# DAX in Power BI - Detailed Notes

## 1. DAX Kya Hota Hai?

DAX ka full form hai: Data Analysis Expressions. Ye ek formula language hai jo Power BI, Power Pivot aur SSAS (SQL Server Analysis Services) mein use hoti hai. DAX ka main purpose hota hai calculated columns, measures aur queries ke through data analysis karna.

## 2. DAX Formulas vs DAX Queries vs Parameters vs Measures

* 🔹 DAX Formulas:

Ye woh expressions hote hain jo tum calculated columns ya measures mein likhti ho. Jaise Excel mein formulas likhte ho, waise hi yahan likhe jaate hain.

* 🔹 DAX Queries:

Ye advance level ke DAX statements hote hain jo tabular data return karte hain, jaise SQL queries. Generally DAX Studio ya advanced modeling ke liye use hoti hain.

* 🔹 Parameters:

Power BI mein Parameters use hote hain user inputs ya dynamic filtering ke liye. Ye DAX ka part directly nahi hote, lekin queries ko modify karne mein madadgar hote hain.

* 🔹 Measures:

Measures ek tarah ke calculated fields hote hain jo aggregation karte hain (SUM, AVERAGE, COUNT). Ye report refresh hone par calculate hote hain aur visuals mein use kiye jaate hain.

## 3. DAX Formulas vs Excel Formulas

✅ Similarities:  
- Dono formulas functions based hote hain  
- Syntax similar hota hai (IF, SUM, AVERAGE, etc.)  
  
❌ Differences:  
- Excel har row individually calculate karta hai, jabki DAX filter context ke hisaab se aggregate karta hai  
- DAX mein context important hota hai: Row Context, Filter Context  
- DAX relational model pe kaam karta hai using relationships

## 4. Kab aur Kyun DAX use karte hain?

DAX use karte hain jab tumhe apne data ka analysis karna hota hai beyond basic visuals. Jaise:  
- Custom calculations (Year to Date, Running Total, etc.)  
- Dynamic filters  
- Business KPIs  
- Advanced logic (e.g. Top N, RANKX, CALCULATE)

## 5. Measures vs Calculated Columns

🟢 Measures:  
- Visuals ke saath dynamically calculate hote hain  
- Aggregation ke liye use hote hain  
- Fast & optimized

🔵 Calculated Columns:  
- Data load time par calculate hote hain  
- Row-wise calculation hoti hai  
- Memory zyada lete hain