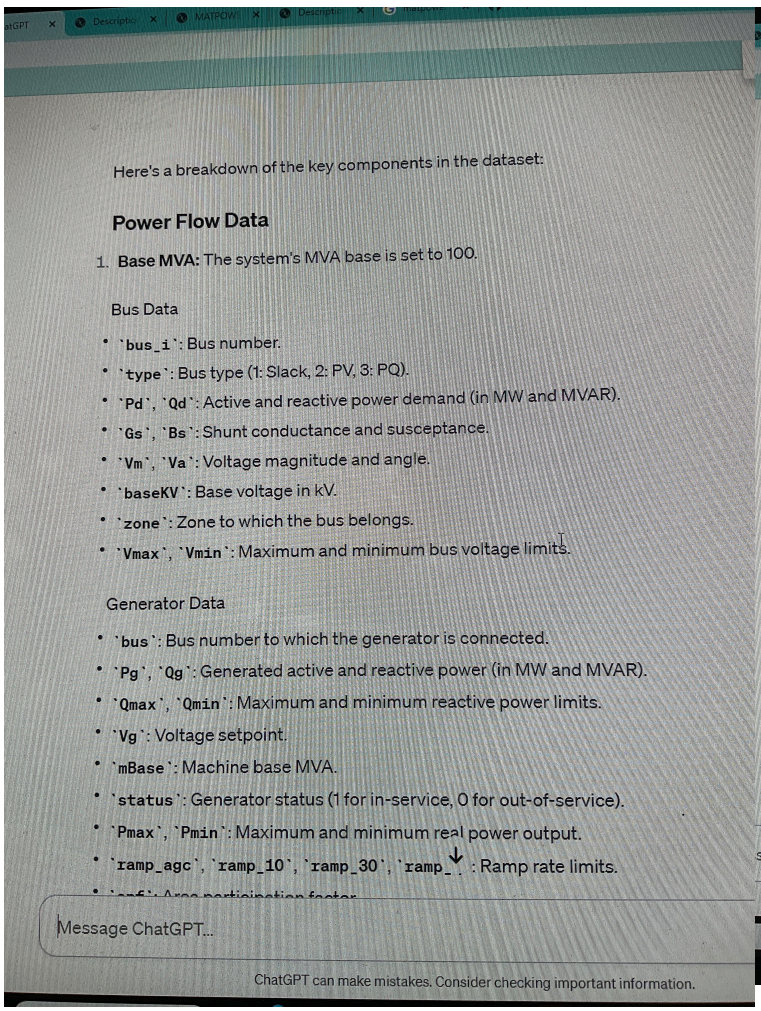
MATPOWER

Cases dataset

9 bus x 5 gen system



Here's a breakdown of the key components in the dataset:

Power Flow Data

1. **Base MVA:** The system's MVA base is set to 100.

Bus Data

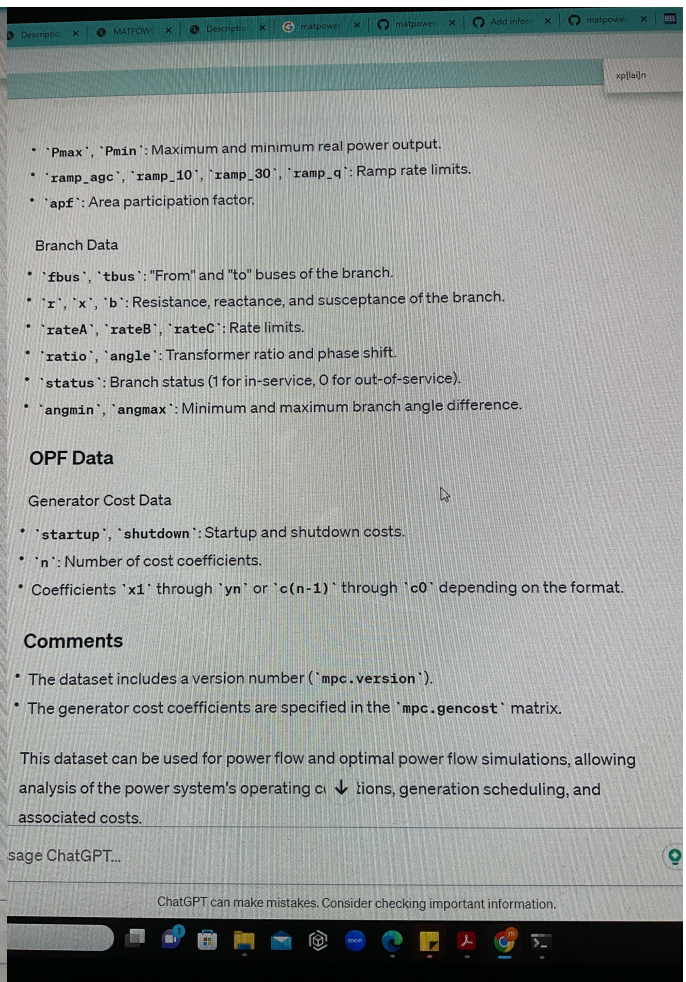
- `bus_i`: Bus number.
- `type`: Bus type (1: Slack, 2: PV, 3: PQ).
- `Pd`, `Qd`: Active and reactive power demand (in MW and MVAR).
- `Gs`, `Bs`: Shunt conductance and susceptance.
- `Vm`, `Va`: Voltage magnitude and angle.
- `baseKV`: Base voltage in kV.
- `zone`: Zone to which the bus belongs.
- `Vmax`, `Vmin`: Maximum and minimum bus voltage limits.

Generator Data

- `bus`: Bus number to which the generator is connected.
- `Pg`, `Qg`: Generated active and reactive power (in MW and MVAR).
- `Qmax`, `Qmin`: Maximum and minimum reactive power limits.
- `Vg`: Voltage setpoint.
- `mBase`: Machine base MVA.
- `status`: Generator status (1 for in-service, 0 for out-of-service).
- `Pmax`, `Pmin`: Maximum and minimum real power output.
- `ramp_agc`, `ramp_10`, `ramp_30`, `ramp_`: Ramp rate limits.

Message ChatGPT...

ChatGPT can make mistakes. Consider checking important information.



- `Pmax`, `Pmin`: Maximum and minimum real power output.
- `ramp_agc`, `ramp_10`, `ramp_30`, `ramp_q`: Ramp rate limits.
- `apf`: Area participation factor.

Branch Data

- `fbus`, `tbus`: "From" and "to" buses of the branch.
- `r`, `x`, `b`: Resistance, reactance, and susceptance of the branch.
- `rateA`, `rateB`, `rateC`: Rate limits.
- `ratio`, `angle`: Transformer ratio and phase shift.
- `status`: Branch status (1 for in-service, 0 for out-of-service).
- `angmin`, `angmax`: Minimum and maximum branch angle difference.

OPF Data

Generator Cost Data

- `startup`, `shutdown`: Startup and shutdown costs.
- `n`: Number of cost coefficients.
- Coefficients `x1` through `yn` or `c(n-1)` through `c0` depending on the format.

Comments

- The dataset includes a version number (`mpc.version`).
- The generator cost coefficients are specified in the `mpc.gencost` matrix.

This dataset can be used for power flow and optimal power flow simulations, allowing analysis of the power system's operating c ↓ tions, generation scheduling, and associated costs.

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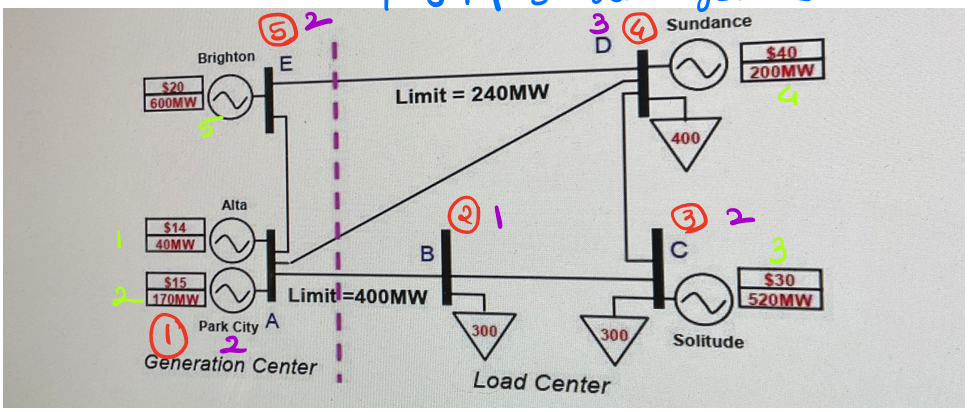
Bus types:

① Slack bus
- → Ref bus
- → Vm, θ specified constant
- → gen that sets system freq.

② PV bus
- → generator bus
- → Vm and Pg specified constant
- → vary reactive power

③ PQ bus
- → load bus
- → Pg and Qg specified
- → Vm & θ vary to meet demand

PJM 5-bus System



- bus i
- bus type
- gen i

bus_indices = [5 4 2 3 1]

for i = 1:5

VM[5] = Vm_values(5)

VM[4] = Vmvalues(4)