02. Case Format

Edit | New Page

Jump to bottom

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bus.csv (buses):

id	name	kind	baseKV	Vm	Va	area	zone	locX	locY
100001	CHESTER SVC	PQ	345.00	1.03499	20.55	ISO-NE	ME_MEPCO_P		
100002	ORRINGTON	PQ	345.00	1.02621	17.66	ISO-NE	ME_MEPCO_P		
100004	S3023SCAP	PQ	345.00	1.03044	19.25	ISO-NE	ME_MEPCO_P		

- id => integer identifier
- name => name
- kind => RE: reference bus; PV: generator bus (given P & V); PQ: regular bus (given P & Q)
- baseKV => base voltage (kV)
- Vm => voltage magnitude (pu) [initial guess]
- Va => voltage angle (degrees) [initial guess]
- area => area name
- zone => zone name
- locX => X location
- locY => Y location

branch.csv (branches):

id	f	t	f_name	t_name	kind	status	R	X	B	tap	shift	Pf_min	Pf_max	Qf_min	Qf_max	tap_min	tap_max	rateA	rateB	rateC	bus_reg
1	100001	103001	CHESTER SVC	KEENE ROAD	TR_LINE	1	0.00001	0.00009	0.00135	1.00000	0.00							2141.0	2141.0	2348.0	
2	100002	100004	ORRINGTON	S3023SCAP	TR_LINE	0	0.00000	0.00010	0.00000	1.00000	0.00							1866.0	1888.0	2232.0	
3	100002	100004	ORRINGTON	S3023SCAP	TR_LINE	1	0.00000	-0.01875	0.00000	1.00000	0.00							1494.0	1494.0	1494.0	

- id => integer identifier
- f => id of the *from* bus
- t => id of the *to* bus
- f_name => name of the *from* bus
- t_name => name of the *to* bus

- kind => TR_LINE: transmission line; FT_XFMR: fixed-tap transformer; CTRL_V: variable-tap transformer (V regulated at `bus_reg`); CTRL_P: phase-shifting transformer (branch active-power flow regulated); CTRL_Q: variable-tap transformer (branch reactive-power flow regulated)
- status => 0: out of service; 1: in service
- R => resistance (pu)
- X => reactance (pu)
- B => line-charging susceptance (pu)
- tap => tap ratio
- shift => phase shift (degrees)
- Pf_min => minimum active-power flow (MVA) for CTRL_P branches
- Pf_max => maximum active-power flow (MVA) for CTRL_P branches
- Qf_min => minimum reactive-power flow (MVA) for CTRL_Q branches
- Qf_max => maximum reactive-power flow (MVA) for CTRL_Q branches
- tap_min => minimum tap ratio for CTRL_V branches
- tap_max => maximum tap ratio for CTRL_V branches
- rateA => long-term rating (MVA)
- rateB => short-term rating (MVA)
- rateC => emergency rating (MVA)
- bus_reg => id of the regulated bus for CTRL_V branches

gen.csv (generators):

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	id	bus	name	P	Q	status	Vsp	Pmin	Pmax	Qmin	Qmax	dispatch	Cost0	Cost1	kind
2	1	100351	KIBBY STRNG1	39.00	8.24	1	1.04350	0.30	39.00	-1.21	8.33	cost	0	0	WIND
3	2	100352	KIBBY STRNG2	27.00	5.77	1	1.04350	0.20	27.00	-0.84	5.77	cost	0	0	WIND
4	3	100353	KIBBY STRNG3	39.00	8.33	1	1.04350	0.30	39.00	-1.21	8.33	cost	0	0	WIND

- id => integer identifier
- bus => parent-bus id of the generator
- name => name
- P => given active-power (MW)
- Q => given reactive-power (MVAr)
- status => 0: out of service; 1: in service
- Vsp => voltage setpoint (pu)
- Pmin => minimum active-power (MW) [not used by `run acpf`]

- Pmax => maximum active-power (MW)
- Qmin => minimum reactive-power (MVAr)
- Qmax => maximum reactive-power (MVAr)
- dispatch => `cost` (economic dispatch) or `proportional` (prespecified dispatch) [not used by `run_acpf`]
- Cost0 => operating cost ($/MWh) [not used by `run_acpf`]
- Cost1 => startup cost ($/MWh) [not used by `run_acpf`]
- kind => generator type (e.g., SOLAR) [not used by `run_acpf`]

shunt.csv (loads and fixed/variable reactive resources):

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	id	bus	name	kind	P	Q	status	Qmin	Qmax	Vsp	fracS	fracY	bus_reg
2	1	100101	RUMFORD	LOAD	-1.32	0.03	1	0.00	0.00		1.00	0.00	100101
3	2	100101	RUMFORD	LOAD	-1.23	0.03	1	0.00	0.00		1.00	0.00	100101
4	3	100101	RUMFORD	LOAD	12.26	-0.30	1	0.00	0.00		1.00	0.00	100101

- id => integer identifier
- bus => parent-bus id of the load/shunt
- name => name
- kind => LOAD: standard load (given P & Q); FIXED: fixed shunt (P=0 & *given* Q at V_pu=1); CTRL_V: switched shunt (P=0 & *variable* Q at V_pu=1)
- P => active-power demand (MW)
- Q => reactive-power demand (MVAr)
- status => 0: out of service; 1: in service
- Qmin => minimum reactive-power (MVAr) [applicable only to fixed/switched shunts]
- Qmax => maximum reactive-power (MVAr) [applicable only to fixed/switched shunts]
- Vsp => voltage magnitude setpoint (pu) [applicable only to switched shunts]
- fracS => fraction (0-1) of the demand that's at constant power
- fracY => fraction (0-1) of the demand that's at constant admittance
- bus_reg => id of the regulated bus for fixed/switched shunts

Sign convention for loads/shunts:

- `kind = LOAD / FIXED` => positive means *consumption*; negative means *injection*

- `kind = CTRL_V` => positive means *injection*; negative means *consumption*

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