6882139fe9e7f83ef	7ea9227c-c688-4a92-b354-bd1e3dda8511
586	84a0d08ee26142bbbc4099457b4ae116	3f107e29-73d4-4761-af93-40ac5c5c6152
539	c8001904c1cb4566acbf48edbabb79b2	dc561c2c-7606-47e3-9cad-6f5dbcefb929
145	2684751e33aa4b1cb4955105c479cdb3	92e878f8-007c-409b-8ce8-944caa68b17a
83	cd611ea32b1b48ab86b70be2ea60e400	9cfd2a3d-edf0-4cc5-9b07-0231d13739b4
..	…	…
897	7b8c9125f91e4091946fca00cd8d6374	262d3877-ba4f-4cc6-9cc8-cb304f120b28
955	4908392fb0154135a01cae46c97719dc	77ce6db5-3090-4c7c-a2be-32b9bcca59fb
847	308530c2ec154aa6818e71d788a58ed4	d3a9d4f6-3034-4627-8a9f-3dd814f88747
952	a45ad3ec0bee44ae8a17b966212daa40	e7cf31d1-8e16-480e-a479-49965bc3ac6f
846	defcc9db9afa4d8c808269d170c59f69	7db732d5-b1d2-4ee5-8716-11e761302fe2

	ServiceType	RequestDate	CompleteDate	Duration	OpsTeam	OpsHours	Tier
615	A	2022-01-01	2022-01-04	3	1	2.3	Tier 1
586	A	2022-01-02	2022-01-04	2	1	3.1	Tier 1
539	A	2022-01-01	2022-01-05	4	3	5.1	Tier 1
145	B	2022-01-01	2022-01-05	4	3	8.9	Tier 1
83	B	2022-01-01	2022-01-05	4	1	8.5	Tier 1
..	…	…	…	…	…	…	…
897	C	2022-06-25	2022-07-03	8	3	12.0	Tier 2
955	C	2022-06-27	2022-07-03	6	1	14.9	Tier 2
847	C	2022-06-27	2022-07-04	7	3	13.2	Tier 2
952	C	2022-06-28	2022-07-05	7	3	10.2	Tier 2
846	C	2022-06-28	2022-07-05	7	3	13.7	Tier 2

	Price(\$/client)	StartDate	EndDate	Channel	Tenure(yrs)
615	250.0	2022-01-01	2022-03-31	Independent	6.740541
586	250.0	2022-01-01	2022-03-31	Independent	10.854447
539	250.0	2022-01-01	2022-03-31	Independent	9.360093
145	500.0	2022-01-01	2022-03-31	Independent	3.510060
83	500.0	2022-01-01	2022-03-31	Institution	14.405360
..	…	…	…	…	…
897	1100.0	2022-04-01	9999-12-31	Institution	9.649223
955	1100.0	2022-04-01	9999-12-31	Institution	8.361103
847	1100.0	2022-04-01	9999-12-31	Independent	11.200232
952	1100.0	2022-04-01	9999-12-31	Independent	12.874037
846	1100.0	2022-04-01	9999-12-31	Independent	6.164114

	ExpenseType	Cost(\$/FTE/hr)	OpsCost	Net	RunningNet
615	Ops	50.0	115.0	135.0	135.0
586	Ops	50.0	155.0	95.0	230.0
539	Ops	50.0	255.0	-5.0	225.0
145	Ops	50.0	445.0	55.0	280.0
83	Ops	50.0	425.0	75.0	355.0
..	…	…	…	…	…

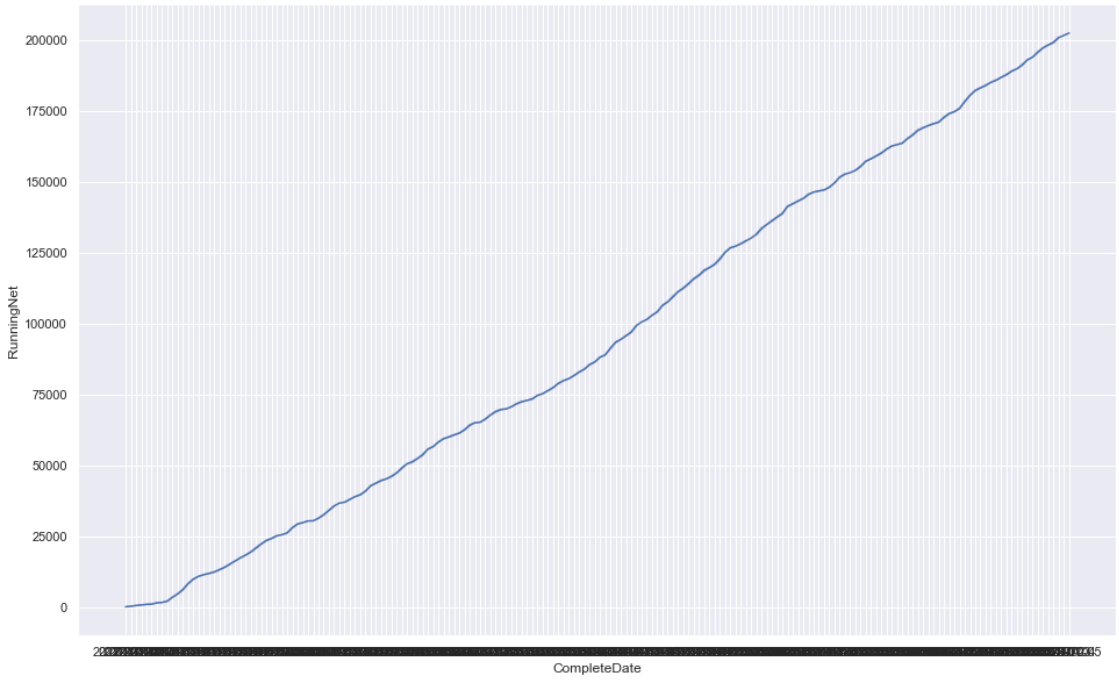
```
897         Ops              50.0    600.0  500.0    200830.0
955         Ops              50.0    745.0  355.0    201185.0
847         Ops              50.0    660.0  440.0    201625.0
952         Ops              50.0    510.0  590.0    202215.0
846         Ops              50.0    685.0  415.0    202630.0

[1000 rows x 19 columns]

202630.0
2046.7676767676767
```

[54]:
```
202.92723173376058
```

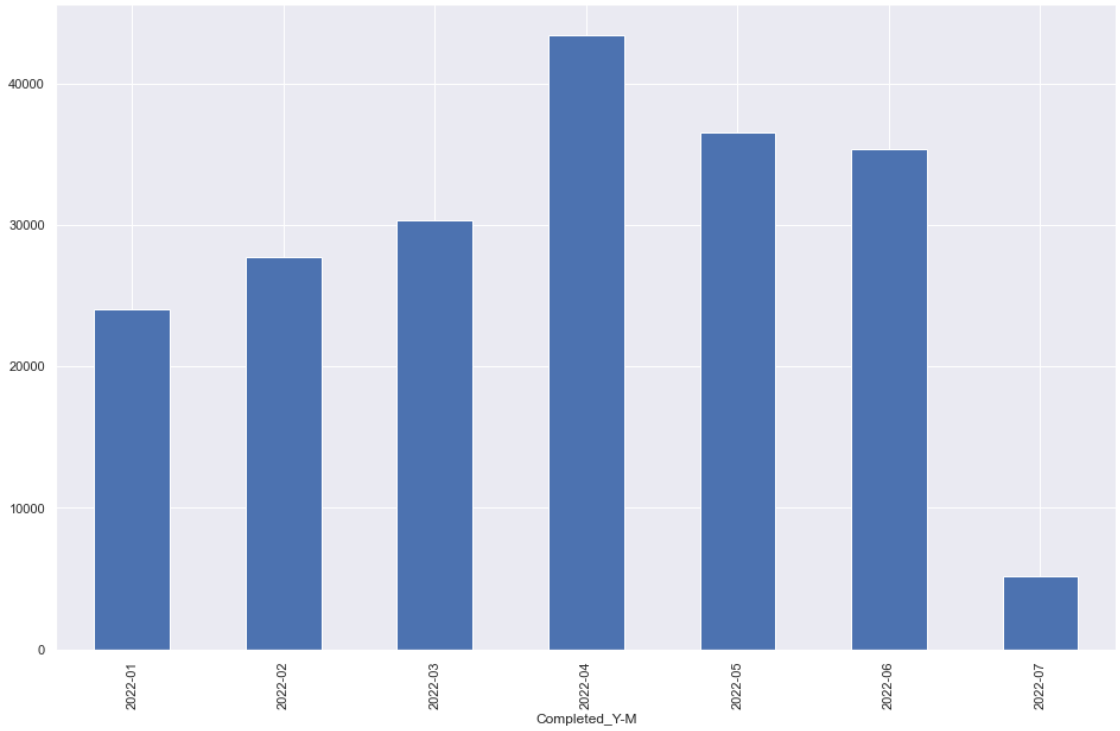
[55]:
```
                              AdvisorID                              ClientID  \
615  56ad396b451c42c6882139fe9e7f83ef  7ea9227c-c688-4a92-b354-bd1e3dda8511
586  84a0d08ee26142bbbc4099457b4ae116  3f107e29-73d4-4761-af93-40ac5c5c6152
539  c8001904c1cb4566acbf48edbabb79b2  dc561c2c-7606-47e3-9cad-6f5dbcefb929
145  2684751e33aa4b1cb4955105c479cdb3  92e878f8-007c-409b-8ce8-944caa68b17a
83   cd611ea32b1b48ab86b70be2ea60e400  9cfd2a3d-edf0-4cc5-9b07-0231d13739b4
..                                ...                                   ...
897  7b8c9125f91e4091946fca00cd8d6374  262d3877-ba4f-4cc6-9cc8-cb304f120b28
955  4908392fb0154135a01cae46c97719dc  77ce6db5-3090-4c7c-a2be-32b9bcca59fb
847  308530c2ec154aa6818e71d788a58ed4  d3a9d4f6-3034-4627-8a9f-3dd814f88747
952  a45ad3ec0bee44ae8a17b966212daa40  e7cf31d1-8e16-480e-a479-49965bc3ac6f
846  defcc9db9afa4d8c808269d170c59f69  7db732d5-b1d2-4ee5-8716-11e761302fe2

    ServiceType RequestDate CompleteDate  Duration  OpsTeam  OpsHours    Tier  \
615           A  2022-01-01   2022-01-04         3        1       2.3  Tier 1
586           A  2022-01-02   2022-01-04         2        1       3.1  Tier 1
539           A  2022-01-01   2022-01-05         4        3       5.1  Tier 1
145           B  2022-01-01   2022-01-05         4        3       8.9  Tier 1
83            B  2022-01-01   2022-01-05         4        1       8.5  Tier 1
..          ...         ...          ...       ...      ...       ...     ...
897           C  2022-06-25   2022-07-03         8        3      12.0  Tier 2
955           C  2022-06-27   2022-07-03         6        1      14.9  Tier 2
847           C  2022-06-27   2022-07-04         7        3      13.2  Tier 2
952           C  2022-06-28   2022-07-05         7        3      10.2  Tier 2
846           C  2022-06-28   2022-07-05         7        3      13.7  Tier 2

     Price(\$/client)   StartDate     EndDate      Channel  Tenure(yrs)  \
615             250.0  2022-01-01  2022-03-31  Independent     6.740541
586             250.0  2022-01-01  2022-03-31  Independent    10.854447
539             250.0  2022-01-01  2022-03-31  Independent     9.360093
145             500.0  2022-01-01  2022-03-31  Independent     3.510060
83              500.0  2022-01-01  2022-03-31  Institution    14.405360
..                ...         ...         ...          ...          ...
897            1100.0  2022-04-01  9999-12-31  Institution     9.649223
```

```
955            1100.0  2022-04-01  9999-12-31  Institution     8.361103
847            1100.0  2022-04-01  9999-12-31  Independent    11.200232
952            1100.0  2022-04-01  9999-12-31  Independent    12.874037
846            1100.0  2022-04-01  9999-12-31  Independent     6.164114

    ExpenseType  Cost(\$/FTE/hr)  OpsCost    Net  RunningNet Completed_Y-M
615         Ops             50.0    115.0  135.0       135.0       2022-01
586         Ops             50.0    155.0   95.0       230.0       2022-01
539         Ops             50.0    255.0   -5.0       225.0       2022-01
145         Ops             50.0    445.0   55.0       280.0       2022-01
83          Ops             50.0    425.0   75.0       355.0       2022-01
..          …               …       …       …          …           …
897         Ops             50.0    600.0  500.0    200830.0       2022-07
955         Ops             50.0    745.0  355.0    201185.0       2022-07
847         Ops             50.0    660.0  440.0    201625.0       2022-07
952         Ops             50.0    510.0  590.0    202215.0       2022-07
846         Ops             50.0    685.0  415.0    202630.0       2022-07

[1000 rows x 20 columns]
```

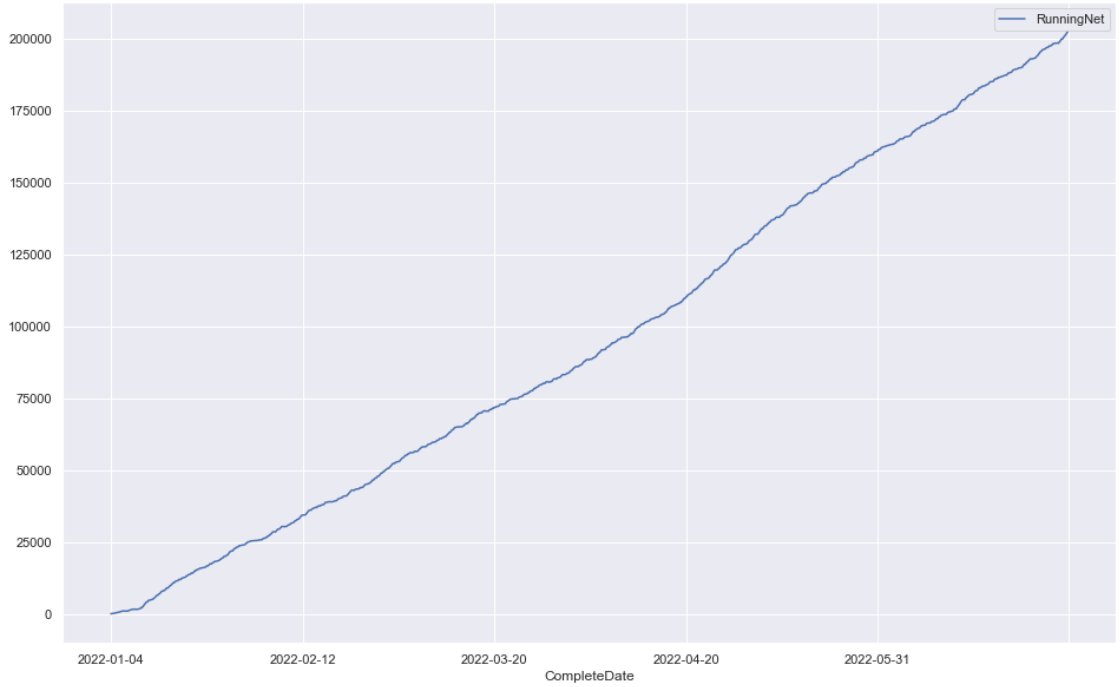
[56]: <AxesSubplot:xlabel='CompleteDate', ylabel='RunningNet'>



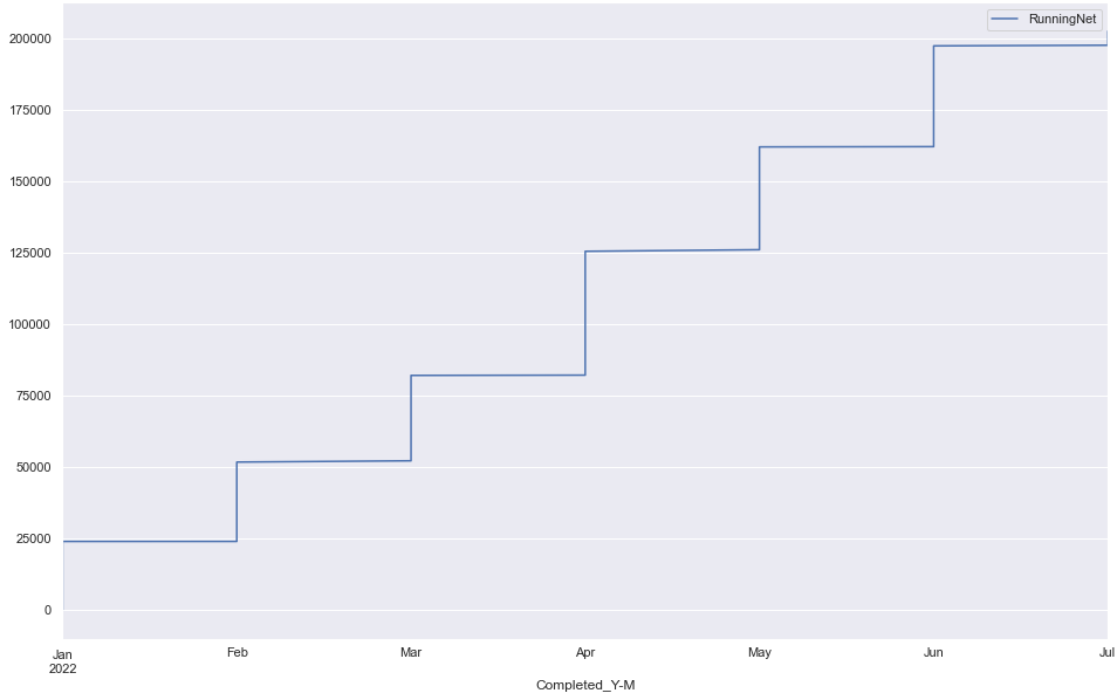
[57]: <AxesSubplot:xlabel='Completed_Y-M'>



[58]: <AxesSubplot:xlabel='CompleteDate'>

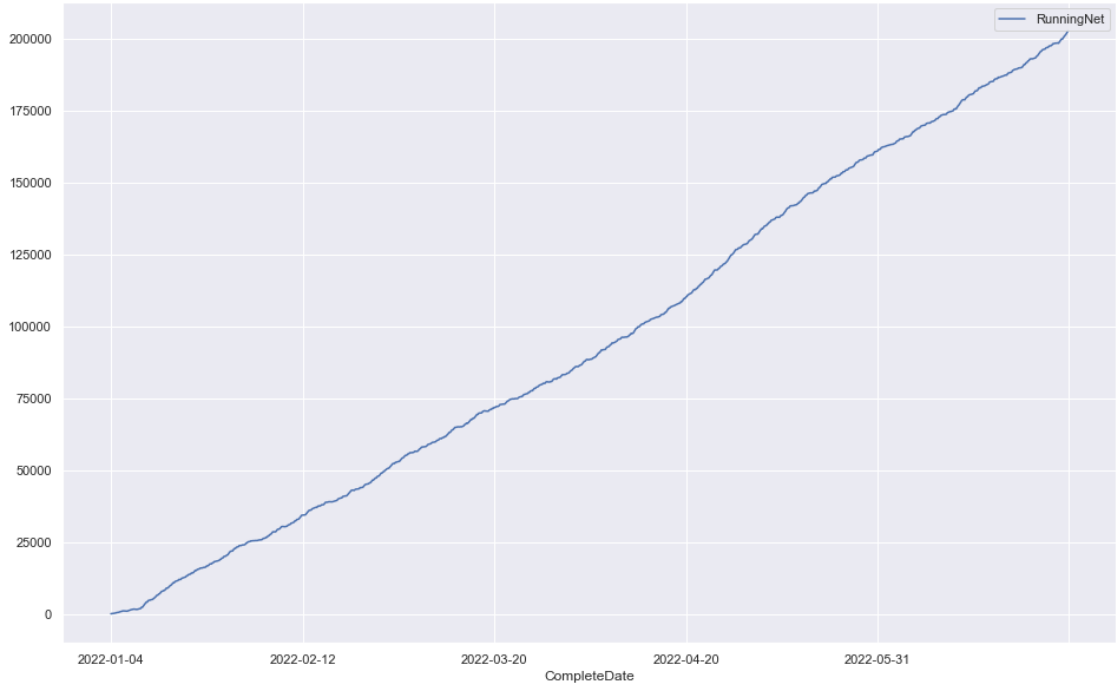


[59]: <AxesSubplot:xlabel='Completed_Y-M'>

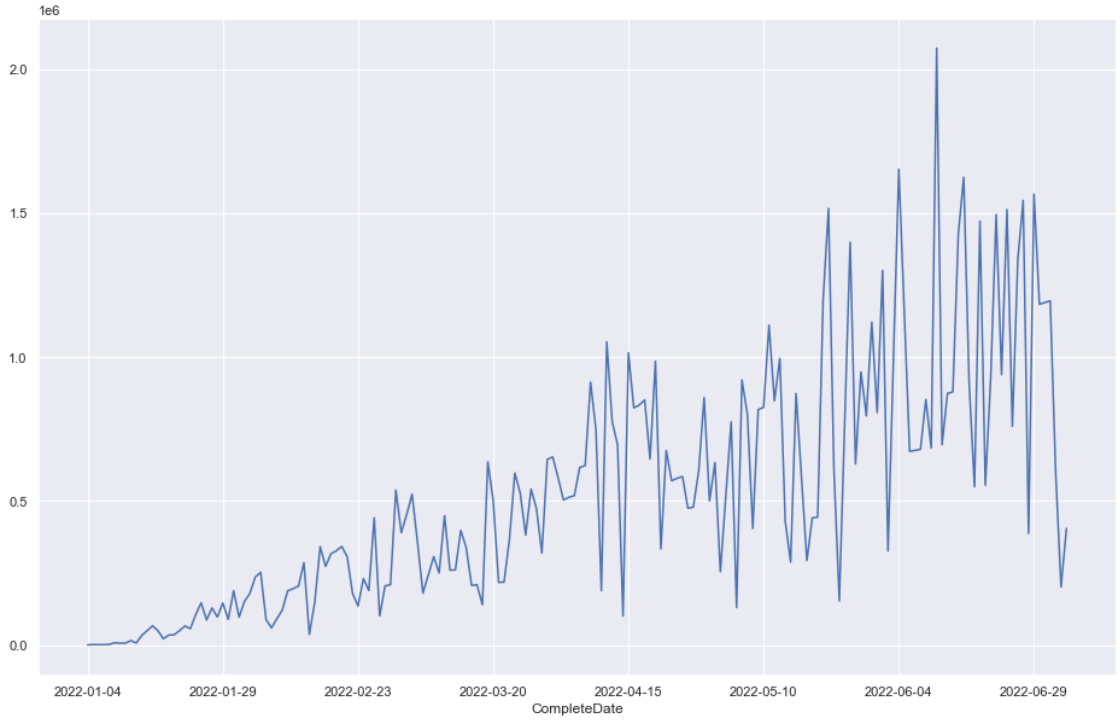


[60]: <AxesSubplot:xlabel='Completed_Y-M'>

[61]: <AxesSubplot:xlabel='CompleteDate'>

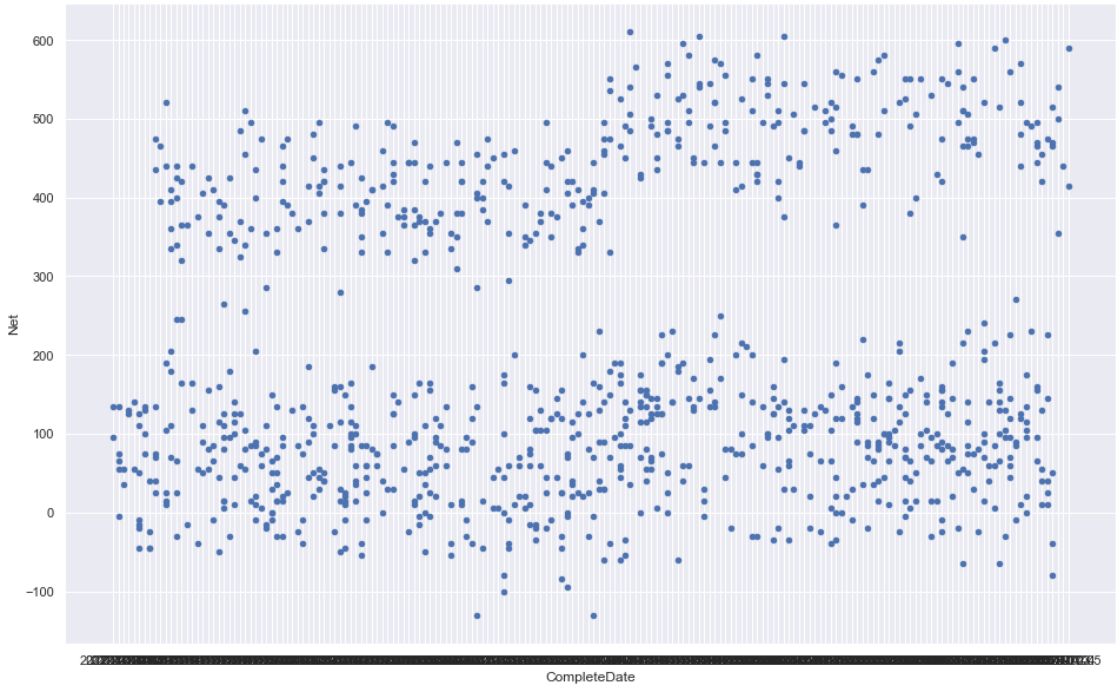


[62]: <AxesSubplot:xlabel='CompleteDate'>



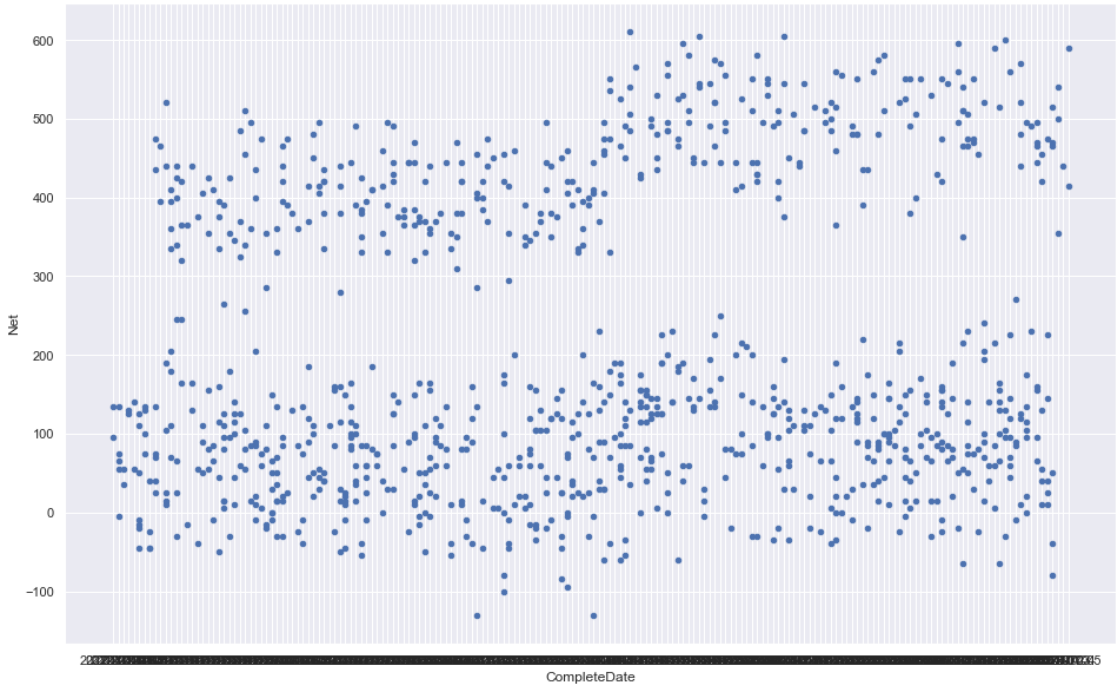

```
*c* argument looks like a single numeric RGB or RGBA sequence, which should be
avoided as value-mapping will have precedence in case its length matches with
*x* & *y*.  Please use the *color* keyword-argument or provide a 2-D array with
a single row if you intend to specify the same RGB or RGBA value for all points.
```

[63]: <AxesSubplot:xlabel='CompleteDate', ylabel='Net'>

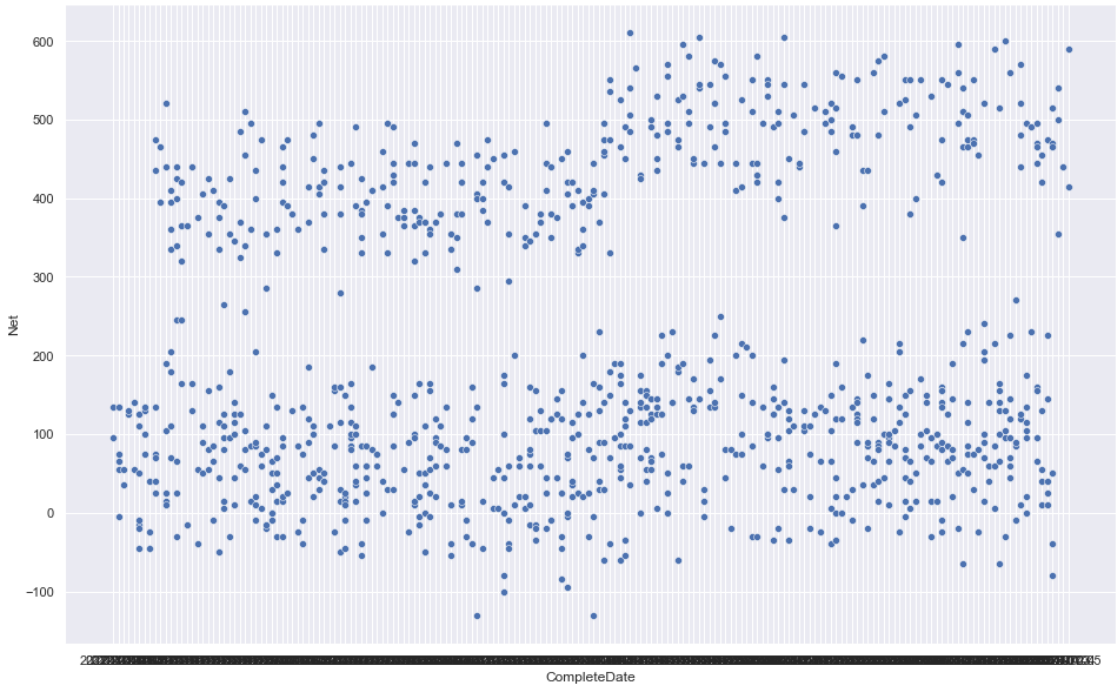



```
*c* argument looks like a single numeric RGB or RGBA sequence, which should be
avoided as value-mapping will have precedence in case its length matches with
*x* & *y*.  Please use the *color* keyword-argument or provide a 2-D array with
a single row if you intend to specify the same RGB or RGBA value for all points.
```

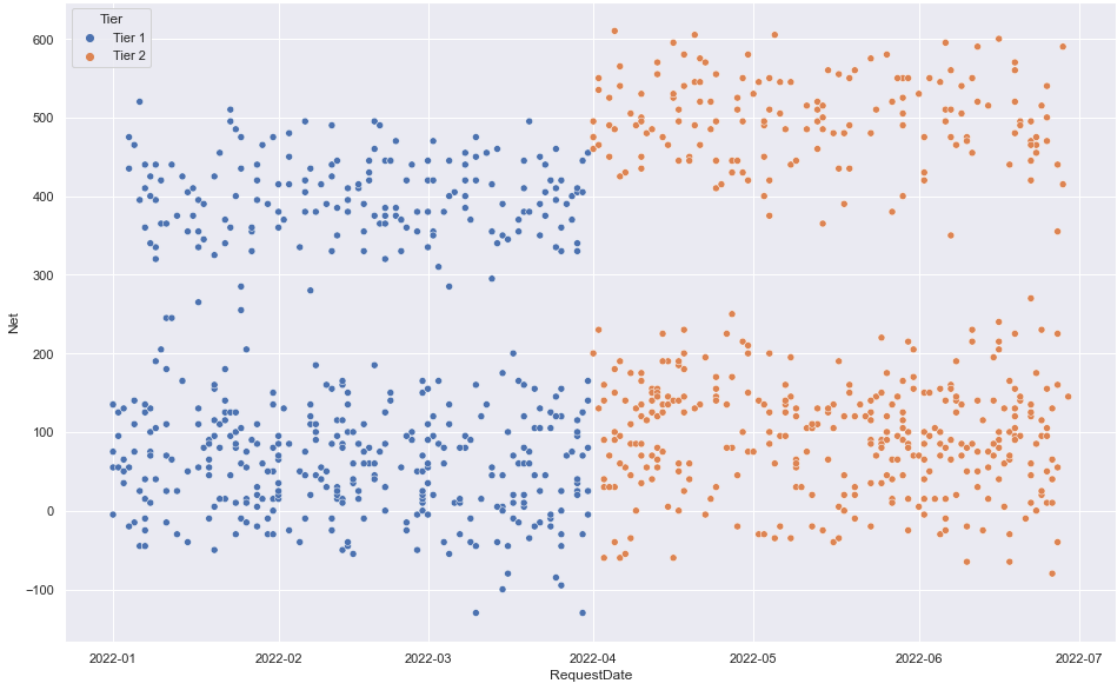
[64]: <AxesSubplot:xlabel='CompleteDate', ylabel='Net'>



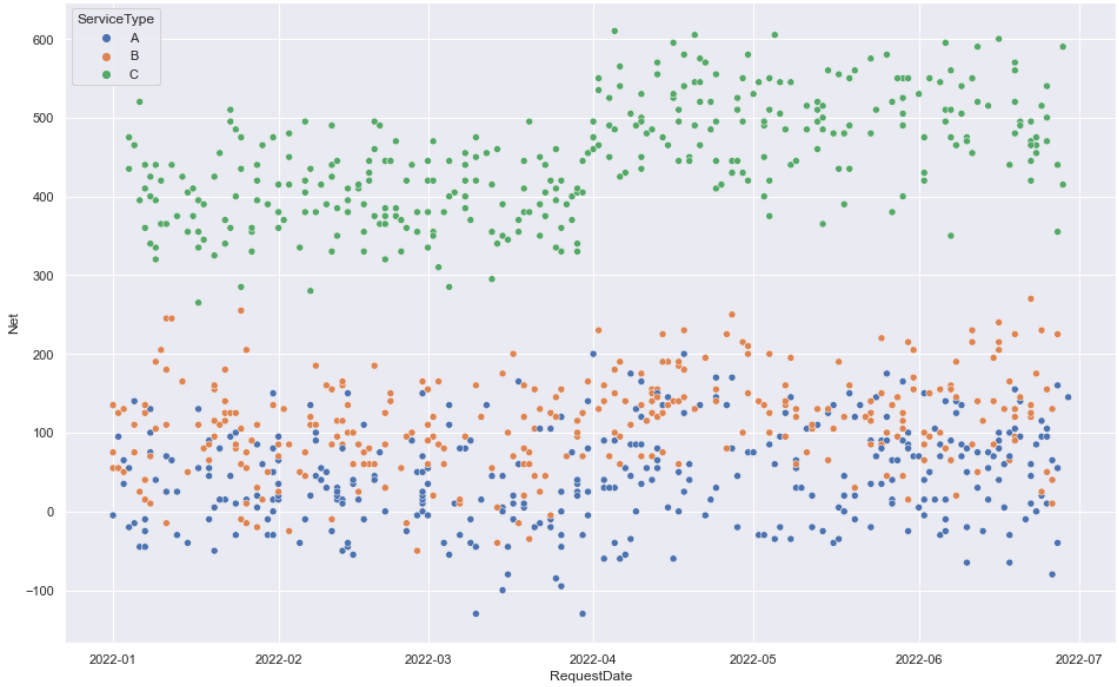
[65]: <AxesSubplot:xlabel='CompleteDate', ylabel='Net'>



[66]: <AxesSubplot:xlabel='RequestDate', ylabel='Net'>



[67]: <AxesSubplot:xlabel='RequestDate', ylabel='Net'>



```
[69]: Channel      ServiceType
      Independent  A              0.360202
                   C              0.331234
                   B              0.308564
      Institution  C              0.378641
                   B              0.315534
                   A              0.305825
      Name: ServiceType, dtype: float64

[70]: Channel
      Independent    405.806045
      Institution    422.135922
      Name: OpsCost, dtype: float64

[71]: Channel
      Independent    198.381612
      Institution    219.004854
      Name: Net, dtype: float64

[72]: Channel
      Independent    604.187657
      Institution    641.140777
      Name: Price(\$/client), dtype: float64

[73]: Channel
      Independent    8.116121
      Institution    8.442718
      Name: OpsHours, dtype: float64

     0.3416536661466459
     0.328476821192053

[75]: 202630.0

[76]: 611800.0

[77]: 0.331203007518797

[78]: Tier
      Tier 1    297750.0
      Tier 2    314050.0
      Name: Price(\$/client), dtype: float64

[79]: Tier
      Tier 1     89765.0
      Tier 2    112865.0
```

```
Name: Net, dtype: float64
```

[80]:
```
Tier
Tier 1    0.301478
Tier 2    0.359385
dtype: float64
```

[81]:
```
ServiceType
A     91800.0
B    162500.0
C    357500.0
Name: Price(\$/client), dtype: float64
```

[82]:
```
ServiceType
A     15675.0
B     34980.0
C    151975.0
Name: Net, dtype: float64
```

[83]:
```
ServiceType
A    0.170752
B    0.215262
C    0.425105
dtype: float64
```

[84]:
```
Channel
Independent    479725.0
Institution    132075.0
Name: Price(\$/client), dtype: float64
```

[85]:
```
Channel
Independent    157515.0
Institution     45115.0
Name: Net, dtype: float64
```

[86]:
```
Channel
Independent    0.328344
Institution    0.341586
dtype: float64
```

[87]:
```
0.331203007518797
```

[88]:
```
Tier
Tier 1    0.301478
Tier 2    0.359385
dtype: float64
```

[89]:
```
ServiceType
A    0.170752
B    0.215262
C    0.425105
dtype: float64
```

[90]:
```
Channel
Independent    0.328344
Institution    0.341586
dtype: float64
```

Profit Margins:

- **Overall:** 33.1%
- **Channel:**
  - Independent: 32.8%
  - Institutional: 34.2%
- **Tier:**
  - Tier 1: 30.1%
  - Tier 2: 35.9%
- **Service Type:**
  - A: 17.1%
  - B: 21.5%
  - C: 42.5%

2 Results

3 LPL Case Study

3.1 Part 1: Analytics Framework

3.1.1 Goals:

- Which metrics are critical to evaluate?
- At a high-level, what data would be required for these metrics and how might you source it?
- Are there any data sensitivities?

Imagine you're starting a new business that provides a service for Financial Advisors. Currently, some Advisors independently provide the service to their end-clients. Other Advisors do not provide the service at all since it can be time consuming and requires an investment upfront to build the necessary skillset. Your new business gives the Advisor the opportunity to outsource this service to you, saving time for Advisors previously providing the service and expanding the business proposition of those not qualified to provide it. The Advisors are your direct customers making payment to you; they also act as a liaison between you and the end-client. Advisors can subscribe to the service for a 6-month period in two ways: (1) pay as you go (pay for only what is needed at a premium cost per service) or (2) contract with minimum commitment (discounted cost per service

with total contract amount paid in equal amounts each month). You are part of your business' management team that oversees both the business itself and the team of operational staff that does the tangible service work.

Which metrics are critical to evaluate?

- Finance:
  - What is our cost to provide the service?
  - Given that we have different services / pricing levels, what is our profit margin for each service?
  - What are profits and costs for each type of subscription?
  - Do certain service levels require higher operational expenses, and should these only be offered to Advisors who are managing higher amounts?
- Usage:
  - Of the Advisors who use the service, what percentage use each type of service?
  - Of the Advisors who use the service, what percentage use each type of subscription?
  - Over time, do we see different usage levels for each type of service we offer?
  - Are we seeing a change over time in the percentage of our Advisors who use the service vs the Advisors who don't?
  - What is the average retention / churn rate for Advisors with our services vs Advisors without our services vs overall?
    - By service type?

- Clients:
  - For each service level that we offer, what percentage of end-clients are within each level, out of the clients who have Advisors that use at least one service
  - For the Advisors that switch from not using our service to using at least one service, do they see an increase in the number of clients? Is their client growth higher after starting service vs client growth prior to using the service?
  - Feedback / ratings / satisfaction among clients for each type of service offered
  - Do we see higher satisfaction rates among clients who have an Advisor that uses at least one service?
  - Conversely, do we see lower satisfcation rates among clients who have an Advisor that does not use at least one service?
  - What is the average client count for Advisors who use the service vs Advisors who don't?
    - What is the average count by service type?

At a high-level, what data would be required for these metrics and how might you source it?

- Finance:
  - expenses / profit / revenue for each type of service
    - operations / internal teams / cost of infrastructure and tools / revenue by service type
  - expenses / profit / revenue for each type of subscription
    - operations / internal teams / cost of infrastructure and tools / revenue by subscription type
  - the amount each Advisor manages

        * sourced from the Advisors
- Usage
  - what type of service does each Advisor use
    * sourced from the Advisors
  - what type of subscription does each Advisor use
    * sourced from the Advisors
  - total Advisor count
    * internal data / sourced from the Advisors

- Clients
  - count of clients by month for each service type
    * sourced from the Advisors
  - count of clients by month for each Advisor
    * sourced from the Advisors
  - client feedback
    * survey data, form on a website
  - how many clients leave each month
    * internal data or the Advisors

Are there any data sensitivities?

- Any PII related to clients should be scrubbed out, except for maybe age (but DOB should not be included)
- Advisor PII should be scrubbed from the data and only referred to by ID unless we need to communicate with them directly
- Once we determine what metrics to use, we should also determine which of those metrics can be shared with Advisors and clients and which metrics should stay internal to management

3.2 Part 2: Data Analysis

3.2.1 Goals:

- Explore the data and see what insights you can find
- Determine how best to visualize the data
- Start with a descriptive analysis of the historical data
  - What is essential to know?
  - Profitability, sales, operational efficiency & productivity… are there trends, good or bad?
- Bonus (not required) Perform a simple predictive analysis to forecast one of the metrics

3.3 TakeAways

High Level Stats:

- Personnel Costs: \$320,000
- Gain from Services Provided: \$202,630
- 99 individual Advisors, 947 individual Clients
- Advisor average tenure: 7 years
  - Independent: 6.9 years
  - Institution: 7.3 years
- On average, a request took 8.2 hours to complete over 5.2 days and required 2 team members

- The average gain per service request is ~\$203
- Average gain per Advisor: \$2047
- Each Advisor has an average of 10 clients
- 33% profit margin overall (total Net / total Price)
- First Request Date: 01-01-2022
- Last Complete Date: 07-05-2022

3.3.1 Notes and Assumptions

- two pricing tiers based on the Start Date
- assigned Tier to the request based on Request Date
- Cost = ops hours * FTE/hour (all ExpenseTypes were Ops)
- Net = Price - Cost

Tables and Breakdowns: Profit Margins:

- **Overall:** 33.1%
- **Channel:**
  - Independent: 32.8%
  - Institutional: 34.2%
- **Tier:**
  - Tier 1: 30.1%
  - Tier 2: 35.9%
- **Service Type:**
  - A: 17.1%
  - B: 21.5%
  - C: 42.5%
- Tiers:
  - Tier 1
    - Average Gain: \$178.50
    - Total Gain: \$89,765
  - Tier 2
    - Average Gain: \$227.10
    - Total Gain: \$112,865
  - Tier 2 saw a higher average gain per request due to the higher pricing scheme
- Channel:
  - Institution
    - Average Gain: \$219.00
    - Total Gain: \$45,115
  - Independent
    - Average Gain: \$198.40
    - Total Gain: \$157,515
  - Roughly 8x the number of Independent Advisors as Institutional Advisors

Net by Tier:

[106]:
```
         Average Net by Tier
Tier
Tier 1           178.459245
Tier 2           227.092555
```

[92]:
```
         Total Net by Tier
Tier
Tier 1            89765.0
Tier 2           112865.0
```

Net by Channel:

[93]:
```
              Average Net by Channel
Channel
Independent              198.381612
Institution              219.004854
```

[94]:
```
              Total Net by Channel
Channel
Independent              157515.0
Institution               45115.0
```

Net by Service Type:

[95]:
```
              Average Net by Service Type
ServiceType
A                             44.914040
B                            112.838710
C                            445.674487
```

[96]:
```
              Total Net by Service Type
ServiceType
A                             15675.0
B                             34980.0
C                            151975.0
```

Net by Tier and Service Type:

```
Average Net by Tier and Service Type
```

[97]:
```
ServiceType          A           B           C
Tier
Tier 1       29.011976   92.187500  398.693182
Tier 2       59.505495  134.866667  495.787879
```

```
Total Net by Tier and Service Type
```

[98]:
ServiceType	A	B	C
Tier			
Tier 1	4845.0	14750.0	70170.0
Tier 2	10830.0	20230.0	81805.0

Breakdown of All Transactions by Tier and Service Type:

[99]:
Tier	A	B	C
Request Breakdown by Tier and Service Type			
Tier 1	0.167	0.16	0.176
Tier 2	0.182	0.15	0.165

Operations - Average Metrics:

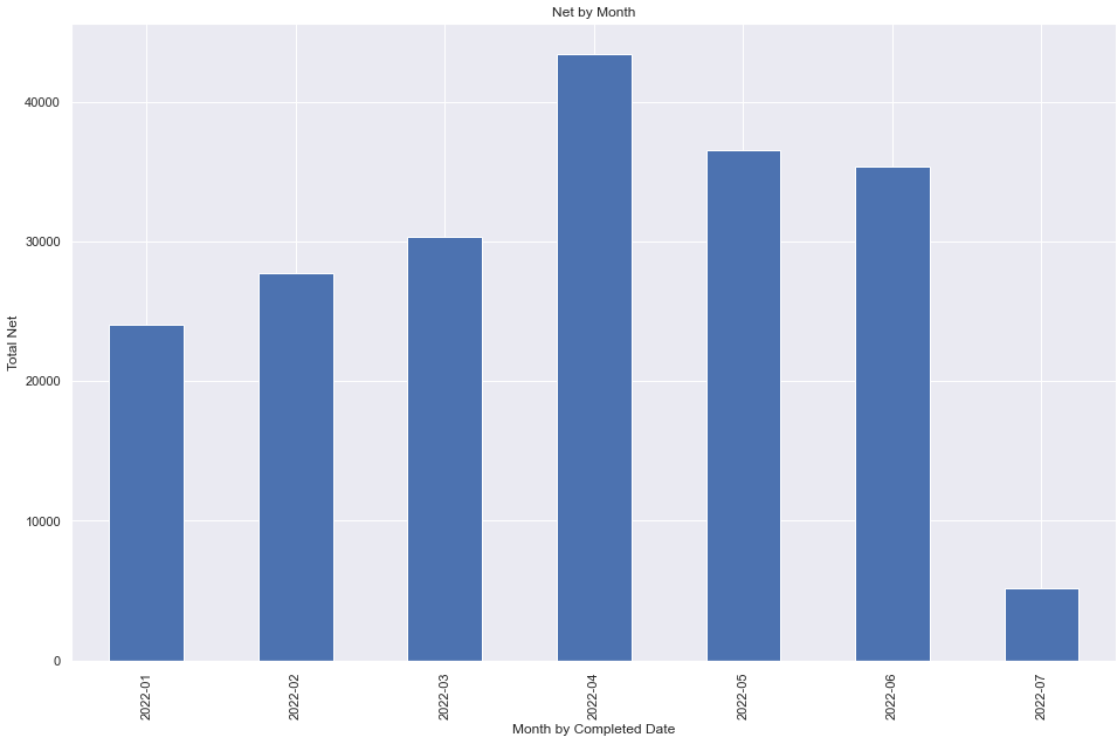
Operations Averages

[100]:
	Duration			OpsHours			\
ServiceType	A	B	C	A	B	C	
Tier							
Tier 1	3.556886	4.48125	7.443182	4.41976	8.156250	12.026136	
Tier 2	3.510989	4.54000	7.503030	4.30989	8.302667	12.084242	

	OpsTeam		
ServiceType	A	B	C
Tier			
Tier 1	1.988024	2.06875	2.028409
Tier 2	2.137363	2.06000	2.103030

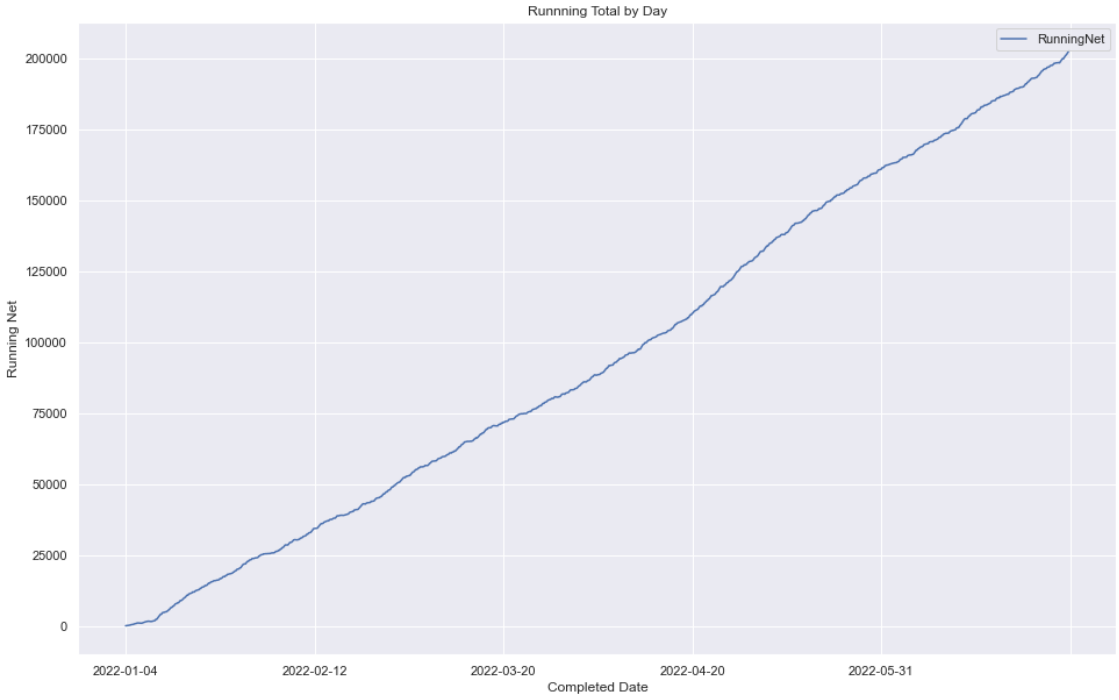
Charts: Net by Month:

AxesSubplot(0.125,0.125;0.775x0.755)



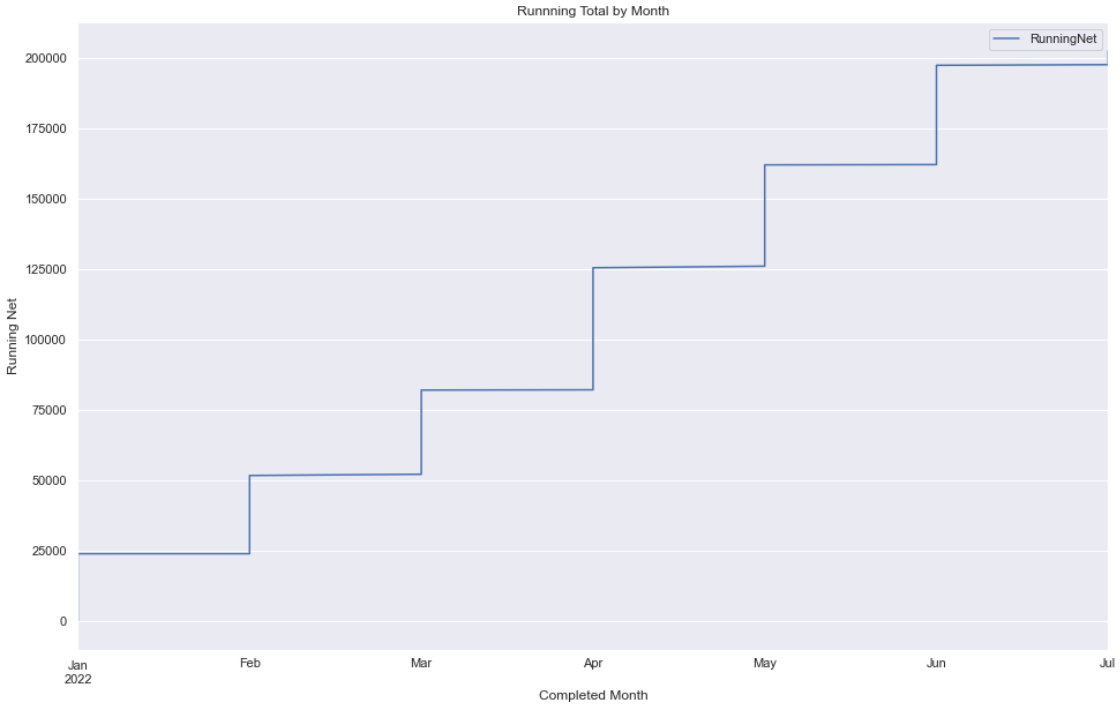
Running Total by Day:

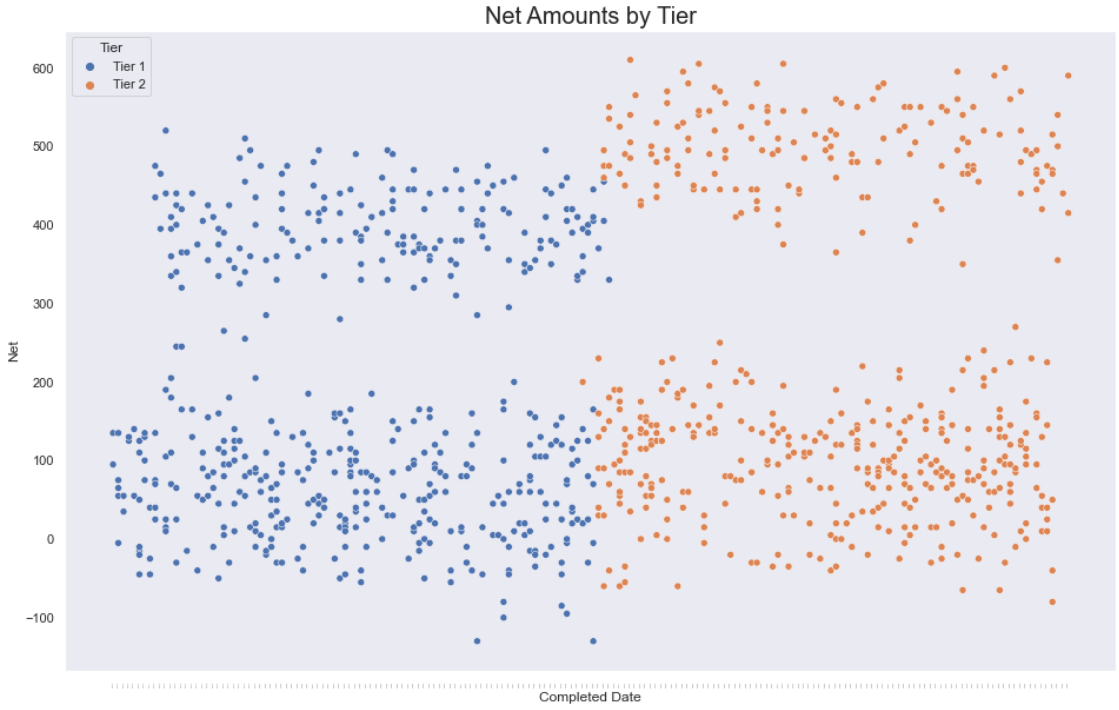
`AxesSubplot(0.125,0.125;0.775x0.755)`

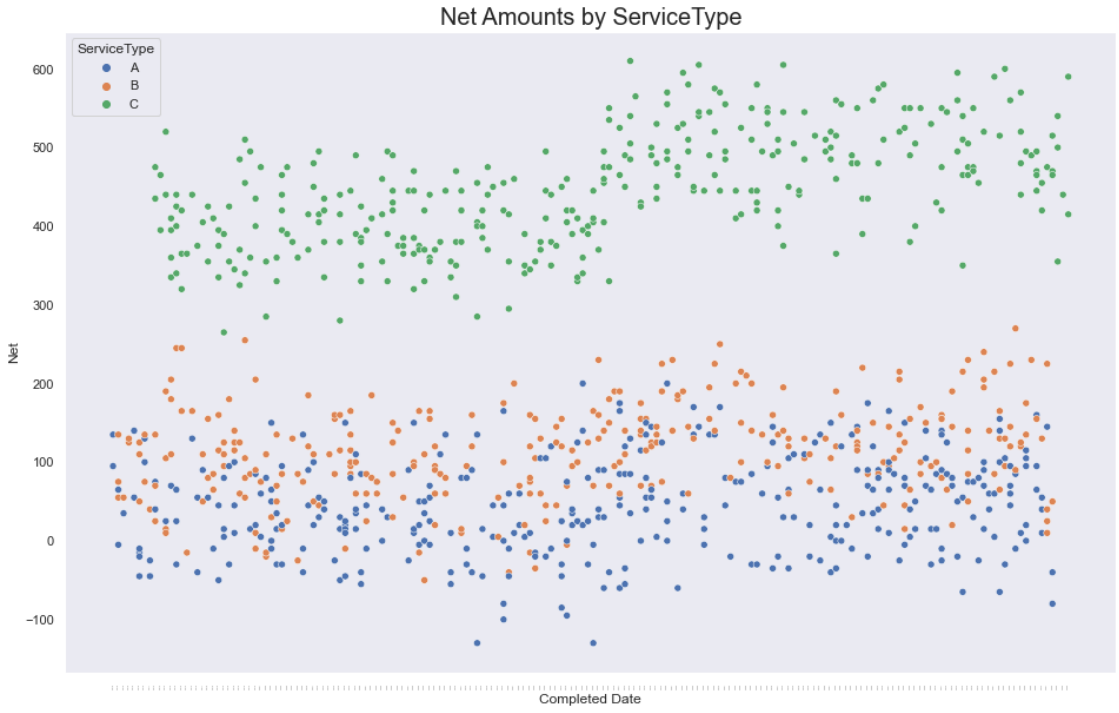


Running Total by Month:

```
AxesSubplot(0.125,0.125;0.775x0.755)
```




Net Amounts by Tier
Tier
Tier 1
Tier 2
600
500
400
300
200
100
0
−100
Net
Completed Date


Net Amounts by ServiceType
ServiceType
A
B
C
600
500
400
300
200
100
0
−100
Net
Completed Date

3.3.2 Conclusions:

- The switch to Tier 2 pricing will benefit us going forward. The higher pricing per Service Type will lead to higher revenue
- We see higher margins among Institutional Advisors and with Service C
  - This can be a focus area going forward
  - Is it possible to reduce expenses for Services A and B?
- Improving some of the Operations metrics can lead to higher margins:
  - Fewer days to implement each Request
  - Fewer hours to implement each Request
  - Fewer team members to implement each Request