Query 7

Query overview
This query integrates and summarizes your analysis of measured Y2E2 energy performance data, interpreting its importance using your assumptions, methods and findings. Your broad goal is to maximize diagnostic precision, actionability for Y2E2 operators and explanatory clarity for operators, future students and for the broader industry. Please use the best and most suitable analytical and visualization methods that you have experienced in the class.

The final submission has three major elements, which are explained in detail below:
1. Clarify system descriptions and processes to collect and analyze data. For the system(s) you analyzed this quarter, create a new version of one or more sections of the Data Manual and describe:
   - Functional intent and operationalizing rules for points and systems, based on content of the Sequence of Operations and your understanding.
   - Point list and point properties, modifying the v2 Data Manual to add a set of useful point properties to the existing point list.
   - Examples of applying your operationalized functional rules to specific BMS data
2. Assess point and system performance given functional intent. For your systems, assess point and system and building energy system status given SEE IT data, based on your operationalized assessment rules.
3. Class summary: a copy of your final class presentation.

Due Date
Midnight on the last day of classes, Wednesday, June 6. Please submit your analysis through your wiki page.

Background
2. Y2E2 point list: http://www.stanford.edu/class/cee243/Data/Y2e2PointListSortedV3.xlsx

1. Create content that updates the Data Manual
The Data Manual now has lots of information. Our goal is to help update the content and make the content actionable for a building manager and for future students and researchers. In your updated submission, do some simple copy editing and clarify segments of the manual that you update, e.g.,

- In discussions, refer to specific tables. For example, replace “For the AHUs there are ten measurements ...” with something like “As shown in Table ...”
- For any systems other than those of your principal focus for which you have new information that you have learned this quarter, copy and reference any relevant sections from the Data Manual that you can correct, clarify or elaborate.

Please:

- (2 points) Describe your system clearly and submit (in Word format):
  - Show a systems diagram;
  - List specific BMS sample and control points, referring to or annotating the systems diagram;
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- Describe the system functional intent, typically a copy of the intent from the Sequence of Operations that you might edit to reflect any updated understanding;
- (1 point) The current point description tables in the Data Manual typically are uneditable .jpg images. Please create and submit editable Excel point description tables:
  - Include all columns in the point list table (see source 2 in Background) in your Wiki table. As it may be helpful, please edit or add comments to column names to maximize precision and clarity
    - For your convenience and the convenience of readers, please order values in the data table so that your six or so parameters appear close to each other in the table and other parameter rows are above or below your reference point rows.
  - Add a column to your point list table to describe an additional useful property;
  - For the BMS sample points referenced in your operationalized rules or at least six points, add values for point attribute values, based on you have learned from other sources such as the Sequence of Operations or inferred by looking at data or appealing to engineering judgment.
- (1 point) Add a Guide for users page to your wiki that explains how to (maximum 250 words):
  - Explain how the diagnostic process you followed can be used more generally to interpret data over time for Y2E2 and other buildings with a computer-based energy building management system;
  - Choose where to spend time to improve building energy use.

2. Report SEE IT data and your analysis of its conformance to functional intent

Show analyses of systems performance. Include performance analysis, based on work you did this quarter that specifically includes:

- Date and times of plotted or listed data, e.g., noon July 1, 2011 – noon July 30
- SEE IT graphs that represent system performance from the perspective of one or a small set of related points.
  - (2 points) Show graphs of at least one period of a month or more and another period of a week or less. Consider different ways to visualize single points and sets of data to enable believable diagnostic classification;
  - (1 point) Annotate any important features or regions of interest such as bands of functionally intended (green), questionable (yellow) and unintended (red) behavior;
  - (1 point) Identify implications of each graph to building operators;
  - (1 point) Comment on the relative strengths and weaknesses of your graphic representation(s);
  - (1 point) Suggest guidelines for best practices in how to do status classification and how to represent system data to enable simple and believable classification.
- Data tables that show individual time samples of one or a small set of points selected from the two examples above.
  - (1 point) For your (six or so) points mentioned above, show the assessment of the conformance of the data to functional intent as expressed in status assessment rules, e.g., green/yellow/red traffic light status. Show a large enough (over time) point set so that your assessment includes some variance in assessed performance, i.e., not all green or red;
  - (1 point) Show or reference the assessment rules;
  - (1 point) for your system(s), show, ideally with a graphic symbol such as a traffic light, the conformance of data to individual rule clauses and aggregate rule intent;
  - (1 point) Show the statistical conformance to intent of all your points and rules;
  - (1 point) Comment on your recommendation(s) to the building operator of the detailed point status assessment.
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3. **PowerPoint Presentation**
(5 points) Add your final class summary PowerPoint presentation on your wiki page.

- Describe the system you analyzed and processes to collect and analyze data, including:
  - Functional intent and operationalizing rules for points and systems;
  - Point list and point properties;
  - Examples of applying your operationalized functional rules to specific BMS data.
- Assess point and system performance given functional intent as represented in your operationalized assessment rules. Show detailed assessment of data for a month of your choice and for a year.
- Present analysis methods that you used for this query and the rest of the course.
- Include your recommendations for the following topics:
  - Analysis methods
  - Building operations
  - A future class
  - Research and development

4. **ORID Analysis**
(1 point) ORID analysis: In the wiki, please briefly summarize

- **Objective:** What facts did you see this quarter? What factual statements can you make based on the data?
- **Reflective:** What surprised you? What encouraged or discouraged you?
- **Interpretive:** What sense do you make of what you did this quarter?
- **Decisional:** What are our proposed next steps? What is your action plan for next steps?