

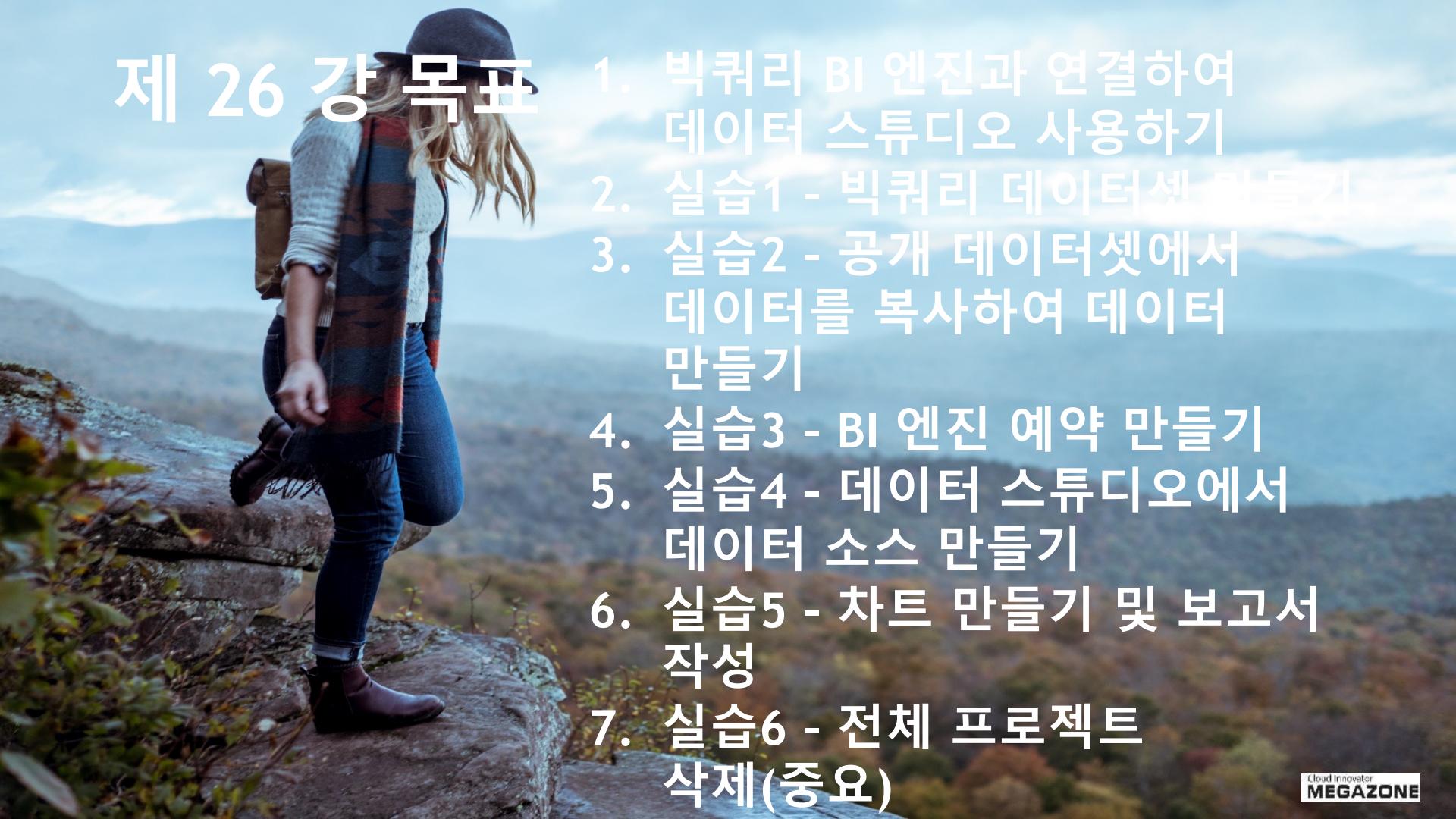
# 빅쿼리를 활용한 빅데이터 분석 (26)

서진호

자료 다운로드: <https://www.github.com/synabreu/BigQuery>



# 제 26 강 목표

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1. 빅쿼리 BI 엔진과 연결하여 데이터 스튜디오 사용하기
  2. 실습1 - 빅쿼리 데이터셋 만들기
  3. 실습2 - 공개 데이터셋에서 데이터를 복사하여 데이터 만들기
  4. 실습3 - BI 엔진 예약 만들기
  5. 실습4 - 데이터 스튜디오에서 데이터 소스 만들기
  6. 실습5 - 차트 만들기 및 보고서 작성
  7. 실습6 - 전체 프로젝트 삭제(중요)

# BigQuery BI 엔진

- 빅쿼리 BI 엔진은 신속한 인메모리 분석 서비스
- BI 엔진을 사용하면 1초 미만의 쿼리 응답 시간으로 빅쿼리에 저장된 데이터를 분석하는 동시에 컴퓨팅 비용을 절감함.
- 빅쿼리 BI 엔진 대시보드 개선 방법
  - BI Engine SQL 인터페이스 이용
  - BI Engine이 대화형 성능을 제공하는 구글 데이터 스튜디오 가속화 방법



# BigQuery BI 엔진 장점

- 유용한 정보를 도출하는 데 걸리는 시간을 단축하여 성과를 비즈니스 속도에 맞출 수 있음
- 간소화된 아키텍처를 통해 복잡한 데이터 파이프라인 또는 서버를 관리하지 않고 빠르게 시작
- BigQuery의 원활한 환경을 통해 사용 편의성 증대
- 구성 설정이 거의 없는 스마트 미세 조정



# BigQuery BI 권장 사항

- 격리
- 쿼리 복잡성
- 쿼리 최적화
- 구체화된 뷰
- 성능 비교 (BI Engine 로그 및 진단)



# 선호 테이블(Preferred table) 지정

- 다른 모든 테이블에 대한 쿼리는 일반 빅쿼리 슬롯을 사용하는 것과 달리 빅쿼리 선호 테이블 기능을 사용하면, BI 엔진 가속화를 지정된 테이블 집합으로 제한할 수 있음.
- 예를 들어, 선호 테이블을 사용하면 비즈니스에 중요한 것으로 식별된 테이블과 대시보드만 가속화할 수 있음.
- 프로젝트에 모든 선호 테이블을 보관할 수 있을 만큼 RAM이 충분하지 않은 경우, BI 엔진은 최근에 액세스하지 않은 파티션과 열을 오프로드 하는 데, 가속이 필요한 새 쿼리에 메모리를 확보함.
- 따라서 선호 테이블을 지정하려면, 구글 클라우드 콘솔 을 이용하거나, SQL의 데이터 정의 언어(DDL) 문장을 이용함.



# 실습1 – 빅쿼리 데이터셋 만들기

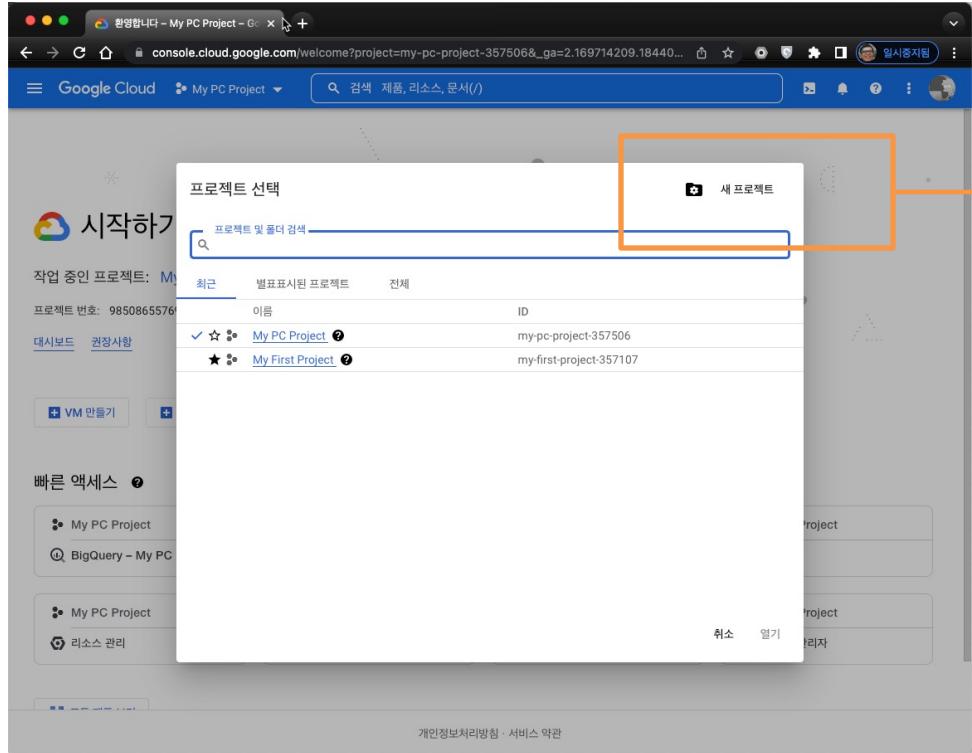


# 구글 클라우드 메인 화면

The screenshot shows the Google Cloud Platform main dashboard. At the top, there is a navigation bar with the URL `console.cloud.google.com/welcome?project=my-pc-project-357506&_ga=2.169714209.18440...`. A red box highlights the project name 'My PC Project' in the dropdown menu. Below the navigation bar, the dashboard features a decorative background with geometric shapes like triangles and circles. On the left, there is a '시작하기' (Get Started) section with a cloud icon. The main content area displays the message '작업 중인 프로젝트: My PC Project' and '프로젝트 번호: 985086557691' and '프로젝트 ID: my-pc-project-357506'. There are two tabs at the bottom of this section: '대시보드' (Dashboard) and '권장사항' (Recommendations). Below this, there are four buttons: '+ VM 만들기', '+ BigQuery에서 쿼리 실행', '+ GKE 클러스터 만들기', and '+ 스토리지 버킷 만들기'. The '빠른 액세스' (Quick Access) section contains eight cards, each with a project icon and the text 'My PC Project': 1. BigQuery - My PC Project 2. 보고서 - 결제 - My PC Project 3. 결제 - My PC Project 4. 리소스 관리 5. 프로젝트 설정 6. API 및 서비스 7. IAM 및 관리자. At the bottom of the dashboard, there is a footer with the text '개인정보처리방침 · 서비스 약관'.

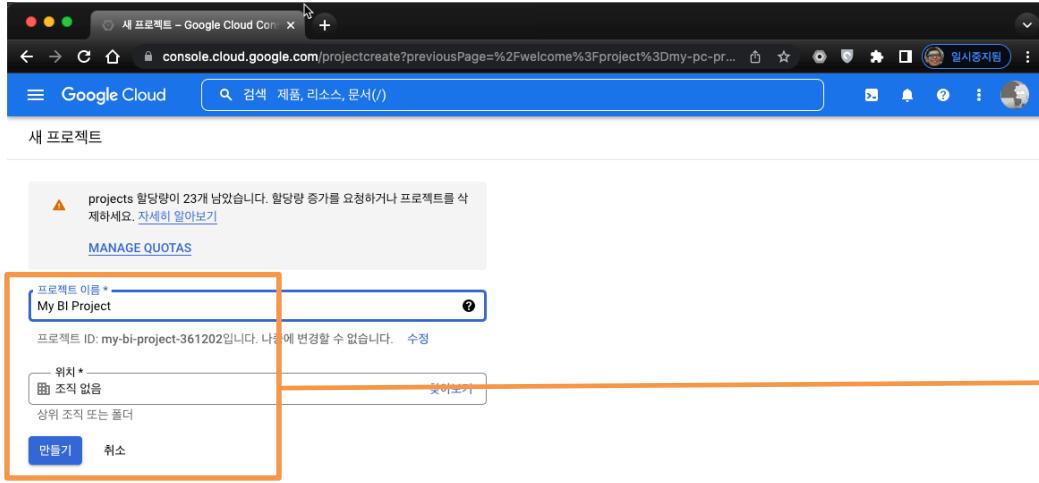
My PC Project 클릭

# 새 프로젝트 생성



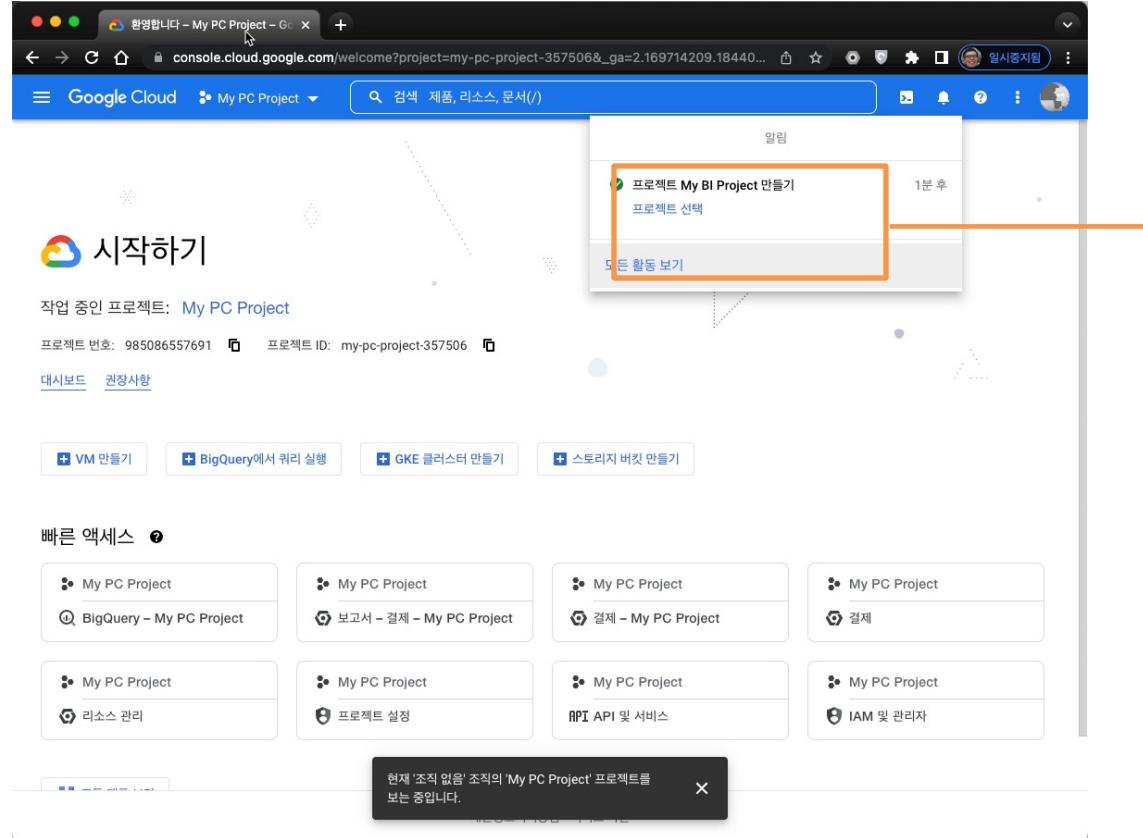
새 프로젝트 메뉴 클릭

# 새 프로젝트 입력 화면



프로젝트명: My BI Project  
위치: 조직 없음  
만들기 버튼

# 새 프로젝트 생성 완료



## 프로젝트 선택

# BigQuery API 사용 확인

The screenshot shows the Google Cloud Marketplace page for the BigQuery API. At the top, there's a navigation bar with icons for back, forward, search, and user profile. Below it, the title 'BigQuery API' and 'Google Enterprise API' are displayed, along with a brief description: 'A data platform for customers to create, manage, share and query data.' There are two buttons: '관리' (Manage) and 'API 사용해 보기' (Try API). A callout box highlights the 'API 사용 설정됨' (API usage enabled) status, which is indicated by a green checkmark icon. An orange arrow points from this highlighted area to the right side of the slide.

BigQuery API  
Google Enterprise API

A data platform for customers to create, manage, share and query data.

관리 API 사용해 보기 API 사용 설정됨

개요 문서

개요

A data platform for customers to create, manage, share and query data.

추가 세부정보

유형: SaaS & APIs  
최종 업데이트: 22. 7. 22.  
카테고리: Big data, Google Enterprise APIs  
서비스 이름: [bigquery.googleapis.com](http://bigquery.googleapis.com)

가이드 및 문서

[Learn more](#)

서비스 약관

API 사용 설정됨

# My-BI-Project 프로젝트 확인

The screenshot shows the Google Cloud BigQuery interface. The left sidebar lists projects: 'SQL 작업공간' (selected), '데이터 전송', '예약된 쿼리', and 'Analytics Hub'. The main area shows a search bar with placeholder '입력하여 검색' and a dropdown menu listing '고정된 프로젝트를 보는 중입니다.' followed by three project names: 'my-bi-project-361202' (selected), 'bigquery-public-data', and 'my-pc-project-357506'. A red box highlights the dropdown menu. At the bottom, there are tabs for '개인 기록' and '프로젝트 기록', and a button for '새로고침'.

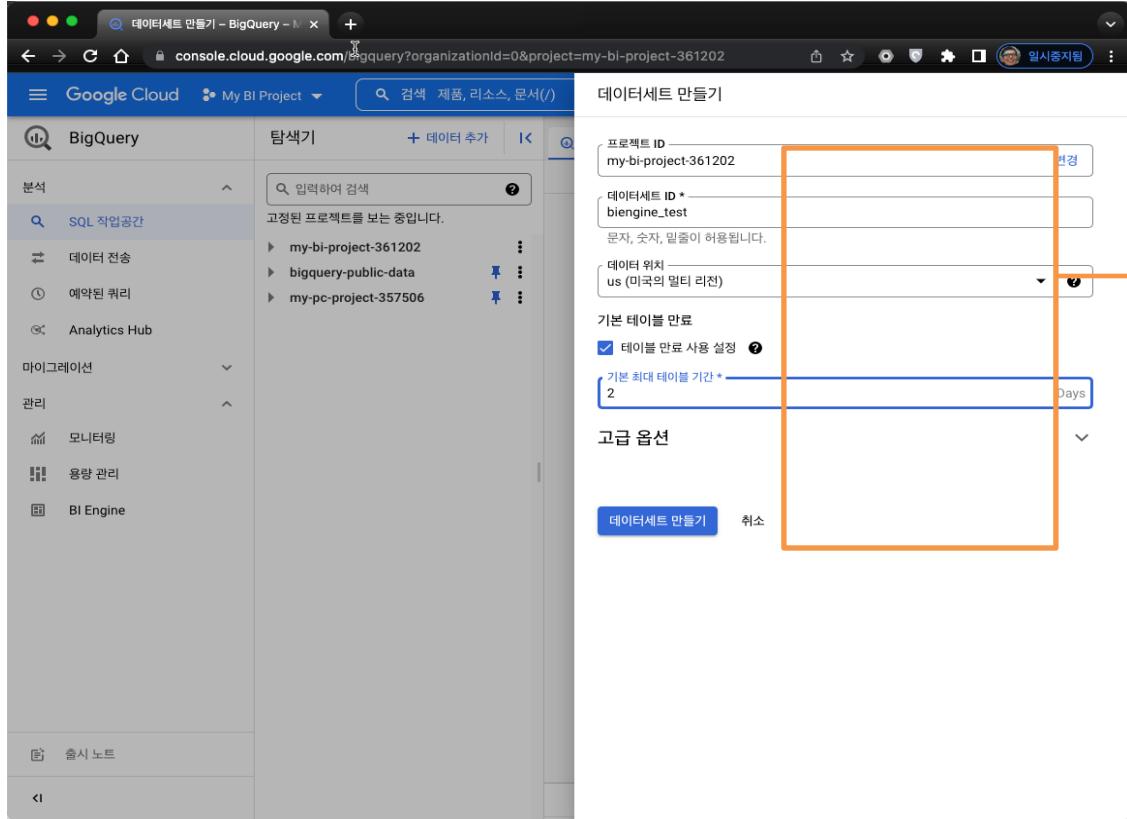
My-BI-Project 프로젝트  
확인

# 데이터셋 만들기

The screenshot shows the Google Cloud BigQuery console interface. On the left, there's a sidebar with sections like '분석' (Analytics), 'SQL 작업공간' (SQL Workspaces), '데이터 전송' (Data Transfer), '예약된 쿼리' (Scheduled Queries), and 'Analytics Hub'. The main area has a search bar at the top and a 'BigQuery' tab selected. Below it, there's a '탐색기' (Explorer) section with a tree view showing projects: 'my-bi-project-361202', 'bigquery-public-data', and 'my-pc-project-357506'. A modal window titled '데이터 세트 만들기' (Create Dataset) is open in the center, with its title also highlighted by an orange box and arrow. At the bottom of the modal, there's a note: 'Alt+F1을 눌러 접근성 옵션을 확인합니다.' (Press Alt+F1 to check accessibility options).

데이터 세트 만들기 클릭

# 데이터셋 만들기 화면



- 데이터셋 ID: biengine\_test
- 데이터 위치: us(미국의 멀티 리전)
- 기본 테이블 만료: 테이블 만료 사용 설정
- 기본 최대 테이블 기간: 2
- 데이터셋 만들기 클릭

## 실습2 – 공개 데이터셋에서 데이터를 복사하여 테이블 만들기



# 탐색기 패널 입력

The screenshot shows the Google Cloud BigQuery interface. On the left, there's a sidebar with sections like '분석', 'SQL 작업공간' (selected), '데이터 전송', '예약된 쿼리', 'Analytics Hub', 'マイグ레이션', '관리', '모니터링', '용량 관리', and 'BI Engine'. The main area has a search bar at the top with placeholder text '검색 제품, 리소스, 문서(/)'. Below it is a '탐색기' (Search) panel with a dropdown menu and a text input field containing 'san\_francisco\_311'. To the right of the search panel are buttons for '실행' (Run), '저장' (Save), '공유' (Share), '일정' (Schedule), '더보기' (More), and '시작하려면 쿼리를' (Start by running the query). At the bottom, there's a status message 'Alt+F1을 눌러 접근성 옵션을 확인합니다.' and navigation links for '개인 기록' (Personal History) and '프로젝트 기록' (Project History), along with a '새로고침' (Refresh) button.

biengine\_test  
데이터셋 생성 확인 후,  
탐색기 패널에  
san\_Francisco\_311 입력

# 탐색기 패널 테이블 검색 완료

The screenshot shows the Google Cloud BigQuery search interface. The search bar at the top contains the query 'san\_francisco\_311'. Below the search bar, the results pane displays two items:

- bigquery-public-data.san\_francisco\_311
- bigquery-public-data.san\_francisco\_311.311\_service\_requests

An orange box highlights the second item, 'bigquery-public-data.san\_francisco\_311.311\_service\_requests'. An orange arrow points from this highlighted item to the explanatory text on the right.

San\_Francisco\_311 데  
이터셋을 찾았으면, 데  
이터셋 확장 후  
311\_service\_requests  
테이블 클릭

# 테이블 스키마 미리보기 및 복사

The screenshot shows the Google Cloud BigQuery interface. On the left, the sidebar includes sections for Analysis, Monitoring, Usage, and BI Engine. The main area displays a search bar with 'san\_francisco\_311' and a results section for '311\_service\_requests'. The right side shows the detailed schema for the '311\_service\_requests' table, which contains 17 columns. A red box highlights the '복사' (Copy) button at the top right of the schema preview panel. Below the schema, there are tabs for '설정' (Settings), '액세스 정책 보기' (View Access Policy), and '개인 기록' (Personal Log).

필드 이름	유형	모드	대조
<u>unique_key</u>	INTEGER	NULLABLE	
<u>created_date</u>	TIMESTAMP	NULLABLE	
<u>closed_date</u>	TIMESTAMP	NULLABLE	
<u>resolution_action_updated_date</u>	TIMESTAMP	NULLABLE	
<u>status</u>	STRING	NULLABLE	
<u>status_notes</u>	STRING	NULLABLE	
<u>agency_name</u>	STRING	NULLABLE	
<u>category</u>	STRING	NULLABLE	
<u>complaint_type</u>	STRING	NULLABLE	
<u>descriptor</u>	STRING	NULLABLE	
<u>incident_address</u>	STRING	NULLABLE	
<u>supervisor_district</u>	INTEGER	NULLABLE	
<u>neighborhood</u>	STRING	NULLABLE	
<u>location</u>	STRING	NULLABLE	
<u>source</u>	STRING	NULLABLE	
<u>media_url</u>	STRING	NULLABLE	

테이블 스키마 및 미리  
보기 한 후, 복사 버튼  
클릭

# 테이블 복사

The screenshot shows the Google Cloud BigQuery Table Copy interface. On the left, the sidebar lists 'BigQuery' under '분석' (Analytics), 'SQL 작업 공간' (SQL Workspaces), '데이터 전송' (Data Transfer), '예약된 뷰리' (Scheduled Views), and 'Analytics Hub'. The main area is titled '테이블 복사' (Table Copy) and shows the following fields:

- 소스**:
  - 프로젝트 이름: san\_francisco\_311
  - 데이터셋: bqquery-public-data
  - 테이블 이름: 311\_service\_requests
- 대상 위치**:
  - 프로젝트 \*: my-bi-project-361202 (highlighted with an orange box)
  - 데이터셋 \*: biengine\_test
  - 테이블 \*: 311\_service\_requests\_copy (highlighted with an orange box)
- 고급 옵션**:
  - 주의: 코드 문자 표시, 수자, 워너터 대시, 고백이 필요합니다. 이 작업은 필요한 경우 지정된 대상 테이블을 만듭니다.

At the bottom, there are '복사' (Copy) and '닫기' (Close) buttons.

데이터세트: biengine\_test  
테이블:  
311\_service\_requests\_copy

# 테이블 복사 확인 및 복사한 테이블 이동

The screenshot shows the Google Cloud BigQuery interface. On the left, the sidebar includes sections for 분석, SQL 작업공간, 데이터 전송, 예약된 쿼리, Analytics Hub, 마이그레이션, 관리, 모니터링, 용량 관리, and BI Engine. The main area shows a search bar with the query "san\_francisco\_311". Below it, a list of datasets and tables is displayed, with "311\_service\_requests" being selected. To the right, the table schema for "311\_service\_requests" is shown, listing columns like unique\_key, created\_date, closed\_date, resolution\_action\_updated\_date, status, status\_notes, agency\_name, category, complaint\_type, descriptor, incident\_address, supervisor\_district, neighborhood, location, and source. A modal window at the bottom indicates that the table "311\_service\_requests\_copy" has been successfully copied. An orange arrow points from this modal to the text "테이블로 이동" (Move to Table) on the right.

테이블을  
"311\_service\_requests\_copy"  
에 복사했습니다.

테이블로 이동 X 보기

311\_service\_requests\_copy

311\_service\_requests

필드 이름	유형	모드	대조
unique_key	INTEGER	NULLABLE	
created_date	TIMESTAMP	NULLABLE	
closed_date	TIMESTAMP	NULLABLE	
resolution_action_updated_date	TIMESTAMP	NULLABLE	
status	STRING	NULLABLE	
status_notes	STRING	NULLABLE	
agency_name	STRING	NULLABLE	
category	STRING	NULLABLE	
complaint_type	STRING	NULLABLE	
descriptor	STRING	NULLABLE	
incident_address	STRING	NULLABLE	
supervisor_district	INTEGER	NULLABLE	
neighborhood	STRING	NULLABLE	
location	STRING	NULLABLE	
source	STRING	NULLABLE	

테이블로 이동

# 복사한 테이블 스키마 및 미리보기

The screenshot shows the Google Cloud BigQuery interface. On the left, the sidebar includes sections for Analytics Hub, MyBigray, Monitoring, and Logging. The main area displays the schema of the table '311\_service\_requests' under the dataset 'san\_francisco\_311'. The schema consists of 17 columns:

필드 이름	유형	모드	데프
<a href="#">unique_key</a>	INTEGER	NULLABLE	
<a href="#">created_date</a>	TIMESTAMP	NULLABLE	
<a href="#">closed_date</a>	TIMESTAMP	NULLABLE	
<a href="#">resolution_action_updated_date</a>	TIMESTAMP	NULLABLE	
<a href="#">status</a>	STRING	NULLABLE	
<a href="#">status_notes</a>	STRING	NULLABLE	
<a href="#">agency_name</a>	STRING	NULLABLE	
<a href="#">category</a>	STRING	NULLABLE	
<a href="#">complaint_type</a>	STRING	NULLABLE	
<a href="#">descriptor</a>	STRING	NULLABLE	
<a href="#">incident_address</a>	STRING	NULLABLE	
<a href="#">supervisor_district</a>	INTEGER	NULLABLE	
<a href="#">neighborhood</a>	STRING	NULLABLE	
<a href="#">location</a>	STRING	NULLABLE	
<a href="#">source</a>	STRING	NULLABLE	
<a href="#">media_url</a>	STRING	NULLABLE	

At the bottom, there are buttons for '스키마 수정' (Schema Update) and '행 엑세스 정책 보기' (View Row Access Policy). The status bar at the bottom indicates '개인 기록' (Personal Log) and '프로젝트 기록' (Project Log).

The screenshot shows the Google Cloud BigQuery interface with the preview of the table '311\_service\_requests'. The table has 17 columns: unique\_key, created\_date, closed\_date, resolution\_action\_updated\_date, status, status\_notes, agency\_name, category, complaint\_type, descriptor, incident\_address, supervisor\_district, neighborhood, location, source, media\_url, and res. The preview shows 15 rows of data.

행	unique_key	created_date	closed_date	res
1	514881	2009-09-30 12:02:06 UTC	2009-10-27 19:26:50 UTC	2009-10-27 19:26:50 UTC
2	888950	2011-05-26 14:32:37 UTC	2011-05-27 15:10:26 UTC	2011-05-27 15:10:26 UTC
3	2208868	2013-04-05 08:08:18 UTC	2013-04-05 08:19:52 UTC	2013-04-05 08:19:52 UTC
4	557083	2009-12-04 13:32:28 UTC	2009-12-10 14:16:31 UTC	2009-12-10 14:16:31 UTC
5	415966	2009-04-21 11:47:33 UTC	2009-04-23 10:10:37 UTC	2009-04-23 10:10:37 UTC
6	9812140	2018-11-15 10:39:00 UTC	2018-11-20 12:06:47 UTC	2018-11-20 12:06:47 UTC
7	4721685	2015-05-05 16:29:36 UTC	2015-07-30 08:18:50 UTC	2015-07-30 08:18:50 UTC
8	8917813	2018-04-25 11:46:00 UTC	2018-06-25 20:30:59 UTC	2018-06-25 20:30:59 UTC
9	576289	2010-01-07 03:14:12 UTC	2010-01-11 15:07:36 UTC	2010-01-11 15:07:36 UTC
10	721996	2010-08-28 16:07:09 UTC	2010-09-01 14:15:46 UTC	2010-09-01 14:15:46 UTC
11	1451234	2012-09-20 16:52:38 UTC	2012-09-21 15:25:01 UTC	2012-09-21 15:25:01 UTC
12	3605200	2014-05-02 07:26:12 UTC	2014-05-07 08:10:40 UTC	2014-05-07 08:10:40 UTC
13	1067716	2012-02-19 02:50:48 UTC	2012-02-21 12:08:16 UTC	2012-02-21 12:08:16 UTC
14	15544656	2022-07-07 18:47:00 UTC	2022-07-11 12:27:25 UTC	2022-07-11 12:27:25 UTC
15	2111953	2013-03-10 19:35:02 UTC	2015-05-06 21:23:01 UTC	2015-05-06 21:23:01 UTC

At the bottom, there are buttons for '출시 노트' (Release Notes), '개인 기록' (Personal Log), and '프로젝트 기록' (Project Log). The status bar at the bottom indicates '개인 기록' (Personal Log) and '프로젝트 기록' (Project Log).

## 실습3 – BI Engine 예약 만들기



# BI Engine 실행하기

The screenshot shows the Google Cloud BigQuery console interface. On the left, there's a sidebar with sections like 'BigQuery', '분석' (Analytics), 'SQL 작업공간' (SQL Workspaces), '데이터 전송' (Data Transfer), '예약된 쿼리' (Scheduled Queries), and 'Analytics Hub'. A large orange box highlights the 'BI Engine' section. An orange arrow points from this highlighted area towards the right side of the screen. The main workspace on the right has a search bar at the top, followed by a toolbar with buttons for '실행' (Run), '저장' (Save), '공유' (Share), '일정' (Schedule), '더보기' (More), and '시작하려면 쿼리를' (Start by selecting a query). Below the toolbar, there's a message: '2 results 개를 찾았습니다. 검색 범위를 모든 프로젝트로 넓히기' (2 results found. Expand search range to all projects). The bottom of the screen features a navigation bar with links for '개인 기록' (Personal History), '프로젝트 기록' (Project History), and a '새로고침' (Refresh) button.

BI Engine 클릭

# BigQuery Reservation API 사용

The screenshot shows a web browser window with the title 'BigQuery Reservation API - Marketplace'. The URL is 'console.cloud.google.com/marketplace/product/google/bigqueryreservation.googleapis.com?ref=...'. The page header includes 'Google Cloud' and 'My BI Project'. Below the header, there's a back arrow and a circular profile picture.

The main content area is titled 'BigQuery Reservation API' and is described as a 'Google Enterprise API'. It states: 'A service to modify your BigQuery flat-rate reservations.' Below this, there are two buttons: a blue '사용' (Use) button and a white 'API 사용해 보기' (View API usage) button. An orange arrow points from the '사용' button to the text '사용 클릭' (Click to use).

Below the buttons, there are tabs for '개요' (Overview) and '문서' (Documentation), with '개요' being the active tab. The '개요' section contains a brief description of the service and its purpose. To the right of the overview, there's a '추가 세부정보' (Additional details) section with links to '유형: SaaS & APIs', '최종 업데이트: 22. 7. 22.', '카테고리: Google Enterprise APIs', and '서비스 이름: bigqueryreservation.googleapis.com'.

At the bottom left, there's a '가이드 및 문서' (Guide and documentation) section with a 'Learn more' link. At the bottom right, there's a '서비스 약관' (Service terms) section.

# 예약 만들기

The screenshot shows the Google Cloud BigQuery BI Engine console interface. On the left, there's a sidebar with various options like '분석' (Analytics), 'SQL 작업공간' (SQL Job Space), '데이터 전송' (Data Transfer), '예약된 쿼리' (Scheduled Queries), and 'Analytics Hub'. The 'BI Engine' option is selected and highlighted in blue. At the top, there's a search bar with the placeholder '검색 제품, 리소스, 문서(/)' and a dropdown menu with the option '+ 예약 만들기'. An orange arrow points from the right side of the image to this dropdown menu, indicating the step to click it.

예약 만들기 클릭

# 예약 만들기(1) - 구성

The screenshot shows the Google Cloud BigQuery BI Engine setup interface. On the left, a sidebar lists '분석' (Analytics), 'SQL 작업공간' (SQL Workspaces), '데이터 전송' (Data Transfer), '예약된 쿼리' (Scheduled Queries), and 'Analytics Hub'. Under 'マイグ레이션' (Migration), there are '관리' (Management), '모니터링' (Monitoring), '용량 관리' (Capacity Management), and 'BI Engine'. The 'BI Engine' option is selected and highlighted with a blue background.

**1 구성** (Step 1: Configuration): This section shows the configuration for the BI Engine. It includes a summary table with the following data:

월 \$60.72 예상
총 용량 2GB
요율 \$0.0416/GB/시간 (\$30.36/GB/월)
예약 비용 \$60.72/월

Below the table, it says 'BI Engine 예약이 현재 프로젝트에 할당됩니다.' (BI Engine reservation is assigned to the current project). A dropdown menu shows '프로젝트 My BI Project'. A red box highlights the '위치\*' (Location\*) dropdown set to 'US (미국의 멀티 리전)' (US (Multi-Region)). Another red box highlights the '용량(GB)' (Capacity (GB)) input field showing '2'.

**2 선호 테이블(선택사항)** (Step 2: Preferred Tables (Optional))

**3 확인 및 제출** (Step 3: Review and Submit)

**다음** (Next) button

- 위치: US (미국의 멀티 비전)
- 용량: 2 (GB)
- 다음 클릭

# 예약 만들기(2) - 선호 테이블

The screenshot shows the Google Cloud BigQuery BI Engine setup interface. On the left, a sidebar lists categories: 분석 (Analytics), SQL 작업공간 (SQL Workspaces), 데이터 전송 (Data Transfer), 예약된 쿼리 (Scheduled Queries), Analytics Hub, 마이그레이션 (Migration), 관리 (Management), 모니터링 (Monitoring), 용량 관리 (Storage Management), and BI Engine (selected). The main content area has a title '예약 만들기' (Create Reservation) and a sub-section '선호 테이블(선택사항)' (Optional: Preferred Table). It includes a description of BI Engine, usage information (estimated monthly cost \$60.72), and a table showing consumption, rates, and estimated costs. A large orange arrow points from the '다음' (Next) button at the bottom left to the word '다음' (Next) at the bottom right.

BI Engine은 빠른 속도를 구현하는 메모리 내 분석 서비스로, 사용자가 BigQuery 내에서 복잡한 데이터 세트를 양방향으로 탐색할 수 있도록 지원합니다. BI Engine은 Looker, 데이터 스튜디오, 연결된 시트 등의 BI 도구 또는 BI Engine에 연결되는 서드 파티 도구를 기본적으로 통합합니다. 구성이 필요하지 않습니다. 우리가 실행 중인 프로젝트에서 아래의 BI 용량을 선택하기만 하면 됩니다. 또한 이 [앞스](#)를 작성하여 BI Engine 용량을 주문형으로 늘릴 수도 있습니다.

월 \$60.72 예상

총 용량	2GB
요율	\$0.0416/GB/시간 (\$30.36/GB/월)
예약 비용	\$60.72/월

② 선호 테이블(선택사항)

BI Engine에서 가속화할 테이블을 선택하세요. 이 설정은 선택사항입니다. 테이블을 선택하지 않으면 프로젝트 내의 모든 쿼리가 BI Engine을 사용합니다.

선호 테이블

테이블 ID(project\_name.dataset\_name.table\_name)

다음

③ 확인 및 제출

다음

# 예약 만들기(3) - 확인 및 제출

예약 만들기 – BigQuery – My BI Project

Google Cloud My BI Project 검색 제품, 리소스, 문서(/)

**BigQuery**

분석

- SQL 작업공간
- 데이터 전송
- 예약된 쿼리

마이그레이션

관리

- 모니터링
- 용량 관리
- BI Engine**

예약 만들기

BI Engine은 빠른 속도를 구현하는 메모리 내 분석 서비스로, 사용자가 BI Engine 내에서 복잡한 데이터 세트를 양방향으로 탐색할 수 있도록 지원합니다. BI Engine은 Looker, 데이터 스튜디오, 연결된 시트 등의 BI 도구 또는 BI Engine에 연결되는 서드 파티 도구를 기본적으로 통합합니다. 구성이 필요하지 않습니다. 우리가 실행 중인 프로젝트에서 아래의 BI 용량을 선택하기만 하면 됩니다. 또한 이 [양식](#)을 작성하여 BI Engine 용량을 주문형으로 늘릴 수도 있습니다.

비용

월 \$60.72 예상

총 용량	2GB
요율	\$0.0416/GB/시간 (\$30.36/GB/월)
예약 비용	\$60.72/월

▲ 세부정보 숨기기

**구성**

**선행 테이블(선택사항)**

**3 확인 및 제출**

오른쪽에 설명된 시간 단위 요금을 기준으로 BI Engine 용량의 요금을 결제하는 데 동의합니다. 사용량에 관계없이 예약 크기 및 생성된 시간을 기준으로 요금이 청구됩니다. 예를 들어 0.5개월 예약을 생성하면 오른쪽에 설명된 월별 요금의 반이 청구됩니다. 1일 예약을 생성하면 시간 단위 요금에 시간을 곱한 금액이 청구됩니다. 10분 예약을 생성하면 1시간 사용 요금이 청구됩니다. [자세히 알아보기](#)

계속 진행하기 전에 [Google Cloud Platform 서비스 약관](#)을 검토하세요.

**만들기** 취:

만들기 클릭

# 예약 세부 정보

The screenshot shows the Google Cloud Platform interface for managing BI Engine reservations. On the left, there's a sidebar with sections like '분석' (Analytics), 'SQL 작업공간' (SQL Workload Space), '데이터 전송' (Data Transfer), '예약된 쿼리' (Reserved Queries), and 'Analytics Hub'. The 'BI Engine' section is highlighted. The main area is titled '예약' (Reservation) and displays a table with one row of data. The table has columns: '프로젝트' (Project), '크기' (Size), '선행 테이블' (Preceding Table), '위치' (Location), '월간 비용' (Monthly Cost), and '작업' (Operations). The data in the table is: Project ID 154059483234, Size 2GB, Preceding Table -, Location 미국(US), Monthly Cost \$60.72. An orange box highlights the '월간 비용' column, and an orange arrow points from this box to the text '예약 세부 정보 확인'.

프로젝트	크기	선행 테이블	위치	월간 비용	작업
154059483234	2GB	-	미국(US)	\$60.72	⋮

예약 세부 정보 확인

## 실습4 – 데이터 스튜디오에서 데이터 소스 연결 만들기



# Data Studio 시작하기

Recent    Reports    Data sources    Explorer

Recent

Shared with me

Owned by me

Trash

Templates

Start with a Template

Blank Report Data Studio

Tutorial Report Data Studio

Template Gallery ACME Marketing Google Analytics

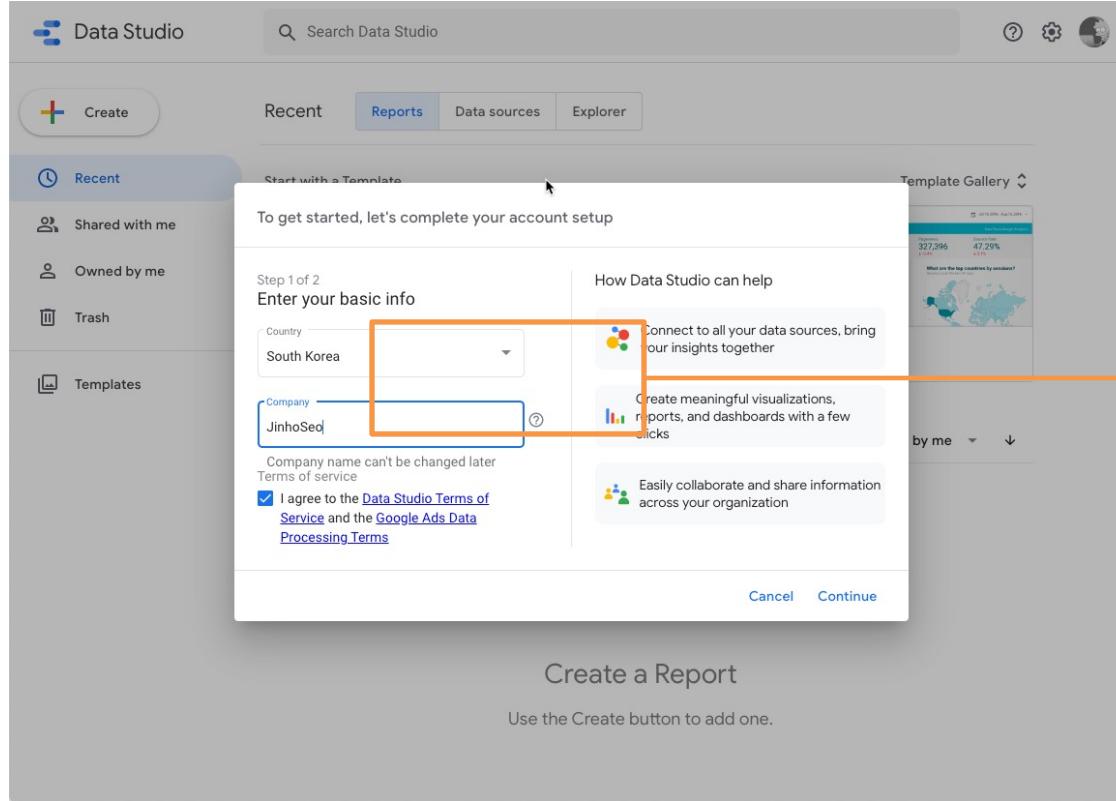
<https://datastudio.google.com>  
Black Report 클릭



## Create a Report

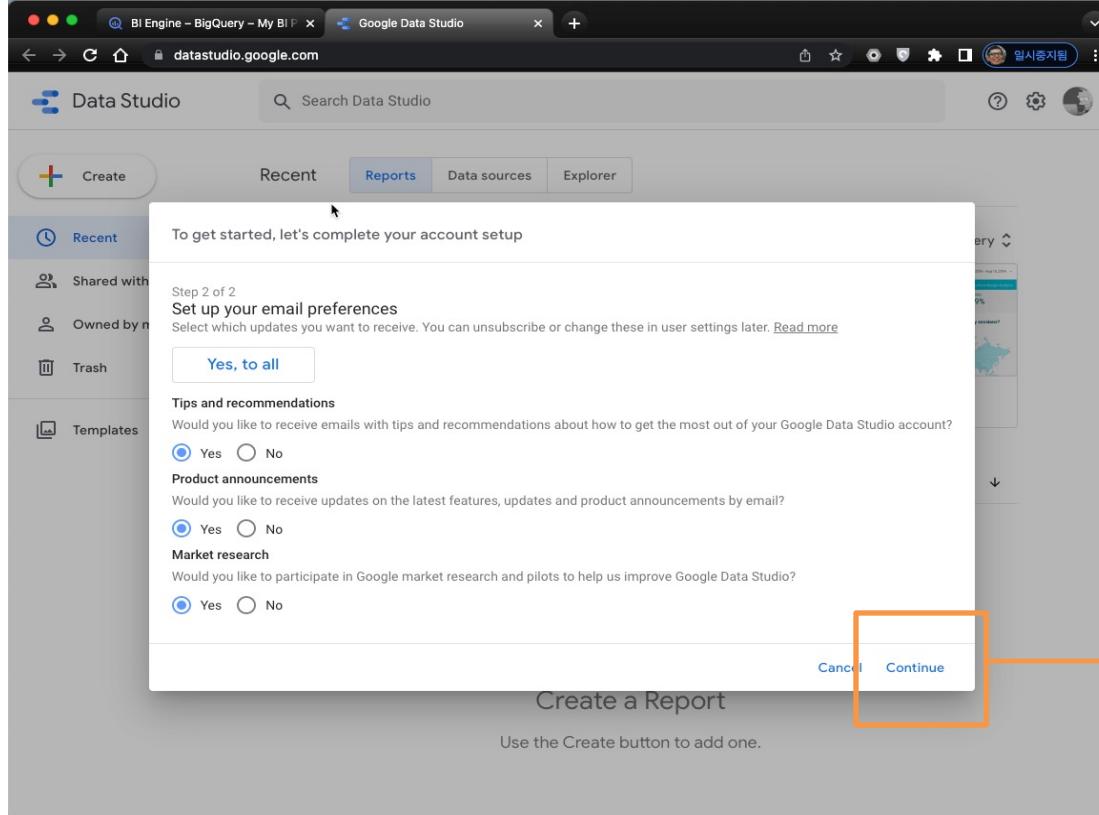
Use the Create button to add one.

# 기본 정보 입력



- Country: South Korea
- Company: JinhoSeo
- Continue 클릭

# 전자 메일 선호도



Continue 클릭

# Blank Report 선택

The screenshot shows the Google Data Studio interface. The top navigation bar has tabs for 'BI Engine - BigQuery - My BI P' and 'Google Data Studio'. The URL in the address bar is 'datastudio.google.com/navigation/reporting'. The main area has tabs for 'Create', 'Recent', 'Reports', 'Data sources', and 'Explorer'. On the left, a sidebar shows 'Recent' reports, 'Shared with me', 'Owned by me', 'Trash', and 'Templates'. The 'Recent' tab is selected. In the center, there's a 'Start with a Template' section and a 'Template Gallery' dropdown. The 'Blank Report' template under 'Recent' is highlighted with an orange box and an orange arrow points from it to the text 'Blank Report 선택' on the right. Below this, there's a table with columns for 'Name', 'Owned by anyone', and 'Last opened by me'. At the bottom, there's a 'Create a Report' section with a bar chart icon and the text 'Use the Create button to add one.'

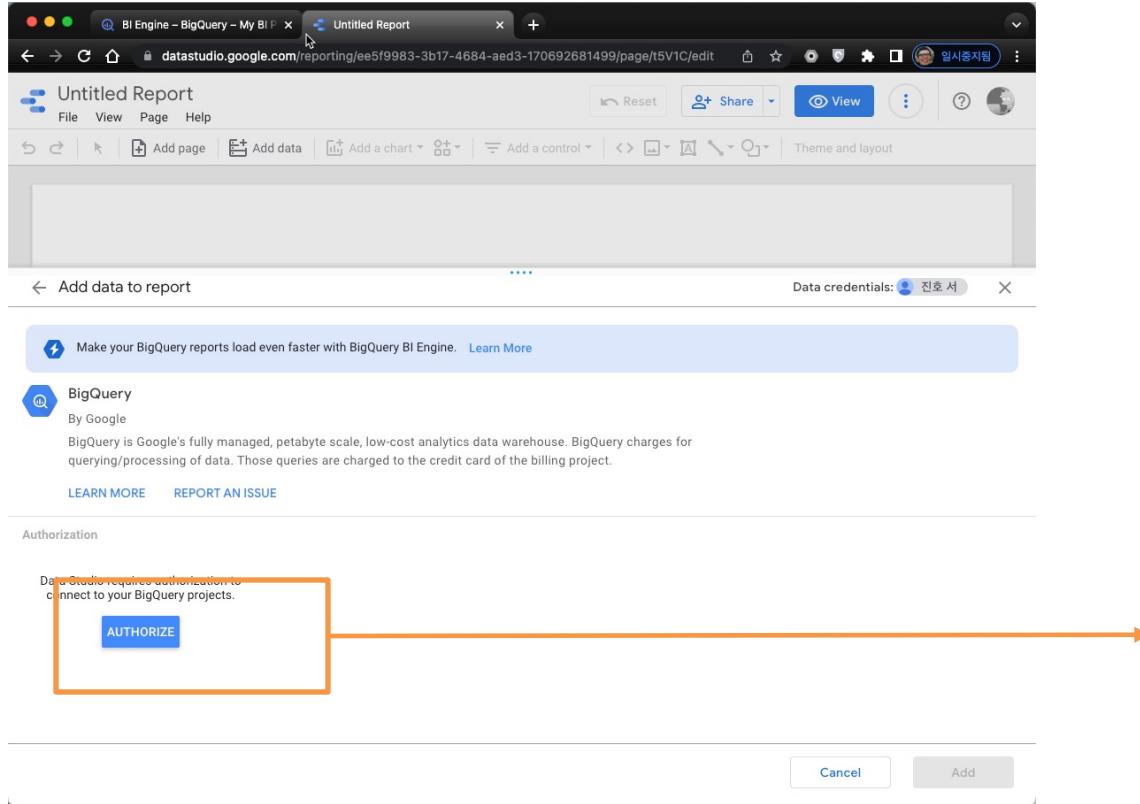
Blank Report 선택

# Add data to report - 빅쿼리 선택

The screenshot shows the Google Data Studio interface. At the top, there's a browser-like header with tabs for 'BI Engine – BigQuery – My BI Project' and 'Untitled Report'. Below the header is a toolbar with various icons for navigation, sharing, and editing. The main area is titled 'Untitled Report' and has a sub-section titled 'Add data to report'. Under this, there's a 'Connect to data' tab selected, showing a search bar and a list of connectors. The 'Google Connectors (23)' section includes options for Google Analytics, Google Ads, Google Sheets, AppSheet, and File Upload. The 'BigQuery' connector, which is the second item in the list, is highlighted with a red box and an orange arrow pointing to it from the right side of the slide.

BigQuery 클릭

# 승인(Authorization)



Authorize 클릭

# 테이블 선택

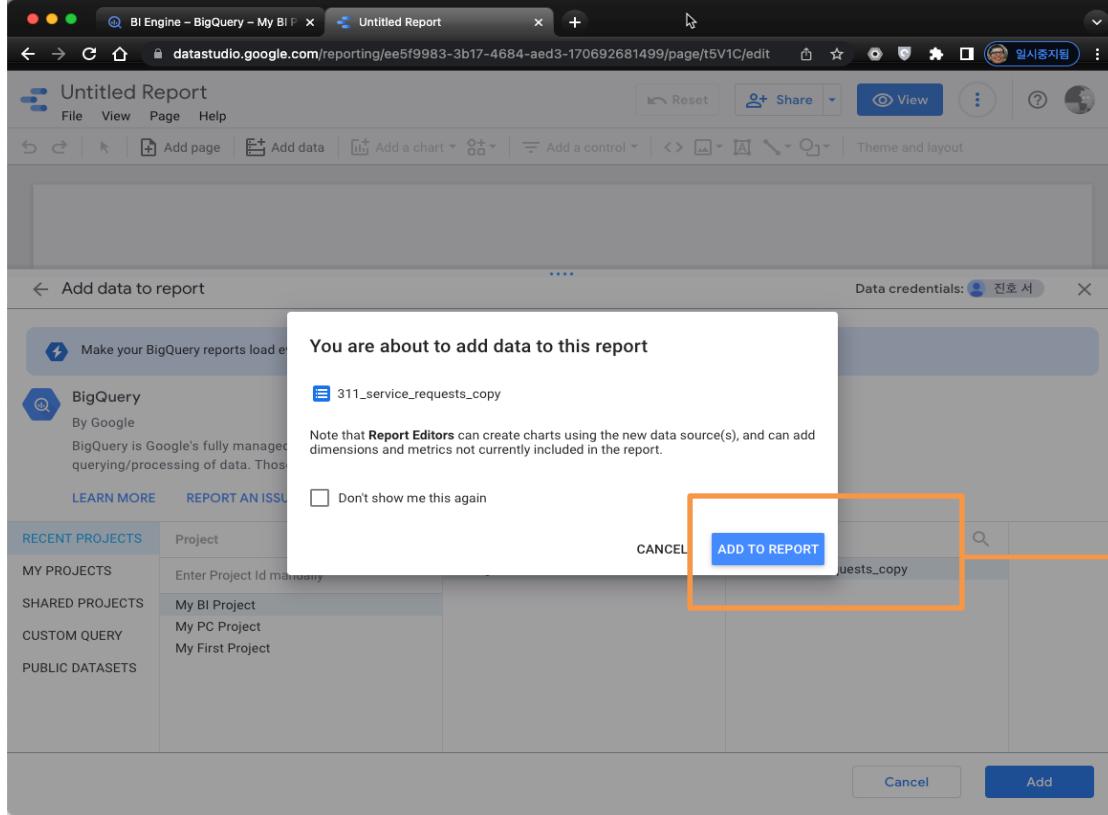
The screenshot shows the 'Untitled Report' interface in Google Data Studio. At the top, there are buttons for 'Reset', 'Share', 'View', and a three-dot menu. Below the toolbar, there are buttons for 'Add page', 'Add data', 'Add a chart', 'Add a control', and 'Theme and layout'. A message bar at the top says 'Make your BigQuery reports load even faster with BigQuery BI Engine. Learn More'. The main area is titled 'Add data to report' and shows 'Data credentials: 진호 서'. On the left, there's a 'BigQuery' section with a 'By Google' link and a note about charges. Below it are links for 'LEARN MORE' and 'REPORT AN ISSUE'. The main grid has columns for 'Project', 'Dataset', and 'Table'. The 'Dataset' column contains 'biengine\_test' and '311\_service\_requests\_copy'. An orange rectangle highlights the '311\_service\_requests\_copy' entry. An orange arrow points from this highlighted cell to the text on the right.

RECENT PROJECTS	Project	Dataset	Table
MY PROJECTS	Enter Project Id manually	biengine_test	311_service_requests_copy
SHARED PROJECTS	My BI Project		
CUSTOM QUERY	My PC Project		
PUBLIC DATASETS	My First Project		

Cancel Add

My BI Project ->  
biengine\_test ->  
311\_service\_requests\_copy 선택 후 add 클릭

# ADD TO REPORT 선택



ADD TO REPORT 클릭

## 실습5 – 차트 만들기



# 차트 리포트 만들기

The screenshot shows the Google Data Studio interface for creating a report titled "Untitled Report". On the left, a preview of the chart displays two rows of data under the "status" dimension: "Closed" (Record Count: 5,511,252) and "Open" (Record Count: 84,039). An orange box highlights the "Open" row. On the right, the "Chart" configuration panel is open, showing the "Data source" set to "311\_service\_requests\_copy". Under "Dimension", "status" is selected. Under "Metric", "Record Count" is selected. The "Optional metrics" and "Metric sliders" sections are collapsed. At the bottom, "Rows per Page" is set to 100. A large orange arrow points from the highlighted "Open" row in the preview to the "status" dimension selection in the configuration panel.

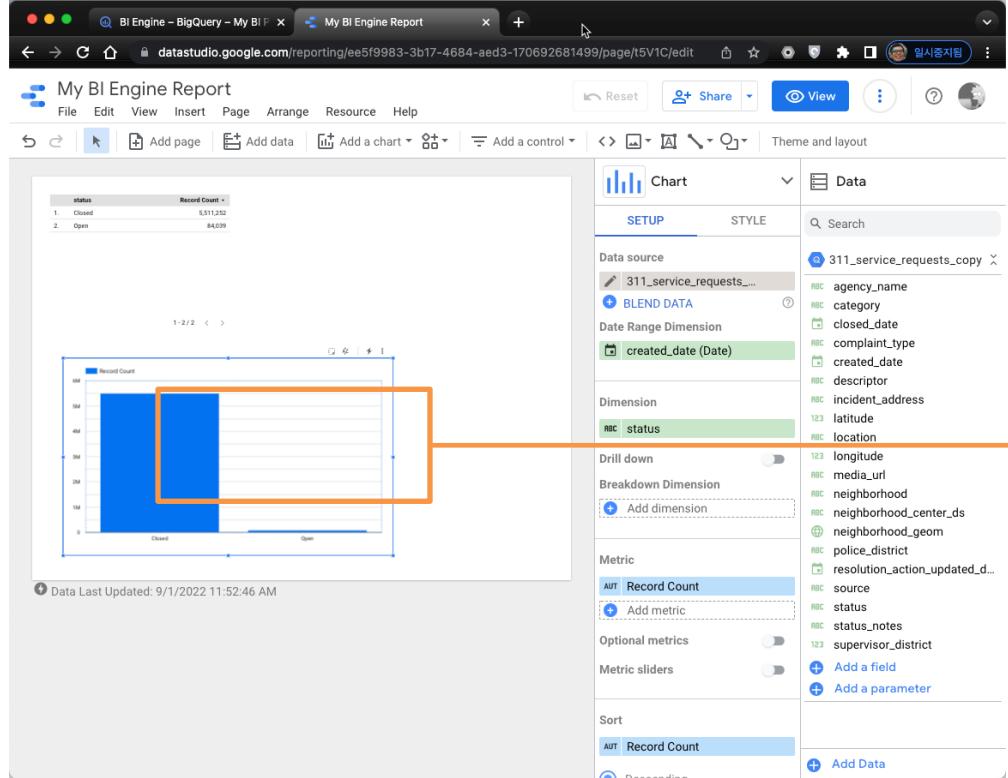
리포트 화면 확인

# Column chart 추가

The screenshot shows the Google Data Studio interface. On the left, there is a sidebar with various chart types listed: Column chart (highlighted with an orange box), Combo chart, Pie chart, Table, Bubble map, Filled map, Heatmap, Line map, Geo chart, Scorecard, Scatter chart, Bullet chart, Stacked area chart, Pivot table, Treemap, Gauge, Drop-down list, Fixed-size list, Input box, Advanced filter, Slider, Checkbox, and Date range control. In the center, there is a main workspace with tabs for 'Chart' and 'Data'. The 'Chart' tab is active, showing setup options for a 'Column chart'. The 'Data' source is set to '311\_service\_requests\_copy', with 'created\_date (Date)' as the Date Range Dimension and 'status' as the Dimension. The Metric is set to 'Record Count'. On the right, there is a list of available fields from the data source, including agency\_name, category, closed\_date, complaint\_type, created\_date, descriptor, incident\_address, latitude, location, longitude, media\_url, neighborhood, neighborhood\_center\_ds, neighborhood\_geom, police\_district, resolution\_action\_updated\_d..., source, status, status\_notes, supervisor\_district, and a section for 'Add a field' and 'Add a parameter'. At the bottom of the workspace, there are buttons for 'Rows per Page' (set to 100) and 'Summary row', along with a 'Add Data' button.

Column Chart 클릭

# 컬럼 차트 추가 (막대 그래프)



파일명을 My BI Engine Report 변경하고 막대 그래프를 확장함.

# 차트 설정

The screenshot shows a Google Data Studio interface for a 'My BI Engine Report'. On the left, there's a table titled 'Record Count' and a bar chart. The bar chart has 'Closed' and 'Open' categories on the x-axis, and various service request types on the y-axis. A legend includes 'Street and Sidewalk Cleaning', 'Abandoned Vehicle', 'Graffiti', 'Multi Feedback', 'Encampments', 'General Request - P...', 'Parking Enforcement - P...', and 'Damaged Property'. The chart shows approximately 5,511,252 for Closed and 84,039 for Open. Below the chart is a note: 'Data Last Updated: 9/1/2022 11:52:46 AM'. On the right, the 'Data' tab is open, showing the 'Data source' set to '311\_service\_requests\_copy'. Under 'Dimensions', 'created\_date (Date & Time)' is selected. Under 'Metrics', 'Record Count' is selected. The 'Sort' section shows 'Descending'.

데이터 탭에서 데이터 소스의 값이 311\_service\_requests\_copy임을 확인후, Date Range Dimensions는 created\_date 를 설정하고, Dimension에서는 Category 설정함.

# Breakdown Dimension 선택

The screenshot shows the Google Data Studio interface. On the left, there is a chart titled '311 Service Requests' showing the count of requests by neighborhood. Below the chart is a table titled 'Record Count' with two rows: 'Closed' (5,511,252) and 'Open' (84,039). On the right, the 'Chart' setup panel is open, specifically the 'Breakdown Dimension' section. A dropdown menu is open under 'Breakdown Dimension', and the option 'neighborhood' is highlighted with an orange arrow. The rest of the panel shows other dimensions like 'category', 'location', and 'neighborhood\_center'. At the bottom of the panel, there are buttons for 'Add a field' and 'Add a parameter'.

Breakdown  
Dimension 은  
neighborhood 설정

# 필터 추가

The screenshot shows a Google Data Studio report titled "My BI Engine Report". On the left, there is a bar chart with a legend for categories like "Missing", "Missing Details", "Health or Safety", "Animal Complaints", "Trespasser", "Other Residential", and "Other Non-Residential". Below the chart is a table titled "Record Count" with two rows: "Closed" (5,011,252) and "Open" (84,359). A message at the bottom says "Data Last Updated: 9/1/2022 11:52:46 AM". On the right, there is a sidebar titled "Chart" with "SETUP" selected. It includes options for sorting (Descending, Ascending), date range (Default date range, Auto, Custom, Auto date range), and interactions (Cross-filtering, Change sorting). A red box highlights the "Filter" section, which contains "Bar Chart Filter" and a blue button labeled "ADD A FILTER". An orange arrow points from this section to the text "Add Filter 선택".

Add Filter 선택

# Exclude Nulls 화면

The screenshot shows the Google Data Studio interface for a 'My BI Engine Report'. On the left, there's a preview area with a table showing 'status' and 'Record Count' (Closed: 5,911,532, Open: 84,039). Below it is a visualization with several colored bars. On the right, the 'Filter picker' sidebar is open, showing a list of fields from the dataset '311\_service\_requests\_copy': agency\_name, category, closed\_date, complaint\_type, created\_date, and descriptor. A 'Create Filter' dialog is open at the bottom left, titled 'Exclude nulls'. It contains a clause: 'Exclude RBC neighborhood Is Null OR'. An orange arrow points from the 'neighborhood' field in this clause to the explanatory text on the right.

Name: Exclude nulls  
Exclude 선택 후,  
Neighborhood 컬럼 선택  
후, Is Null 선택 다음  
Save 저장

# Exclude Nulls 확인

The screenshot shows a Google Data Studio report titled "My BI Engine Report". On the left, there is a bar chart with a legend for neighborhoods like Mission, South of Market, Tenderloin, Outer Sunset, Potrero Hill, Lower Nob Hill, and Bayview. Below the chart is a table titled "Record Count" with two rows: "Closed" (5,511,252) and "Open" (84,039). A message at the bottom says "Data Last Updated: 9/1/2022 11:52:46 AM". On the right, there is a sidebar with a "Chart" tab selected. Under the "Filter" section, the "Exclude nulls" option is highlighted with an orange rectangle and arrow. The sidebar also lists various data fields such as agency\_name, category, closed\_date, complaint\_type, created\_date, descriptor, incident\_address, latitude, location, longitude, media\_url, neighborhood, neighborhood\_center\_ds, neighborhood\_geom, police\_district, resolution\_action\_updated\_d..., source, status, status\_notes, supervisor\_district, and a few more options like "Add a field" and "Add a parameter".

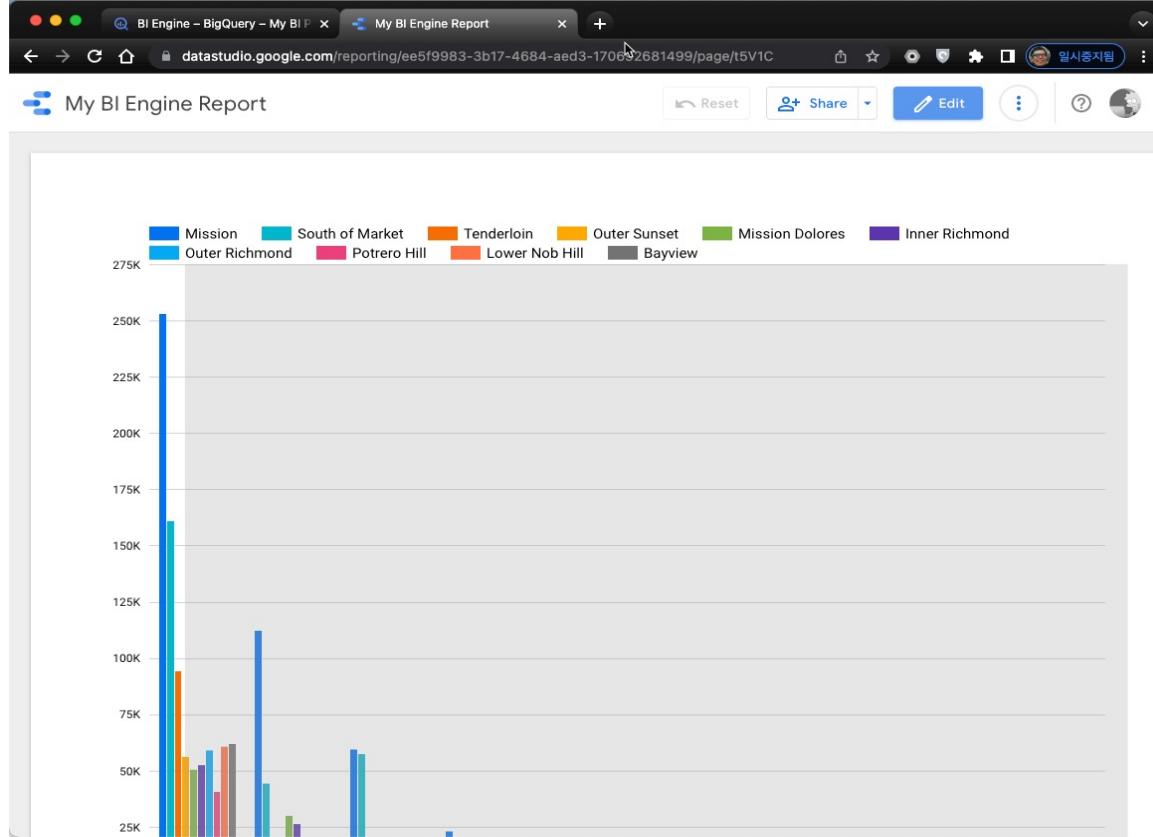
Exclude nulls 확인

# 확대 뷰

The screenshot shows the Google Data Studio interface for a report titled "My BI Engine Report". On the left, there is a bar chart with a legend for neighborhoods: Mission, South-of-Market, Tenderloin, Outer Sunset, Mission Dolores, Inner Richmond, Outer Richmond, Potrero Hill, Lower Nob Hill, Bayview, and Ingleside. The chart displays data for each neighborhood. Below the chart, a message says "Data Last Updated: 9/1/2022 12:08:07 PM". On the right, the configuration sidebar is open, showing the "Chart" setup. Under "Metric", "Record Count" is selected. A blue arrow points from the "View" button in the top navigation bar to the text "View 선택" (View Selection) in the top right corner.

View 선택

# 바 그래프 확대



## 실습6 – 프로젝트 삭제



# My BI Engine Report 삭제 화면

The screenshot shows the Google Data Studio interface. The top navigation bar includes tabs for 'BI Engine - BigQuery - My BI' and 'Google Data Studio'. The main area has tabs for 'Reports', 'Data sources', and 'Explorer'. On the left, a sidebar titled 'Recent' lists items: 'Shared with me', 'Owned by me', and 'Trash'. Below this is a 'Templates' section. The main content area displays a 'Start with a Template' section featuring three templates: 'Blank Report' (Data Studio), 'Tutorial Report' (Data Studio), and 'Acme Marketing' (Google Analytics). Below this is a table with columns 'Name', 'Owned by anyone', and 'Last opened by me'. A row for 'My BI Engine Report' is highlighted with an orange rectangle around its name, and an orange arrow points from this row to the text 'My BI Engine Report 파일 확인' located on the right side of the screen.

Name	Owned by anyone	Last opened by me
My BI Engine Report	서진호	11:50 AM

My BI Engine Report 파일 확인

# 파일 삭제

The screenshot shows the Google Data Studio interface. The top navigation bar includes tabs for 'BI Engine – BigQuery – My BI P' and 'Google Data Studio'. The main area has tabs for 'Create', 'Recent', 'Reports' (which is selected), 'Data sources', and 'Explorer'. On the left, a sidebar shows 'Recent' items: 'Shared with me', 'Owned by me', 'Trash', and 'Templates'. Under 'Recent', there are cards for 'Blank Report Data Studio', 'Tutorial Report Data Studio', and 'Acme Marketing Google Analytics'. Below this is a table of recent reports, with one entry: 'Name: My BI Engine Report, Owned by anyone: 서진호, Last opened by me: 11:50 AM'. A context menu is open over this report, listing 'Share', 'Rename', and 'Remove'. The 'Remove' option is highlighted with an orange box and an arrow pointing to it from the right.

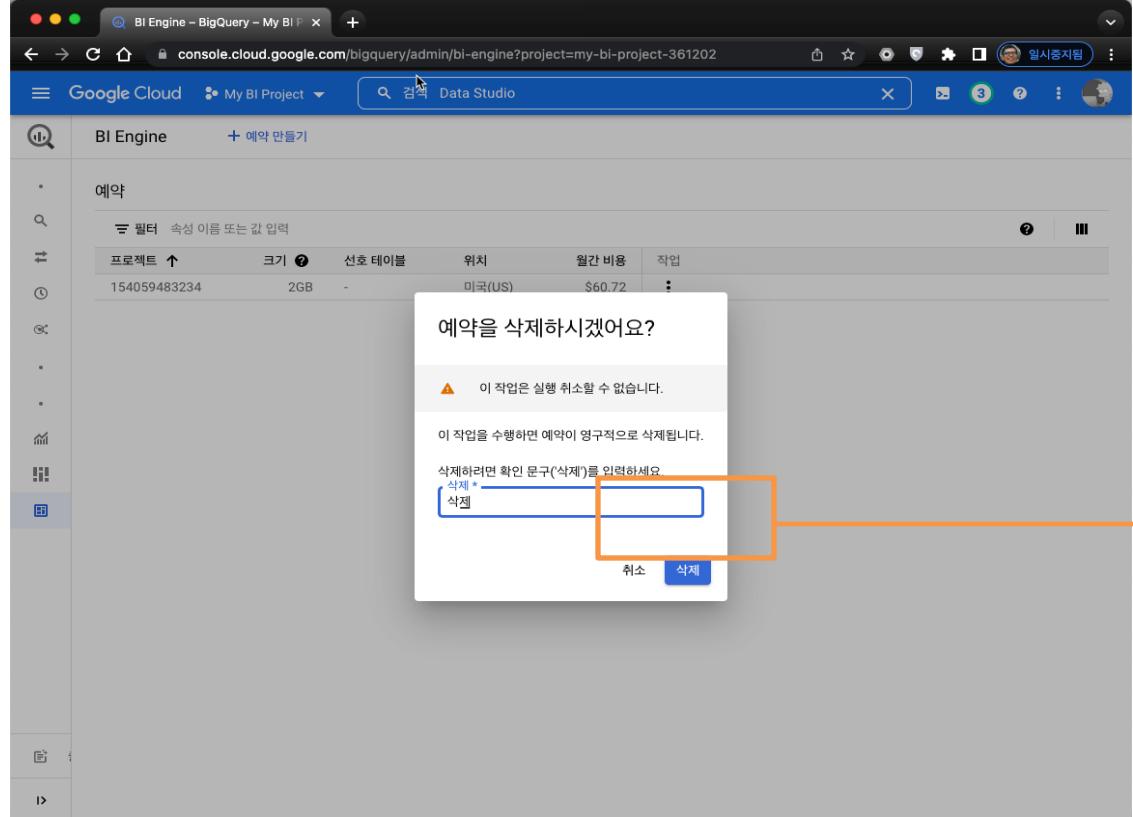
Remove 클릭

# BI Engine 예약 삭제

The screenshot shows the Google Cloud Console interface for managing BI Engine reservations. On the left, there's a sidebar with sections like BigQuery, Analytics Hub, and BI Engine (which is currently selected). The main area is titled '예약' (Reservations) and displays a table with one row of data. The table columns are: 프로젝트 (Project), 크기 (Size), 선호 테이블 (Preferred Table), 위치 (Location), and 월간 비용 (Monthly Cost). The data in the table is: 154059483234, 2GB, -, 미국(US), \$60.72. To the right of the table is a context menu with three options: '작업' (Work), '삭제' (Delete), and '수정' (Edit). An orange box highlights the '삭제' option, and an orange arrow points from it to the text '삭제 클릭' (Click to delete) located on the right side of the screen.

삭제 클릭

# BI Engine 예약 삭제 확인



삭제 입력 후 삭제 클릭

# BI Engine 예약 삭제

The screenshot shows the Google Cloud BigQuery BI Engine reservations management interface. At the top, there's a search bar with '검색 Data Studio' and a sidebar with various icons. The main area has a title 'BI Engine' and a sub-section '예약'. Below this is a table header with columns: '프로젝트 ↑', '크기', '선행 테이블', '위치', '월간 비용', and '작업'. A message at the bottom states '구매한 BI Engine 예약이 없습니다.' (No purchased BI Engine reservations available). In the bottom right corner of the screenshot, there is an orange rectangular box containing the text '예약을 삭제했습니다.' (Reservation deleted) with an 'X' button next to it. An orange arrow points from this box to the text '삭제메시지 확인' located on the right side of the slide.

삭제메시지 확인

# 311\_service\_requests\_copy 테이블

BigQuery - My BI Project - Google Cloud Platform

console.cloud.google.com/bigquery?project=my-bi-project-361202&ws=!1m0

Google Cloud My BI Project Data Studio

팀색기 + 데이터 추가 편집기 2

1 실행 저장 공유 일정 더보기 시작하려면 쿼리를 입력하세요.

입력하여 검색

고정된 프로젝트를 보는 중입니다.

my-bi-project-361202

biengine\_test

311\_service\_requests\_c...

bigquery-public-data

my-pc-project-357506

열기

다음 항목에서 열기

쿼리

ID 복사

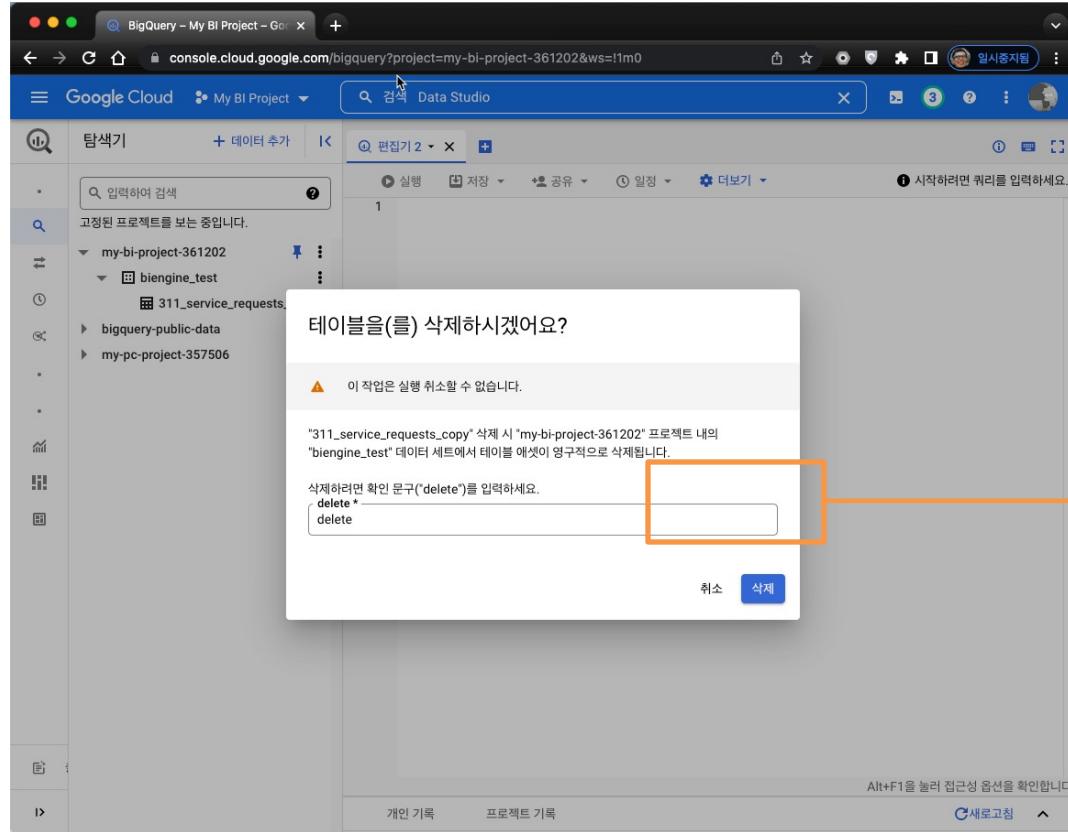
삭제

Alt+F1을 눌러 접근성 옵션을 확인합니다.

개인 기록 프로젝트 기록 새롭고침

삭제 클릭

# 311\_service\_requests\_copy 테이블 삭제



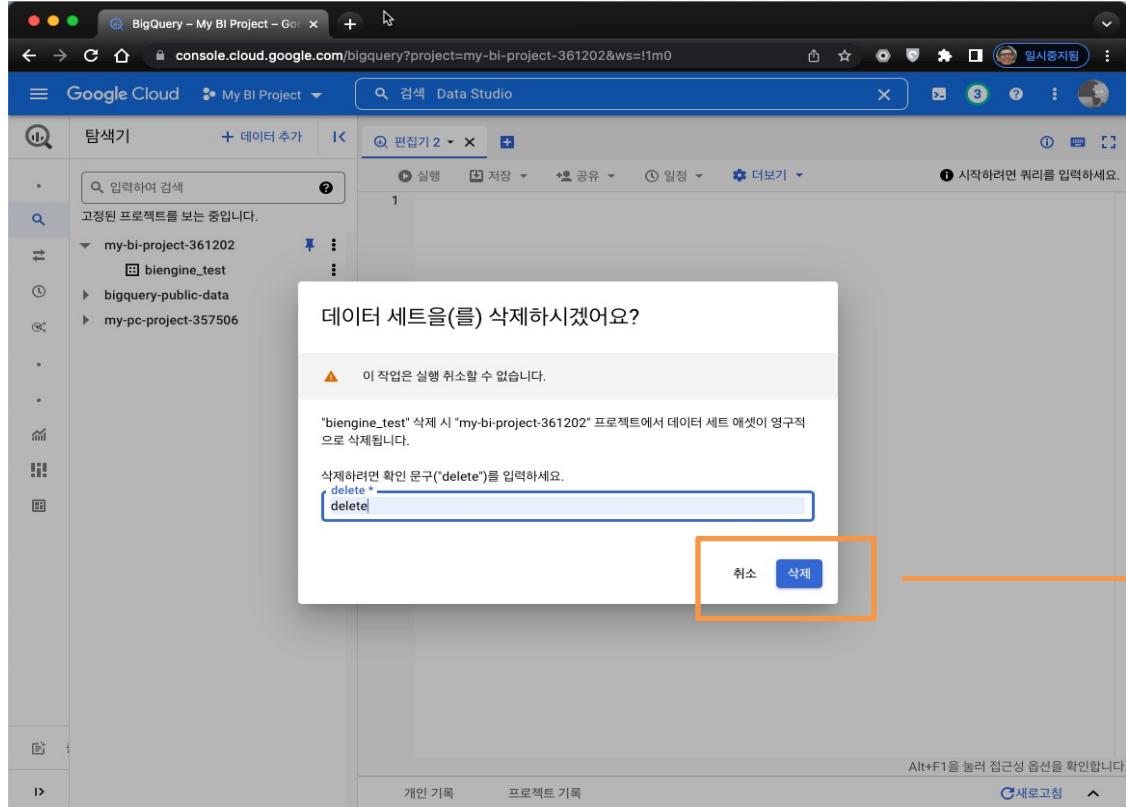
Delete 입력 후 삭제 클릭

# 데이터셋 삭제

The screenshot shows the Google Cloud BigQuery interface within a browser window. The URL is `console.cloud.google.com/bigquery?project=my-bi-project-361202&ws=!1m0`. The left sidebar lists projects: `my-bi-project-361202` (expanded, showing `bigrnne_test`), `bigrquery-public-data`, and `my-pc-project-357506`. The main area shows a dataset named `bigrnne_test` with a context menu open. The menu options are: 실행 (Execute), 저장 (Save), 공유 (Share), 일정 (Schedule), 더보기 (More), and the instruction "시작하려면 쿼리를 입력하세요." (Start by entering a query). Below the menu, there is a section titled "ID 복사" (Copy ID) with a text input field containing "삭제" (Delete). An orange arrow points from this input field to the text "삭제 클릭" (Click to delete) located on the right side of the slide.

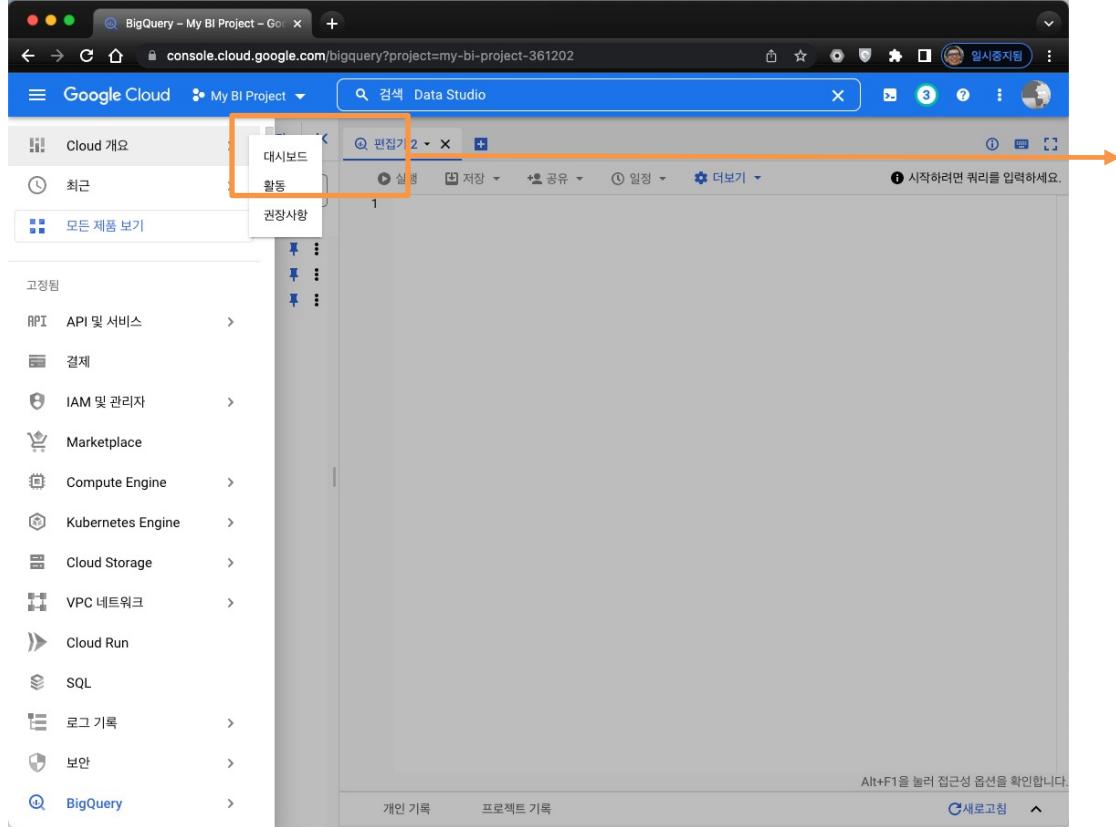
삭제 클릭

# 데이터셋 삭제



Delete 작성 후 삭제

# 대시보드 이동



대시보드 클릭

# 프로젝트에 설정으로 이동

The screenshot shows the Google Cloud Platform dashboard for the project "My BI Project". On the left sidebar, under the "프로젝트 정보" section, there is a link labeled "프로젝트 설정으로 이동" (Move to Settings). This link is highlighted with a red rectangular box. The main content area displays several cards: "API API" (No data available), "Google Cloud Platform 상태" (Global: Increase in failure rate for SQLServer Instance Creation), "결제" (Billing), and "모니터링" (Monitoring).

프로젝트 설정으로 이동

# 프로젝트 종료

설정 – IAM 및 관리자 – My BI Project

console.cloud.google.com/iam-admin/settings?project=my-bi-project-361202

Google Cloud My BI Project

검색 Data Studio

IAM 및 관리자

설정 이전 종료

알아보기

IAM

ID 및 조직

정책 문제 해결 도구

정책 분석자

조직 정책

서비스 계정

워크로드 아이덴티티 제휴

라벨

태그

설정

개인정보 보호 및 보안

IAP(Identity-Aware Proxy)

역할

감사 로그

리소스 관리

출시 노트

프로젝트 이름 \*  
My BI Project

저장

프로젝트 ID  
my-bi-project-361202

프로젝트 번호:  
154059483234

액세스 투명성

조작에 속하지 않은 프로젝트에는 액세스 투명성이 제공되지 않습니다. 단일 프로젝트에 액세스 투명성을 사용 설정하려면 영입팀이나 지원팀에 문의하세요.

설정 – IAM 및 관리자 – My BI Project

console.cloud.google.com/iam-admin/settings?project=my-bi-project-361202

Google Cloud My BI Project

검색 Data Studio

IAM 및 관리자

설정 이전 종료

알아보기

프로젝트 이름 \*  
My BI Project

저장

"My BI Project" 프로젝트 종료

프로젝트를 종료하면 즉시 다음과 같은 결과가 발생합니다.

모든 결제 및 트래픽 전달이 중지됩니다.  
프로젝트에 액세스할 수 없게 됩니다.  
프로젝트 소유자에게 알림이 전송되며 소유자는 30일 이내에 삭제를 중지할 수 있습니다.  
프로젝트가 30일 후에 삭제되도록 예약됩니다. 하지만 일부 리소스는 훨씬 먼저 삭제될 수 있습니다.

설정하려면 영입팀이나 지원팀에 문의하세요.

프로젝트가 30일 후에 삭제되도록 예약됩니다. 하지만 일부 리소스는 훨씬 먼저 삭제될 수 있습니다.

"My BI Project" 프로젝트를 종료하려면 다음 프로젝트 ID를 입력하세요. my-bi-project-361202

프로젝트 ID \*  
my-bi-project-361202

자세히 알아보기

취소 종료