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# Empowerment in Technology: Coached Self-Learning with Python, SQL, and Service Deployment in a Modern Context

Twenty Hours of Private Instruction by Jon Reznick of  
Competitive Advantage Research  
[www.compadre.us](http://www.compadre.us)



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Jon Reznick founded Competitive Advantage Research, LLC in 2013 as a business entity through which he provides information architecture, database administration, research, and analytics for business intelligence as well as full-stack web service deployment, with end-to-end support features. Jon has spoken on panels, appeared in numerous newspapers, news-magazines, and online publications, he has testified to government commissions, and he has appeared on NY1 air several times as a subject matter expert, using products he innovated from scratch to produce news-worthy insights. While Competitive Advantage Research, LLC does not disclose its clients, Jon has consulted directly with leaders in New York government, newspaper journalists and editors, union leaders, a CUNY administration, national organizations, candidates for office, and a variety of business leaders straddling numerous industries, all as a self-taught technologist.

Jon stresses that this kind of path is not a result of talent or ability—just skill and practice, and that is a philosophy that is central to this learning product. Jon distinguishes this course from other products out there because it is framed as coaching for the self-taught technologist. Jon believes that the technology, the skills, and the behaviors taught here should be accessible to anyone and that “professionalizing” in software technology requires only that we set aside certain barriers to entry and roll our sleeves up.

Though lectures focus on skill areas, this course also pushes the student into the deep end, where students answer their own questions by accessing the knowledge base directly and proving their newly acquired skills out immediately with their own real project code. At the end of this document, please find a collection of four case-studies representing Jon's own work at Competitive Advantage Research, as these will give a clear idea of how technical skills can be harnessed explicitly to solve unique challenges in settings that would not necessarily accommodate hiring a traditional full-time software developer.

Jon is a graduate of New York University where he studied Film & Television Production within the Tisch School of the Arts.



Since 2017, Jon Reznick of Competitive Advantage Research has offered individualized private tutelage and coaching to aspiring technologists who are looking to master the open-source toolkit. While multi-year degrees from institutes of higher learning, tech boot-camps, and certification programs are all valid options, many of them require substantial time commitment and financing, and are predicated on the notion that the learner will be pursuing a traditional career in software technology. Collectively, these represent clear barriers to entry whereas the main thrust of this course is to remove those barriers and make cutting-edge technological skills accessible and available to anyone who is willing to be a life-long learner.

Reznick has developed a curriculum and coaching style that empowers students to blaze their own path into the skills and capabilities that can have the greatest impact on their lives through personalized instruction that adapts to the needs and interests of the student. Most students have particular goals—whether for their workplace or personal projects—and we dive right in with a custom learning plan. Simply put, the first 4 hours (20%) of the course cover a fixed set of foundational principles outlined below; the remaining 16 hours (80%) are where the magic really happens as the individualized goals of the student determine how we traverse the road-map together.

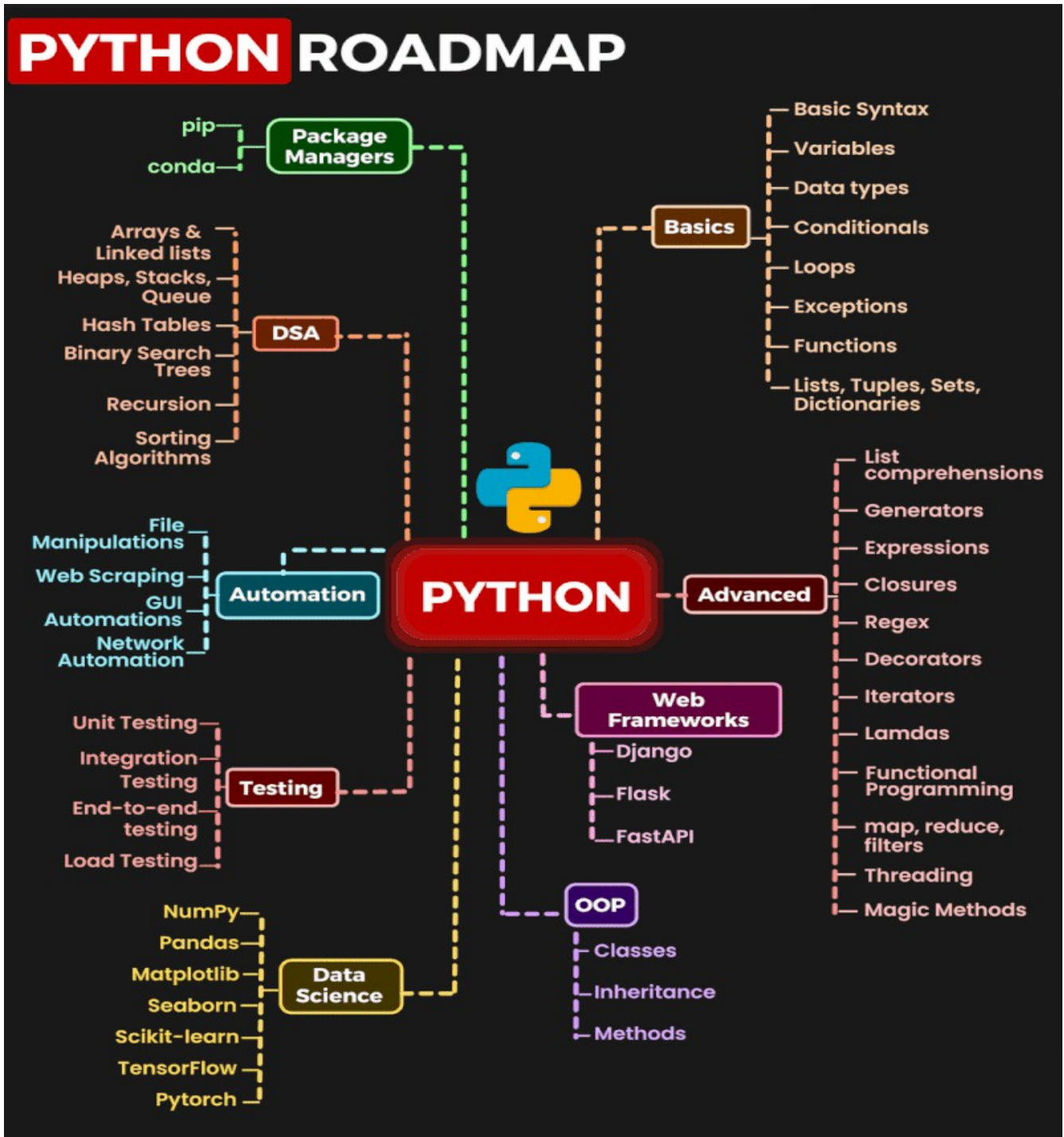
The foundational principles covered in just the first two lessons are as follows:

1. What is Python, what is software, what is a shell, what is a command line interface (CLI), what is an interpreter, what is an integrated development environment (IDE), what is Git.
2. How to face down frustration, meet it with curiosity, and confront the unknown—no mere abstraction, Reznick believes these behavioral skills are *not taught* in most learning environments and he views this as the most important skill-set in technology, even if you are not seeking a software job!
3. How to approach and comprehend the vast but structured knowledge base of open-source technology, including documentation, how-tos, quick-start guides, tutorials, community knowledge pages, and blog posts by respected tech authors.

At the completion of this foundational segment, the student will have established a local working environment (IDE), a GitHub account, and a set of practices such that they are adhering to all of the workflows, standards, and practices as everyone else in the field. This **Foundations Milestone** is critical to achieve early in the course as the refrain “You are now doing this *exactly* as every other robust software developer does it,” is oft-repeated as we proceed together, building on this familiarity of computing, behavior, and knowledge with experiential, tactile learning.



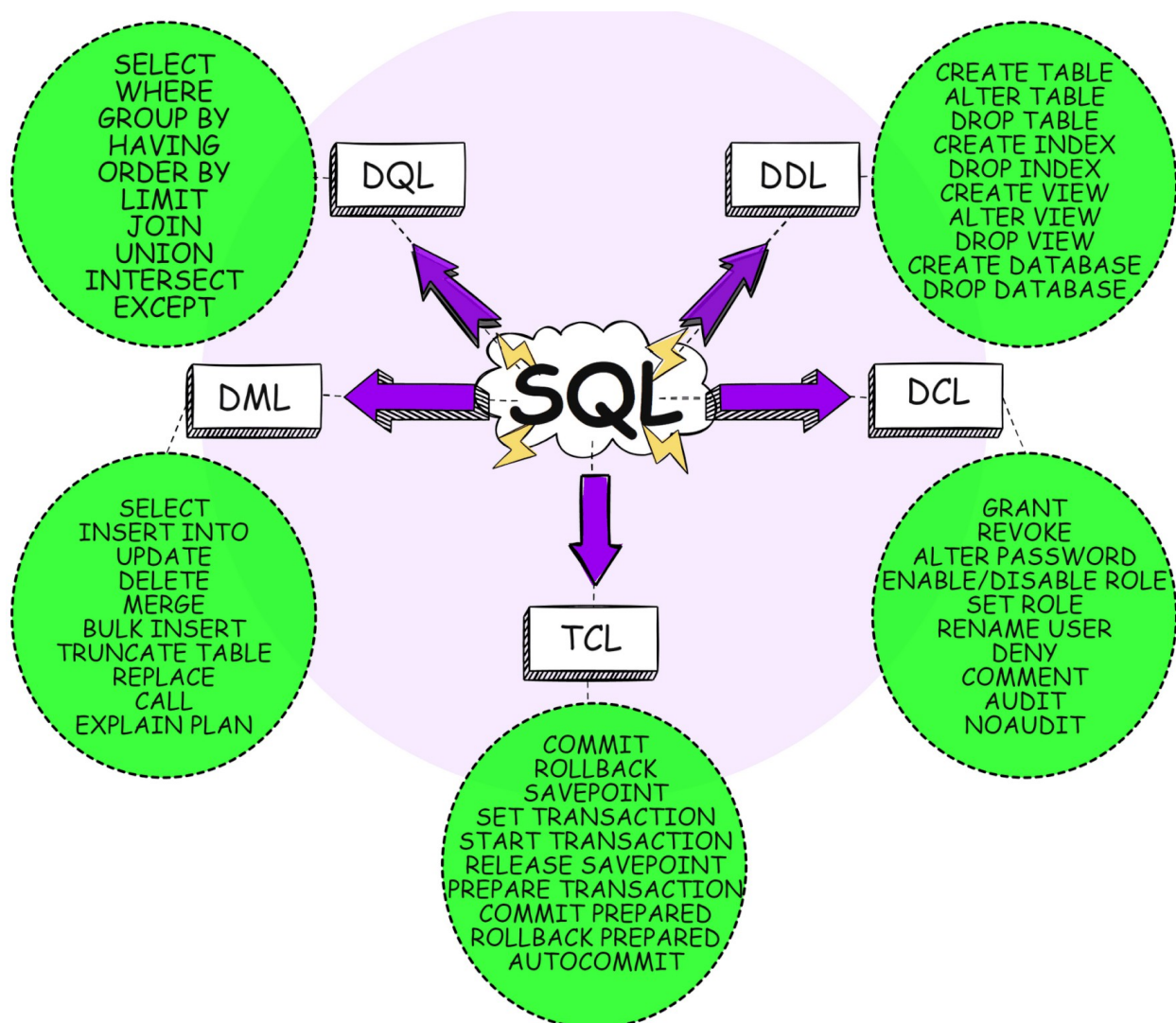
After the **Foundations Milestone** we are already talking about what kind of work the student is looking to specialize in. Software is like cooking in that the ingredients, techniques, palettes, and variation are nearly limitless. So we start with the Python Basics indicated below, and then guide the student through the rest of the road-map based on the student's priorities. In this way, the learning is centered around building a capstone project. The student is coached through the end-to-end build, enacting fully professionalized workflows and enabling professionalized “real world” experiences the whole way.





Most common databases in the world run on free software and most of this software shares a domain-specific language standard known as Structured Query Language (SQL—typically pronounced “sequel”), such that learning SQL is a tremendous and cross-applicable skill for any students pursuing data analytics in their daily lives. Although databases can be a very deep topic with tremendous specialization, SQL provides a fairly simple, uniform syntax in which five different types of statements manage complexity. Connecting Python to a database is very easy and students who wish to devote 4 hours (20%) to learning SQL will master the 5 types of SQL statement:

1. Data Query Language
2. Data Definition Language
3. Data Manipulation Language
4. Data Control Language
5. Transaction Control Language







**Intermediate software topics** to choose from among and which represent further experiential learning outside of the Python and SQL language specs but which are vital for “service deployment” in various contexts are as follows:

1. Environment and virtual environments (virtualenvs)
2. Introductory Linux administration
3. Web hosting over TCP/IP, SSL, DNS, CNAME
4. Product deployment (eg. continuous integration/continuous delivery or CI/CD)
5. Software design patterns
6. Technical security: working with code secrets, credentials, and confidential information
7. Front-end integration with HTML/CSS and JavaScript (JS)
8. API/micro-service architecture
9. Containerization with Docker

**Advanced software topics** comprise the final segment of learning and will be closely tailored to the goals of the student in completing their own project goals. Specific technical needs will in turn drive the profile of what the student is learning. Python is a language with a vast open-source library of code (known as packages or modules) that is licensed for any commercial or non-commercial use on your own terms, and with our foundational knowledge and the ability to access further knowledge, the challenges we address together will be based around the problems the student wishes to solve with technology. One student may need to host a service on the web, while another may need to crunch confidential data on their laptop. The room for variation and specialty is potentially limitless as are the ways that software can assist and extend the work of people.

At Competitive Advantage Research, I like to say that I conduct millions of person-hours of work per year, when measured by what one could do without software.

**Sample Course Plan:**

Week 1: Foundations Milestone 1 of 2

Week 2: Foundations Milestone 2 of 2

Week 3: SQL 1 of 2

Week 4: SQL 2 of 2

Week 5: Object Orientation

Week 6: Data Science tooling

Week 7: Intermediate Python concepts 1 of 2 (virtualenvs, security, design patterns)

Week 8: Intermediate Python concepts 2 of 2 (hosting, deployment, service architecture)

Week 9: Advanced Python concepts 1 of 2 (based on student's project milestone)

Week 10: Advanced Python concepts 2 of 2 (based on student's project deployment)



## PDF Text-Mining, Semantic Analysis, & Social Graphing for Discovery

*A Case Study involving civil litigation (2023)*

### **Overview:**

Party 1 initiated litigation against Party 2 in New York. Pre-trial discovery production made to Party 2 entailed roughly 100,000 document pages, delivered to Party 2 in PDF format.

### **Challenge:**

Party 1 had declined efforts to settle and was seeking a maximal conclusion against Party 2. Party 2 needed to closely examine all of the pre-trial discovery production in order to dig in and prepare for a complex trial without consuming a substantial budget on the effort.

### **Solution:**

Competitive Advantage Research, in agreement with Party 2, developed a research suite in python code. CAR converted the PDF pages into "plaintext" and started semantic analysis by frequency-counting all the Capitalized words and certain other text patterns in the plaintext corpus. CAR ran a stop-list (stop-list words are insignificant words) and quickly resolved on places, dates, and names of interest. Using this reference alongside the source documents, CAR curated the names into pertinent and non-pertinent buckets, taking additional steps to represent those pertinent names in a social graph denoting real links between persons identified in the corpus. Finally, CAR wrote a script which traversed this graph in order to procedurally draft 270 trial discovery demands emanating from the pre-trial documents in the style of requesting "...All documents and communications between {A} and {B} about {C}" where the software yielded (A,B,C) groupings via a graphing algorithm.

### **Result:**

Multiple attorneys reviewed and approved the inclusion of this complete list of demands into the moving document. All 270 demands withstood Party 1's objections, winning rulings on relevance before a New York judge. Party 2 and especially their attorney view this as a highly favorable outcome for Party 2. Six weeks later, Party 1 transmitted a settlement offer to Party 2 and it appears as if the litigation is ending on favorable terms for Party 2. CAR and its contribution to a muscular and successful answer to Party 1 is credited as one of the factors which drove this preferential outcome for Party 2.



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## Predicting an Arrest with Campaign Finance Data and Court Records

*A Case Study involving a Federal corruption trial and "The Buffalo Billion" (2015-2016)*

### **Overview:**

The Buffalo Billion, the then-Governor's signature economic development program in Western New York, had become ensnared in federal charges related to alleged bid-rigging over a project operated under the auspices of The Buffalo Billion program. The scandal reached all the way into the Governor's office; Competitive Advantage Research worked with NY1 reporter Zachary Fink on the anti-corruption angle, breaking news on the story together.

### **Challenge:**

CAR sought to identify the "political finance network" pursuing the interests of defendants in the Buffalo Billion case, using details from criminal complaints/indictments as well as a special database of campaign finance filings by every committee in New York in order to possibly detect a "political" dimension to the bid-rigging being alleged in Federal court.

### **Solution:**

CAR positively identified the directors, officers, and other named agents of defendant business entities, and used a search pool of these names and connected locations to identify the colleagues, family members/cohabitants, and key addresses pertaining to this network of individuals. Substantial payment flows were indeed discovered. In one case, a large campaign contribution was made by a developer, LP Ciminelli, via an LLC with a disjoint name, within 90 days of his firm winning a Buffalo Billion contract. By tying the LLC to him and detecting this payment, Reznick went on NY1 air with Zachary Fink in the first of two pieces and predicted the arrest of LP Ciminelli because of his involvement exposure. One year later, Reznick appeared on air to comment on Ciminelli's arrest.

### **Result:**

Piece 1: <https://spectrumlocalnews.com/nc/triad/politics/2015/09/29/cuomo-s-signature-economic-development-project-in-upstate-ny-under-federal-scrutiny>

Piece 2: <https://ny1.com/nyc/all-boroughs/politics/2016/10/3/three-people-charged-in-state-corruption-probe-return-to-court>





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## Unmasking a Cooperating Witness with Campaign Finance Data, Lobbying Data, and Court Records

*A Case Study involving the Federal corruption trial of Dean Skelos (2015)*

### **Overview:**

In June, 2015, NY Senate President Dean Skelos and his son, Adam, were charged with corruption by the US Attorney. Competitive Advantage Research worked with NY1 reporter Zachary Fink on the anti-corruption angle, breaking news on the story together.

### **Challenge:**

CAR sought to identify the "political finance network" involved in the corruption allegations being made against the senate leader and his son, again using details from criminal complaints as well as a special database of campaign finance filings.

### **Solution:**

A cooperating witness was described in the criminal complaint but not named; the detail provided in the complaint placed them in a room at an August, 2012 fundraiser together with defendant Dean Skelos, noting a donation of \$10,000 was made and a conversation took place. CAR, going to its campaign finance warehouse, identified the specific room. CAR did this by detecting "chunking" of donation records: if a fundraiser is held as a high-end live event that donors attend in person, the donations all arrive on the same day and in standardized "ticket price" amounts. These live events thus become "detectable" in the data by the distribution of transactions, and CAR was able to close in on committees linked to Skelos first, resulting in a match to an August, 2012 fundraiser that Skelos himself had chaired. After naming Anthony Bonomo, Reznick appeared with Zach Fink on NY1 to discuss.

### **Result:**

Piece 1: <https://ny1.com/nyc/all-boroughs/news/2015/07/31/bonomo-believed-to-be-at-center-of-skelos--indictment-and-his-ties-to-state-government>

Bonomo himself appeared in court to testify a few weeks later, validating CAR's work.



## Identifying the Conflicted Interests of a Top Advisor to the NYC Mayor with Campaign Finance Data and Lobbying Data

*A Case Study involving the Federal corruption trial of Sheldon "Shelly" Silver (2015)*

### **Overview:**

2015 kicked off with the spectacular January arrest of then-NYS Assembly Speaker Shelly Silver. Silver had held uniquely iron-gripped control over the Assembly super-majority of Democrats for many decades, and the rapid unscheduled disassembly of his leadership began a new political epoch and raised many immediate questions such as: who was involved? who was in trouble? who would the next Speaker be?

### **Challenge:**

CAR sought to identify the "political finance network" involved in the corruption allegations being made against the assembly leader, again using details from criminal complaints as well as a special database of campaign finance filings. Of special interest in this case was Silver's direct control of roughly a half-dozen fundraising committees, including the all-powerful Democratic Assembly Campaign Committee (DACC), which essentially brokered all election spending by Shelly's Assembly candidates.

### **Solution:**

Corresponding all of these committees into a "political finance network", CAR produced a series of data-visualizations and flow-charts and tallies regarding Silver's sprawling political finance activities. Reznick wrote a piece called "The Monopsony of Sheldon Silver" for a blog known as The Albany Project (TAP) featuring this work and describing how Shelly was the sole political buyer of Assembly Democrats and this was a central means by which he maintained control. One of these charts demonstrated a payment flow directly from Silver's own election committee to the political firm BerlinRosen when Shelly faced his 2008 contest against Paul Newell. Newell is a great friend of the firm but he did not pose a serious electoral challenge to Silver in that year and so the sheer size of the payment caught the attention of NY1 reporter Grace Rauh, a reader of TAP. This had caught her interest because BerlinRosen principal Jonathan Rosen was known to be meeting frequently and off-the-record with Mayor de Blasio, all while doing other business before the City.

### **Result:**

Piece 1: <https://ny1.com/nyc/all-boroughs/news/2015/04/1/ny1-exclusive--who-is-jonathan-rosen--the-most-powerful-man-in-politics---outside-city-hall>

Grace's team at NY1 would submit a Freedom of Information Law (FOIL) request to Mayor de Blasio about Rosen. De Blasio mounted his "agents of the city" defense in a bid to maintain secrecy on those records. Competitive Advantage Research work product on Rosen went into court briefs seeking these records. The public interest prevailed, and the Mayor's Office disgorged thousands and thousands of records. In subsequent conversation with executives at BerlinRosen, Reznick is credited with the onset of new norms for how lobbyists approach the City of New York.