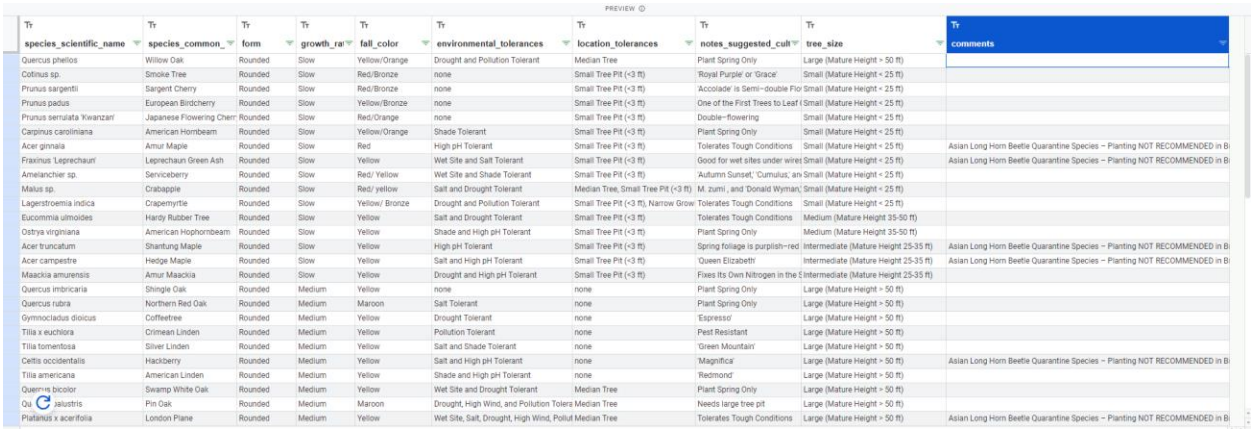
Saya memiliki data tentang berbagai jenis pohon yang dapat ditemui di New York. Data ini mencakup informasi seperti:

1. Nama ilmiah dan umum spesies pohon
2. Bentuk pohon
3. Tingkat Pertumbuhan
4. Warna dedaunan pada musim gugur
5. Toleransi lingkungan
6. Toleransi lokasi
7. Catatan tentang varietas yang direkomendasikan
8. Ukuran pohon
9. Komentar mengenai saran penanaman

Dengan menggunakan dataset ini, saya ingin menjelaskan variasi dan karakteristik pohon yang dapat dijumpai di New York kepada semua orang, termasuk mereka yang tidak memiliki latar belakang dalam pengolahan data.

```
SELECT * FROM `bigquery-public-data.new_york_trees.tree_species`
```



species_scientific_name	species_common_	form	growth_ra	fall_color	environmental_tolerances	location_tolerances	notes_suggested_cult	tree_size	comments
Quercus phellos	Willow Oak	Rounded	Slow	Yellow/Orange	Drought and Pollution Tolerant	Median Tree	Plant Spring Only	Large (Mature Height > 50 ft)	
Cotinus sp.	Smoke Tree	Rounded	Slow	Red/Bronze	none	Small Tree Pit (<3 ft)	'Royal Purple' or 'Grace'	Small (Mature Height < 25 ft)	
Prunus sargentii	Sargent Cherry	Rounded	Slow	Red/Bronze	none	Small Tree Pit (<3 ft)	'Accolade' is Semi-double Flo	Small (Mature Height < 25 ft)	
Prunus padus	European Birdcherry	Rounded	Slow	Yellow/Bronze	none	Small Tree Pit (<3 ft)	One of the First Trees to Leaf	Small (Mature Height < 25 ft)	
Prunus serrulata 'Kwanzan'	Japanese Flowering Cherr	Rounded	Slow	Red/Orange	none	Small Tree Pit (<3 ft)	Double-flowering	Small (Mature Height < 25 ft)	
Carpinus caroliniana	American Hornbeam	Rounded	Slow	Yellow/Orange	Shade Tolerant	Small Tree Pit (<3 ft)	Plant Spring Only	Small (Mature Height < 25 ft)	
Acer ginnala	Amur Maple	Rounded	Slow	Red	High pH Tolerant	Small Tree Pit (<3 ft)	Tolerates Tough Conditions	Small (Mature Height < 25 ft)	Asian Long Horn Beetle Quarantine Species – Planting NOT RECOMMENDED in B
Fraxinus 'Leprechaun'	Leprechaun Green Ash	Rounded	Slow	Yellow	Wet Site and Salt Tolerant	Small Tree Pit (<3 ft)	Good for wet sites under wire	Small (Mature Height < 25 ft)	Asian Long Horn Beetle Quarantine Species – Planting NOT RECOMMENDED in B
Amelanchier sp.	Serviceberry	Rounded	Slow	Red/ Yellow	Wet Site and Shade Tolerant	Small Tree Pit (<3 ft)	'Autumn Sunset,' 'Cumulus,' an	Small (Mature Height < 25 ft)	
Malus sp.	Crabapple	Rounded	Slow	Red/ yellow	Salt and Drought Tolerant	Median Tree, Small Tree Pit (<3 ft)	M. zumi , and 'Donald Wyman'	Small (Mature Height < 25 ft)	
Lagerstroemia indica	Crapemyrtle	Rounded	Slow	Yellow/ Bronze	Drought and Pollution Tolerant	Small Tree Pit (<3 ft), Narrow Grow	Tolerates Tough Conditions	Small (Mature Height < 25 ft)	
Eucommia ulmoides	Hardy Rubber Tree	Rounded	Slow	Yellow	Salt and Drought Tolerant	Small Tree Pit (<3 ft)	Tolerates Tough Conditions	Medium (Mature Height 35-50 ft)	
Ostrya virginiana	American Hophornbeam	Rounded	Slow	Yellow	Shade and High pH Tolerant	Small Tree Pit (<3 ft)	Plant Spring Only	Medium (Mature Height 35-50 ft)	
Acer truncatum	Shantung Maple	Rounded	Slow	Yellow	High pH Tolerant	Small Tree Pit (<3 ft)	Spring foliage is purplish-red	Intermediate (Mature Height 25-35 ft)	Asian Long Horn Beetle Quarantine Species – Planting NOT RECOMMENDED in B
Acer campestre	Hedge Maple	Rounded	Slow	Yellow	Salt and High pH Tolerant	Small Tree Pit (<3 ft)	'Queen Elizabeth'	Intermediate (Mature Height 25-35 ft)	Asian Long Horn Beetle Quarantine Species – Planting NOT RECOMMENDED in B
Maackia amurensis	Amur Maackia	Rounded	Slow	Yellow	Drought and High pH Tolerant	Small Tree Pit (<3 ft)	Fixes Its Own Nitrogen in the S	Intermediate (Mature Height 25-35 ft)	
Quercus imbricaria	Shingle Oak	Rounded	Medium	Yellow	none	none	Plant Spring Only	Large (Mature Height > 50 ft)	
Quercus rubra	Northern Red Oak	Rounded	Medium	Maroon	Salt Tolerant	none	Plant Spring Only	Large (Mature Height > 50 ft)	
Gymnocladus dioicus	Coffeetree	Rounded	Medium	Yellow	Drought Tolerant	none	'Espresso'	Large (Mature Height > 50 ft)	
Tilia x euchlora	Crimean Linden	Rounded	Medium	Yellow	Pollution Tolerant	none	Pest Resistant	Large (Mature Height > 50 ft)	
Tilia tomentosa	Silver Linden	Rounded	Medium	Yellow	Salt and Shade Tolerant	none	'Green Mountain'	Large (Mature Height > 50 ft)	
Celtis occidentalis	Hackberry	Rounded	Medium	Yellow	Salt and High pH Tolerant	none	'Magnifica'	Large (Mature Height > 50 ft)	Asian Long Horn Beetle Quarantine Species – Planting NOT RECOMMENDED in B
Tilia americana	American Linden	Rounded	Medium	Yellow	Shade and High pH Tolerant	none	'Redmond'	Large (Mature Height > 50 ft)	
Quercus bicolor	Swamp White Oak	Rounded	Medium	Yellow	Wet Site and Drought Tolerant	Median Tree	Plant Spring Only	Large (Mature Height > 50 ft)	
Qu palustris	Pin Oak	Rounded	Medium	Maroon	Drought, High Wind, and Pollution Toler	Median Tree	Needs large tree pit	Large (Mature Height > 50 ft)	
Platanus x acerifolia	London Plane	Rounded	Medium	Yellow	Wet Site, Salt, Drought, High Wind, Pollut	Median Tree	Tolerates Tough Conditions	Large (Mature Height > 50 ft)	Asian Long Horn Beetle Quarantine Species – Planting NOT RECOMMENDED in B

- **CASE STUDY 1**
  Keragaman Spesies Pohon
  Insight : Dataset ini mencakup berbagai jenis pohon dari segala jenis lingkungan sehingga dapat mengetahui keragaman spesies pohon.

```
SELECT
species_scientific_name,
species_common_name
FROM `bigquery-public-data.new_york_trees.tree_species`
ORDER BY species_scientific_name ASC
```

Row	species_scientific_name	species_common_name
1	Acer campestre	Hedge Maple
2	Acer ginnala	Amur Maple
3	Acer rubrum	Red Maple
4	Acer truncatum	Shantung Maple
5	Amelanchier sp.	Serviceberry
6	Carpinus betulus	European Hornbeam
7	Carpinus caroliniana	American Hornbeam
8	Celtis occidentalis	Hackberry
9	Cercidiphyllum japonicum	Katsura Tree
10	Cercis canadensis	Eastern Redbud
11	Cornus mas	Cornelian Cherry
12	Corylus colurna	Turkish Filbert
13	Cotinus sp.	Smoke Tree
14	Crataegus sp.	Hawthorn

CASE STUDY 2

Pertumbuhan Cepat vs Pertumbuhan Lama

Insight : Menemukan perbandingan antara pohon yang tumbuh cepat dan pohon yang tumbuh lambat dapat memberikan pandangan tentang pilihan tanaman yang sesuai dengan kebutuhan waktu.

```
SELECT
  growth_rate,
  COUNT(DISTINCT species_common_name) AS total_trees,
  STRING_AGG(DISTINCT species_common_name, '-') AS list_of_tree
FROM
  `bigquery-public-data.new_york_trees.tree_species`
GROUP BY
  growth_rate
ORDER BY
  total_trees ASC
```

Row	growth_rate	total_trees	list_of_tree
1	Slow	19	Willow Oak-Smoke Tree-Sargent Cherry-European Birdcherry-Japanese Flowering Cherry-American Hornbeam-Amur Maple-Leprechaun Green Ash-Serviceberry-Crabapple-Crapemyrtle-Hardy Rubber Tree-American Hophornbeam-Shantung Maple-Hedge Maple-Amur Maackia-Fastigiata Oak-Ginkgo-English Oak
2	Medium	38	Shingle Oak-Northern Red Oak-Coffeetree-Crimean Linden-Silver Linden-Hackberry-American Linden-Swamp White Oak-Pin Oak-London Plane-Honeylocust-Okame Cherry-Yoshino Cherry-Cornelian Cherry-Purpleleaf Plum-Hawthorn-Eastern Redbud-Japanese Tree Lilac-Chinese Elm-Katsura Tree-Red Maple-Sawtooth Oak-Sch...

CASE STUDY 3

Warna Daun Musim Gugur yang Menarik

Insight : Identifikasi pohon dengan warna daun musim gugur yang paling mencolok, memberikan keindahan yang berkelanjutan sepanjang tahun.

```
SELECT
  fall_color,
  COUNT(DISTINCT species_common_name) AS total_trees,
  STRING_AGG(DISTINCT species_common_name, '-') AS list_of_tree
FROM
  `bigquery-public-data.new_york_trees.tree_species`
GROUP BY
  fall_color
ORDER BY
  total_trees ASC
```

Row	fall_color	total_trees	list_of_tree
1	Yellow/Bronze	1	European Birdcherry
2	Red/Orange	1	Japanese Flowering Cherry
3	Red/ Yellow	1	Serviceberry
4	Red/ yellow	1	Crabapple
5	Yellow/ Bronze	1	Crapemyrtle
6	Cream	1	Scholar Tree
7	Purple/Maroon	1	White Ash
8	Orange/Brown	2	Dawn Redwood-Baldcypress
9	Yellow/Orange	3	Willow Oak-American Hornbeam-Katsura Tree
10	Red	3	Amur Maple-Red Maple-Black Gum
11	Red/Bronze	4	Smoke Tree-Sargent Cherry-Okame Cherry-Japanese Zelkova
12	Maroon	7	Northern Red Oak-Pin Oak-Purpleleaf Plum-Hawthorn-Callery Pear-Fastigiata Oak-Schubert Cherry
13	Yellow	31	Leprechaun Green Ash-Hardy Rubber Tree-American Hophornbeam-Shantung Maple-Hedge Maple-Amur Maackia-Shingle Oak-Coffeetree-Crimean Linden-Silver Linden-Hackberry-American Linden-Swamp White Oak-

CASE STUDY 4

Toleransi Lingkungan dan Lokasi

Insight : Menemukan pohon yang toleran terhadap lingkungan dan lokasi yang hanya memerlukan lubang pohon yang sempat dan ruang tumbuh yang sempit, sehingga membantu dalam perencanaan taman yang lebih efektif.

```
SELECT
species_common_name,
environmental_tolerances,
location_tolerances
FROM
  `bigquery-public-data.new_york_trees.tree_species`
WHERE
location_tolerances LIKE '%Narrow Growing Space%'
AND location_tolerances LIKE '%Small Tree Pit (<3 ft)%'
```

Row	species_common_name	environmental_tolerances	location_tolerances
1	Crapemyrtle	Drought and Pollution Tolerant	Small Tree Pit (<3 ft), Narrow Growing Space
2	Japanese Tree Lilac	Salt, Drought, and Shade Tolera...	Median Tree, Small Tree Pit (<3 ft), Narrow Growing Space
3	English Oak	Salt and High pH Tolerant	Small Tree Pit (<3 ft), Narrow Growing Space
4	European Hornbeam	Salt, Drought, Pollution and Sha...	Small Tree Pit (<3 ft), Narrow Growing Space

- **CASE STUDY 5**

  Cultivar Terpopuler

  Insight : Mengenali cultivar yang populer dapat memberikan petunjuk bagi pemilik kebun yang mencari variasi yang terbukti berhasil.

```
SELECT
species_common_name,
notes_suggested_cultivars
FROM
`bigquery-public-data.new_york_trees.tree_species`
```

Row	species_common_name	notes_suggested_cultivars
1	Willow Oak	Plant Spring Only
2	Smoke Tree	'Royal Purple' or 'Grace'
3	Sargent Cherry	'Accolade' is Semi−double Flowering;
4	European Birdcherry	One of the First Trees to Leaf Out in the Spring
5	Japanese Flowering Cherry	Double−flowering
6	American Hornbeam	Plant Spring Only
7	Amur Maple	Tolerates Tough Conditions
8	Leprechaun Green Ash	Good for wet sites under wires
9	Serviceberry	'Autumn Sunset,' 'Cumulus,' and 'White Pillar'
10	Crabapple	M. zumi , and 'Donald Wyman,' 'Spring Snow' is ...
11	Crapemyrtle	Tolerates Tough Conditions
12	Hardy Rubber Tree	Tolerates Tough Conditions

- CASE STUDY 6

  Ukuran Pohon dan Penempatannya

  Insight : Pohon yang sesuai dengan ukuran tertentu dapat direkomendasikan untuk area tertentu, memberikan panduan dalam perencanaan tata letak taman.

```
SELECT
species_common_name,
tree_size,
location_tolerances
FROM
`bigquery-public-data.new_york_trees.tree_species`
```

Row	species_common_name	tree_size	location_tolerances
1	Willow Oak	Large (Mature Height > 50 ft)	Median Tree
2	Smoke Tree	Small (Mature Height < 25 ft)	Small Tree Pit (<3 ft)
3	Sargent Cherry	Small (Mature Height < 25 ft)	Small Tree Pit (<3 ft)
4	European Birdcherry	Small (Mature Height < 25 ft)	Small Tree Pit (<3 ft)
5	Japanese Flowering Cherry	Small (Mature Height < 25 ft)	Small Tree Pit (<3 ft)
6	American Hornbeam	Small (Mature Height < 25 ft)	Small Tree Pit (<3 ft)
7	Amur Maple	Small (Mature Height < 25 ft)	Small Tree Pit (<3 ft)
8	Leprechaun Green Ash	Small (Mature Height < 25 ft)	Small Tree Pit (<3 ft)
9	Serviceberry	Small (Mature Height < 25 ft)	Small Tree Pit (<3 ft)
10	Crabapple	Small (Mature Height < 25 ft)	Median Tree, Small Tree Pit (<3...
11	Crapemyrtle	Small (Mature Height < 25 ft)	Small Tree Pit (<3 ft), Narrow G...
12	Hardy Rubber Tree	Medium (Mature Height 35-50 ft)	Small Tree Pit (<3 ft)
13	American Hophornbeam	Medium (Mature Height 35-50 ft)	Small Tree Pit (<3 ft)

CASE STUDY 7

Mencari tahu bentuk pohon yang paling dominan

Insight : pohon yang memiliki jenis bentuk paling banyak adalah bentuk yang paling populer saat ini.

```
SELECT
  form,
  COUNT(DISTINCT species_common_name) AS total_trees,
  STRING_AGG(DISTINCT species_common_name, '-') AS list_of_tree
FROM
  `bigquery-public-data.new_york_trees.tree_species`
GROUP BY
  form
ORDER BY
  total_trees ASC
```

Row	form	total_trees	list_of_tree
1	Vase–Like	2	American Elm-Japanese Zelkova
2	Upright	4	Fastigiata Oak-Ginkgo-English Oak-European Hornbeam
3	Pyramidal	10	Tulip Tree-Sweetgum-Littleleaf Linden-Green Ash-White Ash-Dawn Redwood-Baldcypress-Schubert Cherry-Black Gum-Turkish Filbert
4	Rounded	41	Willow Oak-Smoke Tree-Sargent Cherry-European Birdcherry-Japanese Flowering Cherry-American Hornbeam-Amur Maple-Leprechaun Green Ash-Serviceberry-Crabapple-Crapemyrtle-Hardy Rubber Tree-American Hophornbeam-Shantung Maple-Hedge Maple-Amur Maackia-Shingle Oak-Northern Red Oak-Coffeetree-Crimean Linde...

CASE STUDY 8

Jenis Wilayah yang Cocok untuk Menanam Pohon

Insight : Pemahaman mendalam tentang cara terbaik menanam dan merawat pohon tertentu dapat memberikan nilai tambah bagi pemilik kebun. Terdapat 2 jenis wilayah yang

dapat dijadikan patokan, yaitu wilayah yang memiliki pH tinggi (pesisir Pantai) dan wilayah yang memiliki tinggi polusi.

```
SELECT
  'Wilayah Tinggi Polutan' AS jenis_wilayah,
  STRING_AGG(DISTINCT
    CASE WHEN environmental_tolerances LIKE '%Pollution%' THEN species_common_name END, '-') AS list_pohon
FROM
  `bigquery-public-data.new_york_trees.tree_species`
GROUP BY
  jenis_wilayah

UNION ALL

SELECT
  'Wilayah Pesisir Pantai' AS jenis_wilayah,
  STRING_AGG(DISTINCT
    CASE WHEN environmental_tolerances LIKE '%High pH Tolerant%' THEN species_common_name END, '-') AS list_pohon
FROM
  `bigquery-public-data.new_york_trees.tree_species`
GROUP BY
  jenis_wilayah
```

Row	jenis_wilayah	list_pohon
1	Wilayah Tinggi Polutan	Willow Oak-Crapemyrtle-Crimean Linden-Pin Oak-London Plane-Honeylocust-Scholar Tree-Goldenraintree-Callery Pear-Ginkgo-European Hornbeam-Littleleaf Linden-Green Ash-White Ash-Schubert Cherry-Japanese Zelkova
2	Wilayah Pesisir Pantai	Amur Maple-American Hophornbeam-Shantung Maple-Hedge Maple-Amur Maackia-Hackberry-American Linden-London Plane-Honeylocust-Eastern Redbud-Chinese Elm-Sawtooth Oak-Goldenraintree-Callery Pear-Ginkgo-English Oak-Green Ash-White Ash-Dawn Redwood-Schubert Cherry-Turkish Filbert-American Elm-Japanese Zel...

CASE STUDY 9

Mengetahui pohon apa saja yang dapat tumbuh dengan baik meskipun berada di lingkungan yang tidak baik.

Insight : Menemukan hubungan antara pertumbuhan cepat dan tingkat toleransi lingkungan dapat membantu pemilik taman memilih pohon yang sesuai dengan kondisi tanah dan cuaca setempat.

```
SELECT
  growth_rate,
  STRING_AGG(species_common_name, ',') AS list_tree,
  STRING_AGG(DISTINCT environmental_tolerances, ', ') AS  environmental
FROM
  `bigquery-public-data.new_york_trees.tree_species`
GROUP BY
  growth_rate
```

Row	growth_rate	list_tree	lingkungan
1	Slow	Willow Oak,Smoke Tree,Sargent Cherry,European Birdcherry,Japanese Flowering Cherry,American Hornbeam,Amur Maple,Leprechaun Green Ash,Serviceberry,Crabapple,Crapemyrtle,Hardy Rubber Tree,American Hophornbeam,Shantung Maple,Hedge	Drought and Pollution Tolerant, none, Shade Tolerant, High pH Tolerant, Wet Site and Salt Tolerant, Wet Site and Shade Tolerant, Salt and Drought Tolerant, Shade and High pH Tolerant, Salt and High pH Tolerant, Drought and High pH Tolerant, Salt, Drought, High Wind, Pollution and High pH Tolerant
2	Medium	Shingle Oak,Northern Red Oak,Coffeetree,Crimean Linden,Silver Linden,Hackberry,American Linden,Swamp White Oak,Pin Oak,London Plane,Honeylocust,Okame Cherry,Yoshino Cherry,Cornelian Cherry,Purpleleaf	none, Salt Tolerant, Drought Tolerant, Pollution Tolerant, Salt and Shade Tolerant, Salt and High pH Tolerant, Shade and High pH Tolerant, Wet Site and Drought Tolerant, Drought, High Wind, and Pollution Tolerant, Wet Site, Salt, Drought, High Wind, Pollution and High pH Tolerant, Wet Site, Salt, Dr...

CASE STUDY 10

Mendapatkan rekomendasi tempat untuk menanam pohon

Insight : Beberapa informasi mengenai pohon dan saran untuk menanam pohon tersebut.

```
SELECT
  species_common_name,
  environmental_tolerances,
  location_tolerances,
  comments

FROM
  `bigquery-public-data.new_york_trees.tree_species`
WHERE
IFNULL(comments, '') != ''
```

Row	species_common_name	environmental_tolerances	location_tolerances	comments
1	Amur Maple	High pH Tolerant	Small Tree Pit (<3 ft)	Asian Long Horn Beetle Quarantine Species – Planting NOT RECOMMENDED in Brooklyn, Manhattan, Queens, and Staten Island
2	Leprechaun Green Ash	Wet Site and Salt Tolerant	Small Tree Pit (<3 ft)	Asian Long Horn Beetle Quarantine Species – Planting NOT RECOMMENDED in Brooklyn, Manhattan, Queens, and Staten Island
3	Shantung Maple	High pH Tolerant	Small Tree Pit (<3 ft)	Asian Long Horn Beetle Quarantine Species – Planting NOT RECOMMENDED in Brooklyn, Manhattan, Queens, and Staten Island
4	Hedge Maple	Salt and High pH Tolerant	Small Tree Pit (<3 ft)	Asian Long Horn Beetle Quarantine Species – Planting NOT RECOMMENDED in Brooklyn, Manhattan, Queens, and Staten Island
5	Hackberry	Salt and High pH Tolerant	none	Asian Long Horn Beetle Quarantine Species – Planting NOT RECOMMENDED in Brooklyn, Manhattan, Queens, and Staten Island
6	London Plane	Wet Site, Salt, Drought, High Wind, Pollution and High pH Tolerant	Median Tree	Asian Long Horn Beetle Quarantine Species – Planting NOT RECOMMENDED in Brooklyn, Manhattan, Queens, and Staten Island
7	Chinese Elm	Salt and High pH Tolerant	none	Asian Long Horn Beetle Quarantine Species – Planting NOT