Symbols for water flow rates

* A = Partial Day
* D = Dry
* R = Revised
* B = Ice Conditions
* E = Estimated

<https://wateroffice.ec.gc.ca/google_map/google_map_e.html?map_type=historical&search_type=province&province=AB>

<https://climate.weather.gc.ca/climate_data/daily_data_e.html?StationID=50430>

1. Problem (100 words or more)
   1. What problem are you solving?
      1. Predicting Bow River flood events. so that evacuation can take place in Calgary.
   2. Why is it worth solving?
      1. Evacuation, preparedness, etc.
   3. What are the requirements for crafting a solution for this problem?
      1. Collect historical data on weather conditions and flow rates, use ML to predict.
2. Methodology (100 words or more) - Danylo
   1. How did you solve the problem?
      1. Gather raw data on internet (weather, flow rates)
      2. Combine all data into one spreadsheet
      3. Create output feature, predicting 1 and 2 days in advance
      4. Remove unwanted data (winter months, missing data, etc.)
      5. Preprocess (min-max normalization)
      6. Build machine learning model.
      7. Evaluate model, optimize model, repeat.
3. Results (100 words or more)
   1. What were the results?
      1. Predicted flow rates accurately for normal flow rates 1 to 2 days ahead.
      2. Predicted flow rates for flood days, but accuracy way down.
4. Conclusion (100 words or more)
   1. How could an organization or institution implement/use the use solution?
   2. Any lessons learned? How can the solution be improved?
      1. Identified large availability of data on line, government organizations make it free.
      2. Data is stored in lots of various formats, requires time/energy to merge.
      3. Predicting anomalous events accurately difficult, without lots of historical data.
      4. Lots of time spent gathering data, reformatting, wrangling, cleaning, before any ML used.
      5. More data (snow pack, soil moisture, more longer time period, more flood events).
      6. Separate model for high flow events. River behaves differently.