sPHENIX INTT - calibration database PSQL

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From sheet to PSQL

4 tables to save the calibration-test information of barrel.

B0L0 | B0L1 | B1L0 | B1L1

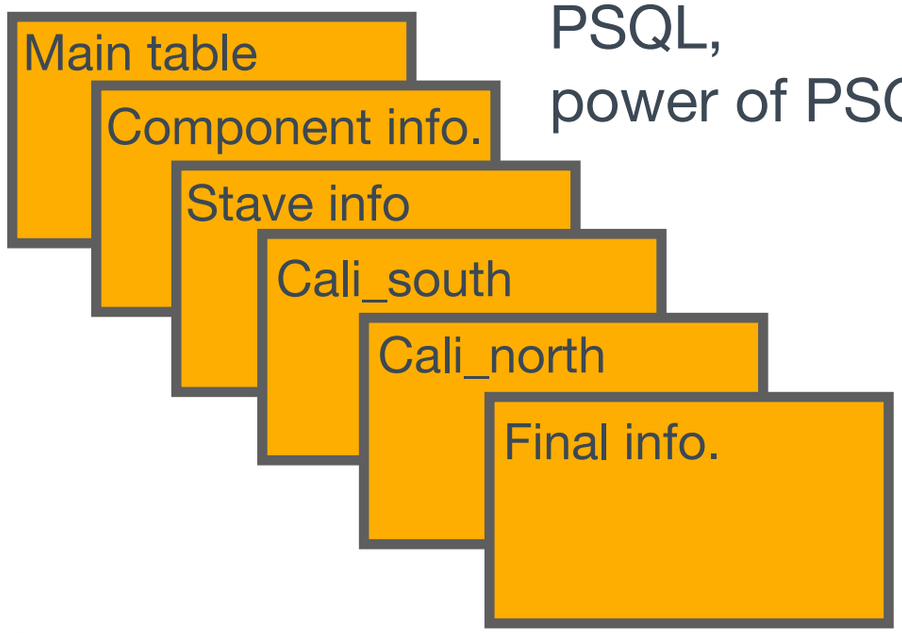
B0L0			Hardware Componenents			Calibration Test								Survey, Cooling, and Grounding						Final		
						South				North												
	ID	Ladder Position	Ladder Name	HDI South/North	BEX South/North	Current SA/SB [nA]	TA/TB [Celsius]	File Name	Status	Current SA/SB [nA]	TA/TB [Celsius]	File Name	Status	Survey Status	GND Wire Stave	Glue TC Connector	Cooling Test	Silver Epoxy	Grounding Confirmed	Conversion Cable S/N	Pulse Test	Barrel Status
1	EAST	B0L000	PB1-L008	201/202	028/025	400/200	22.6/23.0	20220822-1822,5	1	355/400	23.5/22.6	20220823-1253,6	1	1	1	1	1	1	1			
2		B0L001	PB1-L005	038/039	026/023	407/359	23.1/22.9	20220818-1643,8	1	360/410	22.7/22.3	20220823-1326,6	1	1	1	1	1	1	1			
3		B0L002	PB1-L031	281/288	004/003	402/340	23.0/23.0	20220818-1628,8	1	342/358	22.3/22.0	20220823-1410,8	1	1	1	1	1	1	1			
4		B0L003	PB1-L013	217/218	018/019	400/310	22.7/34.2	20220812-1709,8	1	274/299	22.5/22.0	20220811-1127,8	1	1	1	1	1	1	1			
5		B0L004	PB1-L027	279/280	022/005	400/370	22.6/22.3	20220822-1607,8	1	404/376	21.3/21.3	20220823-1452,8	1	1	1	1	1	1	1			
6		B0L005	PB1-L009	199/200	024/021	391/364	22.3/21.9	20220822-1720,6	1	419/358	23.1/22.6	20220823-1538,8	1	1	1	1	1	1	1			
7	WEST	B0L006	PB1-L034	302/307	016/017	354/313	23.6/-7.2	20220812-1825,8	1	221/276	22.5/22.0	20220811-1251,8	1	1	1	1	1	1	1			
8		B0L007	PB1-L020	282/283	014/015	391/370	22.7/22.3	20220812-1736,8	1	92/240	22.7/22.1	20220811-1229,8	1	1	1	1	1	1	1			
9		B0L008	PB1-L017	213/214	010/011	391/376	22.5/22.1	20220812-1722,8	1	411/299	22.6/21.7	20220811-1143,8	1	1	1	1	1	1	1			
10		B0L009	PB1-L010	197/198	006/007	368/347	23.4/23.0	20220818-1710,8	1	387/350	23.4/22.8	20220823-1426,8	1	1	1	1	1	1	1			
11		B0L010	PB1-L006	040/206	008/009	393/369	21.3/21.5	20220812-1703,8	1	276/249	23.2/22.6	20220811-1103,8	1	1	1	1	1	1	1			
12		B0L011	PB1-L021	284/285	012/013	374/381	23.1/22.9	20220816-1634,8	1	369/297	23.1/22.4	20220811-1035,8	1	1	1	1	1	1	1			

The information is kept in google spreadsheet.

Goal : save the data in the Postgresql (psql)

Google spreadsheet

Ladder info.
Component info.
Cali_south
Cali_north
Stave info.
Final info.



PSQL,
power of PSQL : relation

From sheet to PSQL - procedures

B0L0			Hardware Componenents			Calibration Test							
						South				North			
	ID	Ladder Position	Ladder Name	HDI South/North	BEX South/North	Current SA/SB [nA]	TA/TB [Celsius]	File Name	Status	Current SA/SB [nA]	TA/TB [Celsius]	File Name	Status
1	EAST	B0L000	PB1-L008	201/202	028/025	400/200	22.6/23.0	20220822-1822,5	1	355/400	23.5/22.6	20220823-1253,6	1
2		B0L001	PB1-L005	038/039	026/023	407/359	23.1/22.9	20220818-1643,8	1	360/410	22.7/22.3	20220823-1326,6	1
3		B0L002	PB1-L031	281/288	004/003	402/340	23.0/23.0	20220818-1628,8	1	342/358	22.3/22.0	20220823-1410,8	1
4		B0L003	PB1-L013	217/218	018/019	400/310	22.7/34.2	20220812-1709,8	1	274/299	22.5/22.0	20220811-1127,8	1
5		B0L004	PB1-L027	279/280	022/005	400/370	22.6/22.3	20220822-1607,8	1	404/376	21.3/21.3	20220823-1452,8	1
6		B0L005	PB1-L009	199/200	024/021	391/364	22.3/21.9	20220822-1720,6	1	419/358	23.1/22.6	20220823-1538,8	1
7	WEST	B0L006	PB1-L034	302/307	016/017	354/313	23.6/-7.2	20220812-1825,8	1	221/276	22.5/22.0	20220811-1251,8	1
8		B0L007	PB1-L020	282/283	014/015	391/370	22.7/22.3	20220812-1736,8	1	92/240	22.7/22.1	20220811-1229,8	1
9		B0L008	PB1-L017	213/214	010/011	391/376	22.5/22.1	20220812-1722,8	1	411/299	22.6/21.7	20220811-1143,8	1
10		B0L009	PB1-L010	197/198	006/007	368/347	23.4/23.0	20220818-1710,8	1	387/350	23.4/22.8	20220823-1426,8	1
11		B0L010	PB1-L006	040/206	008/009	393/369	21.3/21.5	20220812-1703,8	1	276/249	23.2/22.6	20220811-1103,8	1
12		B0L011	PB1-L021	284/285	012/013	374/381	23.1/22.9	20220816-1634,8	1	369/297	23.1/22.4	20220811-1035,8	1

Request the information via google sheet API.

Python → Re-organize the information → Fill the information to PSQL via the package psycopg2. → PSQL

Advantages :

1. All can be done in python
2. Easy to update

Practice status - table list

In PSQL

Location of psql server : my mac (for practice)

```
intt_calibration_db_test=# \d
                  List of relations
 Schema |          Name           |   Type   |     Owner
--------+-------------------------+----------+-------------
 public | cali_north_info         | table    | chengweishi
 public | cali_north_info_id_seq  | sequence | chengweishi
 public | cali_south_info         | table    | chengweishi
 public | cali_south_info_id_seq  | sequence | chengweishi
 public | component_info          | table    | chengweishi
 public | component_info_id_seq   | sequence | chengweishi
 public | main_table              | table    | chengweishi
 public | main_table_id_seq       | sequence | chengweishi
 public | stave_info              | table    | chengweishi
 public | stave_info_id_seq       | sequence | chengweishi
```

The information is separated into five tables

Practice status - contents of tables

In PSQL

Calibration result - south

```
intt_calibration_db_test=# select * from cali_south_info;
 id | calibration_south_current_a | calibration_south_current_b | calibration_south_ta | calibration_south_tb | calibration_south_file_name | calibration_south_moduleid | calibration_south_status
----+-----------------------------+-----------------------------+----------------------+----------------------+-----------------------------+----------------------------+-------------------------
  1 |                       359.0 |                       341.0 |                 22.8 |                 22.6 | 20220826-1249               |                          8 |                       1
  2 |                       387.0 |                       361.0 |                 21.9 |                 21.6 | 20220822-1750               |                          8 |                       1
  3 |                       410.0 |                       362.0 |                 22.2 |                 22.1 | 20220816-1741               |                          8 |                       1
  4 |                       200.0 |                       370.0 |                 23.1 |                 -5.2 | 20220822-1843               |                          8 |                       1
  5 |                       297.0 |                       291.0 |                 23.3 |                -17.6 | 20220817-1526               |                          8 |                       1
  6 |                       407.0 |                       362.0 |                 22.6 |                 22.3 | 20220818-1813               |                          8 |                       1
  7 |                       370.0 |                       279.0 |                 22.8 |                 22.5 | 20220822-1540               |                          8 |                       1
  8 |                       382.0 |                       385.0 |                 22.8 |                 22.6 | 20220822-1718               |                          6 |                       1
  9 |                       373.0 |                       354.0 |                 23.5 |                 23.2 | 20220812-1851               |                          8 |                       1
 10 |                       395.0 |                       365.0 |                 22.3 |                 22.2 | 20220812-1808               |                          8 |                       1
 11 |                       394.0 |                       271.0 |                 23.3 |                  4.2 | 20220810-1348               |                          8 |                       1
 12 |                       394.0 |                       371.0 |                 23.3 |                -13.8 | 20220811-1048               |                          8 |                       1
 13 |                       374.0 |                       385.0 |                 23.3 |                 -7.5 | 20220812-1111               |                          8 |                       1
 14 |                        13.0 |                       342.0 |                 23.1 |                 22.9 | 20220826-1737               |                          8 |                       1
 15 |                       383.0 |                       395.0 |                 23.2 |                 22.8 | 20220816-1620               |                          8 |                       1
 16 |                       358.0 |                       376.0 |                 23.5 |                 23.8 | 20220816-1613               |                          8 |                       1
(16 rows)
```

Calibration result - north

```
intt_calibration_db_test=# select * from cali_north_info;
 id | calibration_north_current_a | calibration_north_current_b | calibration_north_ta | calibration_north_tb | calibration_north_file_name | calibration_north_moduleid | calibration_north_status
----+-----------------------------+-----------------------------+----------------------+----------------------+-----------------------------+----------------------------+-------------------------
  1 |                       359.0 |                       341.0 |                 22.8 |                 22.6 | 20220826-1249               |                          8 |                       1
  2 |                       396.0 |                       360.0 |                 22.6 |                 22.0 | 20220823-1352               |                          8 |                       1
  3 |                       380.0 |                       230.0 |                 22.0 |                 22.9 | 20220823-1357               |                          8 |                       1
  4 |                       400.0 |                       350.0 |                 21.4 |                 21.5 | 20220823-1416               |                          8 |                       1
  5 |                       391.0 |                       362.0 |                 23.6 |                 38.1 | 20220823-1438               |                          8 |                       1
  6 |                       407.0 |                        30.0 |                 23.3 |                 22.6 | 20220823-1506               |                          8 |                       1
  7 |                       407.0 |                       376.0 |                 22.9 |                 22.2 | 20220823-1527               |                          8 |                       1
  8 |                       362.0 |                       350.0 |                 22.7 |                 22.2 | 20220823-1520               |                          8 |                       1
  9 |                       299.0 |                       295.0 |                 23.2 |                 22.6 | 20220810-1809               |                          8 |                       1
 10 |                       410.0 |                       292.0 |                 23.3 |                 22.7 | 20220810-1800               |                          8 |                       1
 11 |                       416.0 |                       301.0 |                 21.0 |                -14.8 | 20220810-1656               |                          6 |                       1
 12 |                       427.0 |                       297.0 |                 23.3 |                -13.8 | 20220810-1638               |                          6 |                       1
 13 |                       416.0 |                       299.0 |                 23.2 |                -16.6 | 20220810-1718               |                          6 |                       1
 14 |                       290.0 |                       297.0 |                 23.1 |                 22.3 | 20220810-1732               |                          6 |                       1
 15 |                      -402.0 |                      -262.0 |                 23.3 |                -10.6 | 20220810-1824               |                          8 |                       1
 16 |                       257.0 |                       260.0 |                 23.1 |                 22.1 | 20220810-1834               |                          8 |                       1
```

Practice status - contents of tables

In PSQL

Stave information

```
intt_calibration_db_test=# select * from stave_info;
 id | stave_survey_status | stave_gnd_wire_stave | stave_glue_tc_connect | stave_cooling_test | stave_silver_epoxy | stave_grounding_confirmed
----+---------------------+----------------------+-----------------------+--------------------+--------------------+---------------------------
  1 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
  2 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
  3 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
  4 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
  5 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
  6 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
  7 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
  8 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
  9 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
 10 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
 11 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
 12 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
 13 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
 14 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
 15 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
 16 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
(16 rows)
```

Component information (HDI ID & BEX ID)

Coaxial cable ID in the future

```
intt_calibration_db_test=# select * from component_info;
 id | hdi_south | hdi_north | bex_south | bex_north
----+-----------+-----------+-----------+-----------
  1 | 242       | 243       | 67        | 70
  2 | 149       | 150       | 69        | 72
  3 | 310       | 311       | 71        | 74
  4 | 374       | 375       | 73        | 76
  5 | 366       | 367       | 75        | 78
  6 | 017       | 018       | 77        | 80
  7 | 194       | 195       | 79        | 82
  8 | 291       | 292       | 81        | 84
  9 | 293       | 294       | 51        | 54
 10 | 232       | 233       | 53        | 56
 11 | 187       | 188       | 55        | 58
 12 | 226       | 227       | 57        | 60
 13 | 228       | 229       | 59        | 62
 14 | 386       | 387       | 61        | 64
 15 | 303       | 304       | 63        | 66
 16 | 300       | 301       | 65        | 68
(16 rows)
```

Practice status - contents of tables

In PSQL

Main table

id	barrel_id	ladder_position	ladder_name	component_id	stave_id	cali_south_id	cali_north_id
1	EAST	B1L000	PB2-L016	1	1	1	1
2	EAST	B1L001	PB2-L020	2	2	2	2
3	EAST	B1L002	PB2-L034	3	3	3	3
4	EAST	B1L003	PB2-L049	4	4	4	4
5	EAST	B1L004	PB2-L045	5	5	5	5
6	EAST	B1L005	PB2-L001	6	6	6	6
7	EAST	B1L006	PB2-L018	7	7	7	7
8	EAST	B1L007	PB2-L026	8	8	8	8
9	WEST	B1L008	PB2-L027	9	9	9	9
10	WEST	B1L009	PB2-L011	10	10	10	10
11	WEST	B1L010	PB2-L031	11	11	11	11
12	WEST	B1L011	PB2-L008	12	12	12	12
13	WEST	B1L012	PB2-L009	13	13	13	13
14	WEST	B1L013	PB2-L038	14	14	14	14
15	WEST	B1L014	PB2-L032	15	15	15	15
16	WEST	B1L015	PB2-L030	16	16	16	16

(16 rows)

Foreign keys

Practice status - contents of tables

In PSQL

Call the relations by using the inner join command.

```
SELECT * FROM main_table JOIN component_info ON main_table.component_id = component_info.id;
```

```
intt_calibration_db_test=# select * from main_table join component_info ON main_table.component_id = component_info.id;
 id | barrel_id | ladder_position | ladder_name | component_id | stave_id | cali_south_id | cali_north_id | id | hdi_south | hdi_north | bex_south | bex_north
----+-----------+-----------------+-------------+--------------+----------+---------------+---------------+----+-----------+-----------+-----------+-----------
  1 | EAST      | B1L000          | PB2-L016    |            1 |        1 |             1 |             1 |  1 | 242       | 243       | 67        | 70
  2 | EAST      | B1L001          | PB2-L020    |            2 |        2 |             2 |             2 |  2 | 149       | 150       | 69        | 72
  3 | EAST      | B1L002          | PB2-L034    |            3 |        3 |             3 |             3 |  3 | 310       | 311       | 71        | 74
  4 | EAST      | B1L003          | PB2-L049    |            4 |        4 |             4 |             4 |  4 | 374       | 375       | 73        | 76
  5 | EAST      | B1L004          | PB2-L045    |            5 |        5 |             5 |             5 |  5 | 366       | 367       | 75        | 78
  6 | EAST      | B1L005          | PB2-L001    |            6 |        6 |             6 |             6 |  6 | 017       | 018       | 77        | 80
  7 | EAST      | B1L006          | PB2-L018    |            7 |        7 |             7 |             7 |  7 | 194       | 195       | 79        | 82
  8 | EAST      | B1L007          | PB2-L026    |            8 |        8 |             8 |             8 |  8 | 291       | 292       | 81        | 84
  9 | WEST      | B1L008          | PB2-L027    |            9 |        9 |             9 |             9 |  9 | 293       | 294       | 51        | 54
 10 | WEST      | B1L009          | PB2-L011    |           10 |       10 |            10 |            10 | 10 | 232       | 233       | 53        | 56
 11 | WEST      | B1L010          | PB2-L031    |           11 |       11 |            11 |            11 | 11 | 187       | 188       | 55        | 58
 12 | WEST      | B1L011          | PB2-L008    |           12 |       12 |            12 |            12 | 12 | 226       | 227       | 57        | 60
 13 | WEST      | B1L012          | PB2-L009    |           13 |       13 |            13 |            13 | 13 | 228       | 229       | 59        | 62
 14 | WEST      | B1L013          | PB2-L038    |           14 |       14 |            14 |            14 | 14 | 386       | 387       | 61        | 64
 15 | WEST      | B1L014          | PB2-L032    |           15 |       15 |            15 |            15 | 15 | 303       | 304       | 63        | 66
 16 | WEST      | B1L015          | PB2-L030    |           16 |       16 |            16 |            16 | 16 | 300       | 301       | 65        | 68
(16 rows)
```

Main table

Component table

Practice status - function

Access the information and plots via single command

```
>>> pp.ladder_info_request(cur,conn,'PB2-L001',False)
```

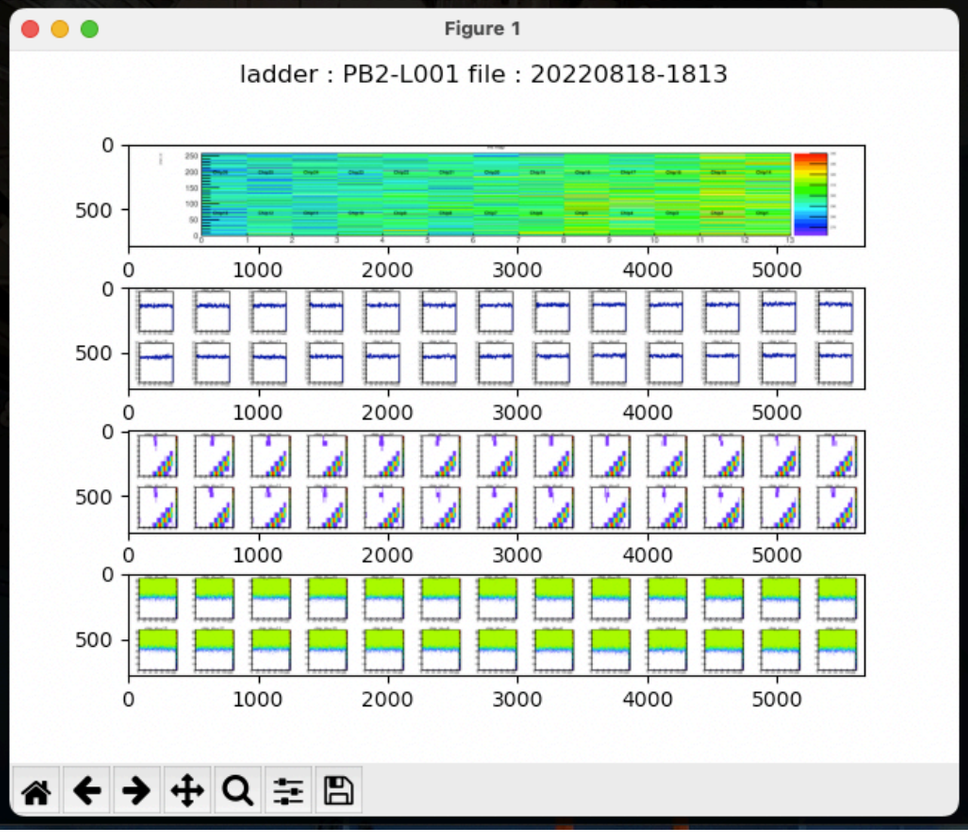
stave_survey_status	stave_gnd_wire_stave	stave_glue_tc_connect	stave_cooling_test	stave_silver_epoxy	stave_grounding_confirmed
1	1	1	1	1	1

calibration_south_current_a	calibration_south_current_b	calibration_south_ta	calibration_south_tb	calibration_south_file_name	calibration_south_moduleid	calibration_south_status
407.0	362.0	22.6	22.3	20220818-1813	8	1

calibration_north_current_a	calibration_north_current_b	calibration_north_ta	calibration_north_tb	calibration_north_file_name	calibration_north_moduleid	calibration_north_status
407.0	30.0	23.3	22.6	20220823-1506	8	1

hdi_south	hdi_north	bex_south	bex_north
017	018	77	80

barrel_id	ladder_position	ladder_name	component_id	stave_id	cali_south_id	cali_north_id
EAST	B1L005	PB2-L001	6	6	6	6



Back up