Weather Database

October 30, 2025

Start Mysql (MariaDB) on pi:

- `sudo mysql -u<id> -p`

Select Database

- `connect weather`

Change Database

- `use <new-db>`

Weather Tracking – 10 minute intervals (readings)

- ```
  CREATE OR REPLACE SEQUENCE cqw
      MINVALUE 0
      MAXVALUE 5000
      START WITH 0
      CYCLE
      COMMENT 'Index for readings';
  ```
- ```
  create table readings (
      id int unsigned not NULL
          DEFAULT NEXT VALUE FOR cqw,
      tmstamp timestamp default current_timestamp on update
  current_timestamp,
      recordType enum('LOCAL','REMOTE') default 'LOCAL',
      tempbmpc decimal(4,1) default 0.0,
      tempbmpf decimal(4,1) default 0.0,
      tempdhtc decimal(4,1) default 0.0,
      tempdhtf decimal(4,1) default 0.0,
      tempCombined decimal(4,1) default 0.0,
      humidity decimal(4,1) default 0.0,
      baromB decimal(6,1) default 1009.3,
      baroinHg decimal(8,3) default 0.0,
      baroVariance decimal(4,1) default 0.0
  );
      COMMENT '5000 rows maximum – slightly over 30 days';
  ```

Remote Weather Tracking – 120 minute intervals (rmt_readings)

- ```
  CREATE OR REPLACE SEQUENCE cqx
      MINVALUE 0
      MAXVALUE 5000
      START WITH 0
      CYCLE
      COMMENT 'Index for rmt_readings';
  ```
- ```
  create table rmt_readings (
      id int unsigned not NULL
          DEFAULT NEXT VALUE FOR cqx,
      tmstamp timestamp default current_timestamp on update
  current_timestamp,
      temprmtf decimal(5,2) default 0.0,
      humidityrmt decimal(4,1) default 0.0,
      baromBrmt decimal(6,1) default 0.0,
      windspeed decimal(4,1) default 0.0,
      winddir decimal(4,1) default 0.0,
      windgust decimal(4,1) default 0.0,
      sunrise timestamp default current_timestamp on update
  current_timestamp,
      sunset timestamp default current_timestamp on update
  current_timestamp
  )
      COMMENT '5000 rows maximum';
  ```

Weather Tracking – current & 24hr min/max readings

- ```
  create table currentreadings (
      id integer primary key,
      tmstamp timestamp default current_timestamp on update
  current_timestamp,
      tempbmpf decimal(4,1) default 0.0,
      minbmpf decimal(4,1) default 0.0,
      maxbmpf decimal(4,1) default 0.0,
      minbmpts timestamp,
      maxbmpts timestamp,
      tempdhtf decimal(4,1) default 0.0,
      mindhtf decimal(4,1) default 0.0,
      maxdhtf decimal(4,1) default 0.0,
      mindhtts timestamp,
      maxdhtts timestamp,
      humidity decimal(4,1) default 0.0,
      minhumidity decimal(4,1) default 0.0,
      maxhumidity decimal(4,1) default 0.0,
      minhumts timestamp,
      maxhumts timestamp,
      baromB decimal(6,1) default 0.0,
      lowmB decimal(6,1) default 0.0,
      highmB decimal(6,1) default 0.0,
      lowmbts timestamp,
      highmbts timestamp
  );
  ```
- ```
  insert into currentreadings (id) values (1);
  ```

Weather Tracking – min/max readings today

- ```
  create table readingsToday (
      id integer primary key,
      tmstamp timestamp default current_timestamp on update
  current_timestamp,
      minTodaybmpf decimal(4,1) default 0.0,
      maxTodaybmpf decimal(4,1) default 0.0,
      minTodaybmpts timestamp,
      maxTodaybmpts timestamp,
      minTodaydhtf decimal(4,1) default 0.0,
      maxTodaydhtf decimal(4,1) default 0.0,
      minTodaydhtts timestamp,
      maxTodaydhtts timestamp,
      minTodayhumidity decimal(4,1) default 0.0,
      maxTodayhumidity decimal(4,1) default 0.0,
      minTodayhumts timestamp,
      maxTodayhumts timestamp,
      lowTodaymB decimal(6,1) default 0.0,
      highTodaymB decimal(6,1) default 0.0,
      lowTodaymbts timestamp,
      highTodaymbts timestamp
  );
  ```
- ```
  insert into readingsToday (id) values (1);
  ```

Weather Tracking – 30 day min/max readings

- ```
  create table readings30 (
      id integer primary key,
      tmstamp timestamp default current_timestamp on update
  current_timestamp,
      min30bmpf decimal(4,1) default 0.0,
      max30bmpf decimal(4,1) default 0.0,
      min30bmpts timestamp,
      max30bmpts timestamp,
      min30dhtf decimal(4,1) default 0.0,
      max30dhtf decimal(4,1) default 0.0,
      min30dhtts timestamp,
      max30dhtts timestamp,
      min30humidity decimal(4,1) default 0.0,
      max30humidity decimal(4,1) default 0.0,
      min30humts timestamp,
      max30humts timestamp,
      low30mB decimal(6,1) default 0.0,
      high30mB decimal(6,1) default 0.0,
      low30mbts timestamp,
      high30mbts timestamp
  );
  ```
- ```
  insert into readings30 (id) values (1);
  ```

Weather Tracking – Month Data min/max

- ```
  create table monthdata (
      id integer primary key,
      month enum ('January','February','March','April',
  'May','June','July','August','September','October','November','December
  '),
      tmstamp timestamp default current_timestamp on update
  current_timestamp,
      mintempfts timestamp,
      mintempf decimal(4,1) default 120.0,
      maxtempfts timestamp,
      maxtempf decimal(4,1) default -50.0,
      minhumts timestamp,
      minhum decimal(4,1) default 100.0,
      maxhumts timestamp,
      maxhum decimal(4,1) default 0.0,
      lowmBts timestamp,
      lowmB decimal(6,1) default 1050.0,
      highmBts timestamp,
      highmB decimal(6,1) default 900.0
  )
      COMMENT '12 rows – 1 row for each month';

  insert into monthdata (id,month) values (1,'January');

  insert into monthdata (id,month) values (2,'February');

  insert into monthdata (id,month) values (3,'March');

  insert into monthdata (id,month) values (4,'April');

  insert into monthdata (id,month) values (5,'May');

  insert into monthdata (id,month) values (6,'June');

  insert into monthdata (id,month) values (7,'July');

  insert into monthdata (id,month) values (8,'August');

  insert into monthdata (id,month) values (9,'September');

  insert into monthdata (id,month) values (10,'October');

  insert into monthdata (id,month) values (11,'November');

  insert into monthdata (id,month) values (12,'December');
  ```

Weather Tracking – Month Data averages
  ```

- ```
  create table monthavg (
      id integer primary key,
      month enum ('January','February','March','April',
  'May','June','July','August','September','October','November','December
  '),
      tmstamp timestamp default current_timestamp on update
  current_timestamp,
      daytally integer default 0,
      avgdaytimetempf decimal(4,1) default 0.0,
      nighttally integer default 0,
      avgnighttimetempf decimal(4,1) default 0.0,
      avghightally integer default 0,
      avghightempf decimal(4,1) default 0.0,
      avglowtally integer default 0,
      avglowtempf decimal(4,1) default 0.0
  )
      COMMENT '13 rows – 1 row/month, 1 for cur mon running avg';

  insert into monthavg (id,month) values (1,'January');

  insert into monthavg (id,month) values (2,'February');

  insert into monthavg (id,month) values (3,'March');

  insert into monthavg (id,month) values (4,'April');

  insert into monthavg (id,month) values (5,'May');

  insert into monthavg (id,month) values (6,'June');

  insert into monthavg (id,month) values (7,'July');

  insert into monthavg (id,month) values (8,'August');

  insert into monthavg (id,month) values (9,'September');

  insert into monthavg (id,month) values (10,'October');

  insert into monthavg (id,month) values (11,'November');

  insert into monthavg (id,month) values (12,'December');

  insert into monthavg (id,month) values (13,'December');
  ```

Note: Row 13 shows running averages for current month for daily temperature minimum and maximum.
  ```

Weather Tracking – All-Time Month Data min/max

- ```
  create table alltimedata (
      id integer primary key,
      month enum ('January','February','March','April',
  'May','June','July','August','September','October','November','December
  '),
      tmstamp timestamp default current_timestamp on update
  current_timestamp,
      mintempfts timestamp,
      mintempf decimal(4,1) default 120.0,
      maxtempfts timestamp,
      maxtempf decimal(4,1) default -50.0,
      minhumts timestamp,
      minhum decimal(4,1) default 100.0,
      maxhumts timestamp,
      maxhum decimal(4,1) default 0.0,
      lowmBts timestamp,
      lowmB decimal(6,1) default 1050.0,
      highmBts timestamp,
      highmB decimal(6,1) default 900.0
  )
      COMMENT '12 rows – 1 row for each month';

  insert into alltimedata (id,month) values (1,'January');

  insert into alltimedata (id,month) values (2,'February');

  insert into alltimedata (id,month) values (3,'March');

  insert into alltimedata (id,month) values (4,'April');

  insert into alltimedata (id,month) values (5,'May');

  insert into alltimedata (id,month) values (6,'June');

  insert into alltimedata (id,month) values (7,'July');

  insert into alltimedata (id,month) values (8,'August');

  insert into alltimedata (id,month) values (9,'September');

  insert into alltimedata (id,month) values (10,'October');

  insert into alltimedata (id,month) values (11,'November');

  insert into alltimedata (id,month) values (12,'December');
  ```
  ```

CPU Fan Table (cpulatest)

- ```
  create table cpulatest (
    id integer primary key,
    tmstamp timestamp default current_timestamp on update
  current_timestamp,
    cputempc decimal(4,1) default 0.0,
    cpufanstate enum('ON','OFF') default 'OFF',
    fanchangetm timestamp,
    cpufanontempc decimal(4,1) default 55.0,
    cpufanofftempc decimal(4,1) default 45.0);
  ```

- **After creating cpulatest table, MUST INSERT initial record as follows:**

  - ```
    insert into cpulatest (id,cpufanontempc,cpufanofftempc) values
    (1,55.0,45.0);
    ```

CPU Temperature History (historycputemp)

- ```
  CREATE OR REPLACE SEQUENCE cqc
      MINVALUE 0
      MAXVALUE 999
      START WITH 0
      CYCLE
      COMMENT 'Index for historycputemp';
  ```

- ```
  CREATE OR REPLACE TABLE historycputemp (
      id int unsigned not NULL
          DEFAULT NEXT VALUE FOR cqc,
      tmstamp timestamp default current_timestamp on update
  current_timestamp,
      cputempc decimal(4,1) default 0.0,
      cpufanstate enum('ON','OFF') default 'OFF',
      PRIMARY KEY (id),
      CHECK (id < 1000)
  )
      COMMENT '1000 rows maximum';
  ```

Wind and rain readings over time (readings)

- ```
  CREATE OR REPLACE SEQUENCE cqz
      MINVALUE 0
      MAXVALUE 5000
      START WITH 0
      CYCLE
      COMMENT 'Index for windrain';
  ```
- ```
  create table windrain (
  id int unsigned not NULL
          DEFAULT NEXT VALUE FOR cqz,
  recordType enum('AVG','GUST','START','STOP') default 'AVG',
  dbid integer default 0,
  tmstamp timestamp default current_timestamp on update
  current_timestamp,
  windavg1 decimal(4,1) default 0.0,
  windsdev1 decimal(4,1) default 0.0,
  windavg5 decimal(4,1) default 0.0,
  windsdev5 decimal(4,1) default 0.0,
  windspeed decimal(4,1) default 0.0,
  wind_r_volts decimal(5,4) default 0.0,
  wind_r_val integer default 0,
  dir integer default 0,
  winddir enum('North','North-East','East','South-East','South','South-
  West','West','North-West','N/A') default 'N/A',
  wind_h_volts decimal(5,4) default 0.0,
  wind_h_val integer default 0,
  wind_degree decimal(4,1) default 0.0,
  wind_dir_str enum('North','NNE','North-East','ENE','East',
  'ESE','South-East','SSE','South','SSW','South-
  West','WSW','West','WNW','North-West','NNW','N/A') default 'N/A',
  wind_mag_dir_str enum('North','North-East','East','South-
  East','South','South-West','West','North-West','N/A') default 'N/A',
  windgust decimal(4,1) default 0.0,
  gust_interval integer default 0,
  rainfall decimal(4,2) default 0.00,
  rainfall_counter integer default 0);
  ```

Current Weather Stats

- ```
  create table current_stats (
      id integer primary key,
      tmstamp timestamp default current_timestamp on update
  current_timestamp,
      windavg1 decimal(4,1) default 0.0,
      windavg5 decimal(4,1) default 0.0,
      wind_dir integer default 0,
      wind_dir_str enum('North','NNE','North-East','ENE','East',
  'ESE','South-East','SSE','South','SSW','South-
  West','WSW','West','WNW','North-West','NNW','N/A') default 'N/A',
      wind_degree decimal(4,1) default 0.0,
      windspeed decimal(4,1) default 0.0,
      windmax1hour_tm timestamp,
      windmax1hour decimal(4,1) default 0.0,
      windmaxtoday_tm timestamp,
      windmaxtoday decimal(4,1) default 0.0,
      gust_tm timestamp,
      gust decimal(4,1) default 0.0,
      gust_intervals integer,
      rainfall_today decimal(4,2) default 0.00,
      rainfall_counter integer default 0,
      dt DATE,
      sunrise TIME,
      sunset TIME
  );
  ```
- ```
  insert into current_stats (id) values (1);
  ```

- ```
  create table sun (
  dt DATE primary key,
  sunrise TIME,
  sunset TIME
  );
  ```
  ```