

## 1. Year-wise trend of rice production across states (top 3)

**Query:**

```
select year, state_name, rice_production  
from(  
    select year, state_name, sum(rice_production_1000_tons) as rice_production,  
    rank() over(partition by year order by sum(rice_production_1000_tons) desc) as rnk  
    from agri_data  
    group by year, state_name)  
where rnk <= 3  
order by year, rice_production desc;
```

**Output:**

year	state_name	rice_production
1966	West Bengal	4819.400
1966	Tamil Nadu	3793.000
1966	Orissa	3691.790
1967	West Bengal	4865.770
1967	Tamil Nadu	3848.000
1967	Orissa	3755.470

## 2.Top 5 districts by wheat yield increase over the last 5 years

**Query:**

```
select dist_name,  
(sum(if(year=(select max(year) from agri_data), wheat_yield_kg_per_ha, null)) -  
sum(if(year=(select max(year)-4 from agri_data), wheat_yield_kg_per_ha, null))) as yield_increase  
from agri_data  
group by dist_name  
order by yield_increase desc  
limit 5;
```

**Output:**

dist_name	yield_increase
Chamba	2015.440
Vidisha	1815.150
Dewas	1800.550
Damoh	1645.570
Darjeeling	1586.630

### **3. States with the highest growth in oilseed production (5-year growth rate)**

**Query:**

```
set @current_year = (select max(year) from agri_data);

set @ago_5 = @current_year - 4;

select state_name,
       sum(if(year=@current_year, oilseeds_production_1000_tons, 0)) as current_year,
       sum(if(year=@ago_5, oilseeds_production_1000_tons, 0)) as five_year_ago,
       round(((sum(if(year=@current_year, oilseeds_production_1000_tons, 0)) -
               sum(if(year=@ago_5, oilseeds_production_1000_tons, 0))) /
               sum(if(year=@ago_5, oilseeds_production_1000_tons, 0))) * 100, 2) as growth_rate
from agri_data
group by state_name
order by growth_rate desc
limit 5;
```

**Output:**

state_name	current_year	five_year_ago	growth_rate
Andhra Pradesh	2876.520	2242.260	28.29
Haryana	1134.700	899.100	26.20
Orissa	535.340	698.570	-23.37
Jharkhand	0.000	32.130	-100.00
Madhya Pradesh	0.000	7107.740	-100.00

## 4.District-wise correlation between area and production

**Query:**

```
select dist_name, rice_area_1000_ha, rice_production_1000_tons, rice_yield_kg_per_ha,  
wheat_area_1000_ha, wheat_production_1000_tons, wheat_yield_kg_per_ha,  
maize_area_1000_ha, maize_production_1000_tons, maize_yield_kg_per_ha  
from agri_data;
```

**Sample Output:**

dist_name	rice_area_1000_ha	rice_production_1000_tons	rice_yield_kg_per_ha	wheat_area_1000_ha	wheat_production_1000_tons	wheat_yield_kg_per_ha	maize_area_1000_ha	maize_production_1000_tons	maize_yield_kg_per_ha
Durg	548.000	185.000	337.590	44.000	20.000	454.550	3.000	2.000	666.670
Durg	547.000	409.000	747.710	50.000	26.000	520.000	3.000	3.000	1000.000
Durg	556.300	468.000	841.270	53.700	30.000	558.660	2.800	2.000	714.290
Durg	563.400	400.800	711.400	49.400	26.500	536.440	2.700	2.300	851.850
Durg	571.600	473.600	828.550	44.200	29.000	656.110	2.500	3.300	1320.000
Durg	581.800	412.900	709.690	44.400	25.800	581.080	2.700	3.100	1146.150
Durg	582.200	381.000	654.410	39.600	20.600	520.200	2.800	3.200	1142.860
Durg	600.000	471.900	786.500	37.300	18.600	498.660	2.900	2.700	931.030
Durg	587.400	219.000	372.830	36.500	22.400	613.700	2.900	2.900	1000.000
Durg	598.300	454.000	758.820	49.200	27.800	565.040	2.900	2.900	1000.000
Durg	593.600	327.100	551.040	46.900	10.000	213.220	3.000	2.000	666.670
Durg	600.700	572.400	952.890	53.100	27.100	510.360	3.400	2.800	823.530
Durg	612.500	362.200	591.350	48.700	25.600	525.670	3.400	2.900	852.940
Durg	616.800	330.600	535.990	44.600	17.800	399.100	3.000	3.600	1200.000
Durg	634.900	515.600	812.100	44.100	33.600	761.900	3.000	2.800	933.330
Durg	630.000	506.900	804.600	41.500	23.600	568.670	3.000	3.000	1000.000
Durg	627.900	513.300	817.490	41.100	23.900	581.510	3.000	3.100	1033.330
Durg	626.700	711.000	1134.510	39.900	20.600	516.290	3.000	3.700	1233.330
Durg	632.200	563.800	891.810	40.500	19.900	491.360	3.600	4.100	1138.890
Durg	630.800	699.800	1109.380	39.400	21.000	532.990	3.800	3.000	789.470
Durg	643.000	525.000	816.490	37.000	24.000	648.650	4.000	3.000	750.000
Durg	648.000	523.000	807.100	43.000	23.000	534.880	4.000	3.000	750.000
Durg	652.700	549.700	842.190	43.700	20.200	462.240	3.800	4.000	1052.630
Durg	660.200	457.300	692.670	43.800	22.700	518.260	3.700	4.800	1297.300

## 5. Yearly production growth of cotton in top 5 producing states

**Query:**

```
select a.state_name, a.year, sum(a.cotton_production_1000_tons) as cotton_production,  
sum(a.cotton_production_1000_tons)-lag(sum(a.cotton_production_1000_tons)) over(partition by  
a.state_name order by a.year) as growth_rate  
  
from agri_data a  
  
join(  
  
select state_name from agri_data  
  
group by state_name  
  
order by sum(cotton_production_1000_tons) desc  
  
limit 5) t  
  
on a.state_name = t.state_name  
  
group by a.state_name, a.year  
  
order by a.state_name, a.year;
```

**Sample Output:**

state_name	year	cotton_production	growth_rate
Gujarat	1966	252.000	NULL
Gujarat	1967	271.000	19.000
Gujarat	1968	264.000	-7.000
Gujarat	1969	295.300	31.300
Gujarat	1970	323.900	28.600
Gujarat	1971	451.400	127.500

## 6.districts with the highest groundnut production in 2017

**Query:**

```
select dist_name, sum(groundnut_production_1000_tons) as groundnut_production  
from agri_data  
where year = 2017  
group by dist_name  
order by groundnut_production desc  
limit 7;
```

**Output:**

dist_name	groundnut_production
Jamnagar	977.650
Junagadh	945.490
Rajkot	873.870
Bikaner	514.090
Ananthapur	454.940
Banaskantha	288.210
North Arcot / Vellore	280.510

## 7.Annual average maize yield across all states

*Query:*

```
select year, round(avg(maize_yield_kg_per_ha),2) as avg_maize_yield  
from agri_data  
group by year  
order by year;
```

*Sample Output:*

year	avg_maize_yield
1966	734.27
1967	869.54
1968	709.26
1969	781.48
1970	1094.18
1971	848.64
1972	895.13
1973	886.84
1974	852.94
1975	1026.01
1976	966.65
1977	946.53
1978	964.88
1979	984.16
1980	1067.09
1981	1119.51
1982	1189.24
1983	1314.56

## 8.Total area cultivated for oilseeds in each state

**Query:**

```
select state_name, sum(oilseeds_area_1000_ha) as total_oilseeds_area  
from agri_data  
group by state_name  
order by total_oilseeds_area desc;
```

**Output:**

state_name	total_oilseeds_area
Madhya Pradesh	189945.920
Rajasthan	142433.470
Maharashtra	134069.160
Gujarat	130724.710
Karnataka	92527.230
Andhra Pradesh	87223.490
Tamil Nadu	56225.640
Uttar Pradesh	43047.070
Orissa	39682.050
Telangana	35293.430
Kerala	34348.940
Haryana	21465.540
West Bengal	20300.760
Chhattisgarh	17267.080
Assam	14176.640
Punjab	8697.930
Bihar	5536.290
Jharkhand	2826.290
Uttarakhand	993.530
Himachal Pradesh	799.250

## 9.Districts with the highest rice yield

*Query:*

```
select dist_name, avg(rice_yield_kg_per_ha) as rice_yield  
from agri_data  
group by dist_name  
order by rice_yield desc  
limit 10;
```

*Output:*

dist_name	rice_yield
Ludhiana	3650.4340385
Sangrur	3532.8967308
Thirunelveli	3387.5055769
Bhatinda	3363.1588462
Madurai	3276.9823077
Kanyakumari	3240.6934615
Ferozpur	3234.0561538
Patiala	3222.1300000
Jalandhar	3187.0276923
Salem	3102.5834615

## 10. Compare wheat & rice production for top 5 states over 10 years

**Query:**

```
select a.year, a.state_name, sum(a.rice_production_1000_tons) as rice_prod,  
sum(a.wheat_production_1000_tons) as wheat_prod from agri_data a  
  
join(select state_name, sum(rice_production_1000_tons) + sum(wheat_production_1000_tons) as total  
from agri_data  
  
where year between (select max(year) - 9 from agri_data) and (select max(year) from agri_data) group by  
state_name order by total desc limit 5) t  
  
on a.state_name = t.state_name  
  
where a.year between (select max(year) - 9 from agri_data) and (select max(year) from agri_data)  
group by a.year, a.state_name  
  
ORDER BY a.year, wheat_prod desc;
```

**Sample Output:**

year	state_name	rice_prod	wheat_prod
2008	Uttar Pradesh	13080.930	29110.930
2008	Punjab	11000.000	15733.000
2008	Haryana	3299.000	11360.000
2008	Madhya Pradesh	1036.930	7272.200
2008	West Bengal	15037.300	764.500
2009	Uttar Pradesh	11840.150	27910.800
2009	Punjab	11236.000	15169.000
2009	Haryana	3628.000	10488.000
2009	Madhya Pradesh	1355.600	8865.300
2009	West Bengal	14340.600	846.700
2010	Uttar Pradesh	12363.540	30602.910
2010	Punjab	10819.000	16472.000
2010	Haryana	3465.000	11578.000
2010	Madhya Pradesh	1766.600	9219.800
2010	West Bengal	13389.620	874.420
2011	Uttar Pradesh	13949.630	32271.690
2011	Punjab	10542.000	17782.000
2011	Haryana	3757.000	13119.000
2011	Madhya Pradesh	2220.400	12226.240
2011	West Bengal	14610.280	872.900