Weather Prediction System

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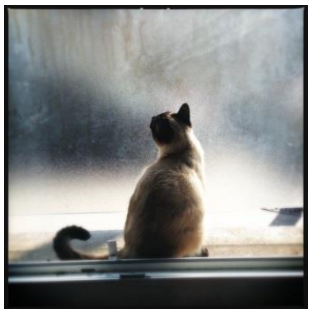
What's the problem?

* A farmer's livelihood is dependent on their ability to grow crops.
* This is hard when factors beyond their control – like *weather* – get in their way.

Current Solutions

* Look outside the window.



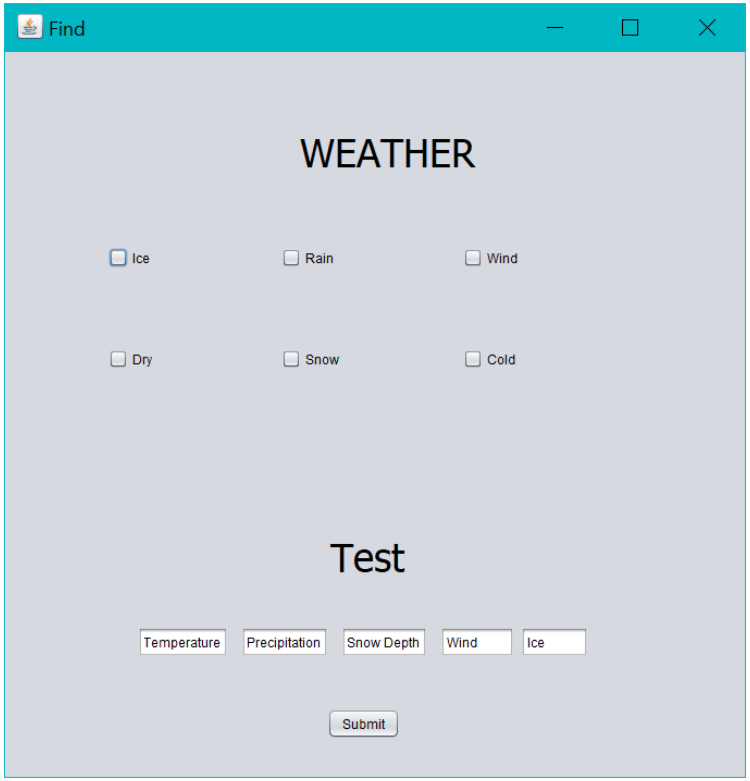
* Problem?
* By the time you see bad weather, it's too late to do anything!

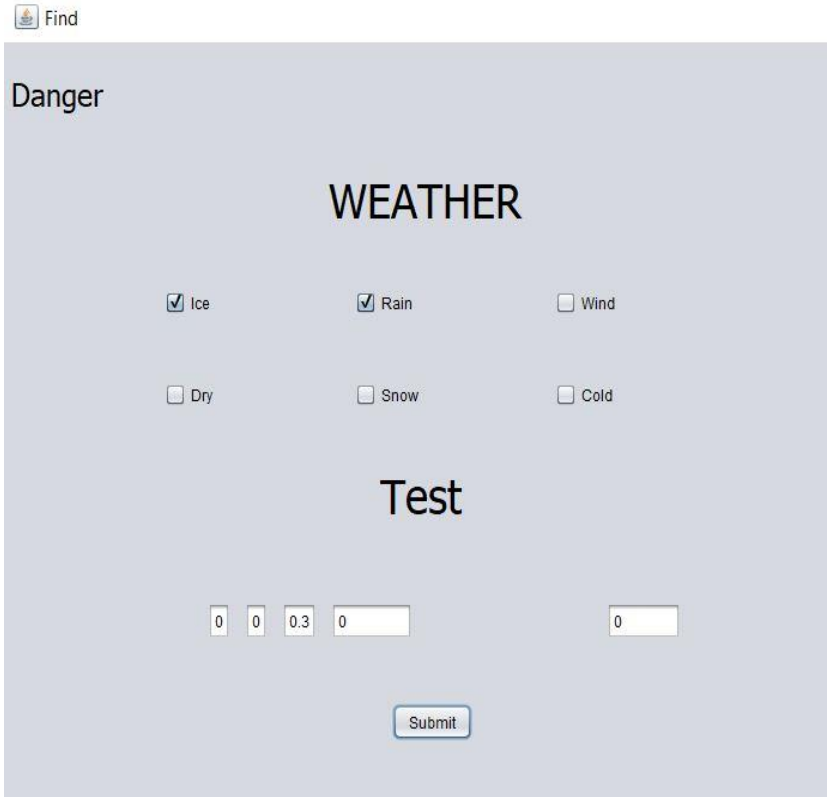
Current Solutions (2)

* Check the weather network.

* Problem?
* Some farms are *huge* and far away from weather stations. Their predictions may not be accurate!

Introducing the Weather Prediction System!





What is the Weather Prediction System?

* The weather prediction system helps farmers by providing **customized predictions** so farmers know what's coming!

How is this done?

* The weather prediction system uses machine learning technology as well as open datasets to make informed predictions about the future.

Finding the Data

* First, we determined the criteria for safe and dangerous weather conditions by interviewing a **real** farmer from Saskatchewan.

Finding the Data (2)

* We found a local weather archive from the Town of North Carolina, which we will use for this demonstration.
* In theory, farmers will be able to use their own local data.

Finding the Data (3)

* We determined that the following criterion makes weather conditions dangerous:

Element	Condition
Rain	Precipitation<6
Wind	Wind>20 miles/hr
Snow	snowdepth>0.5 inches
Cold	Max_temp<86 degree F
Ice	Ice True/False

Cleaning the Data Set

* To make the data usable, we reformatted the dataset to look like this:

Rain	Ice	Snow	Wind	Hail	Danger
T/F	T/F	T/F	T/F	T/F	T/F

* Of course, the danger column was calculated using the table from the previous slide.

Training the Classifier

* The classifier was trained in Python (for simplicity).
* For each label, rain, ice, snow, wind, and hail were used as attributes, danger was used as output.

Evaluating the Performance

Next Steps

* Weather is inheriently a time-dependent variable.
* Having rain today makes it less likely to rain tomorrow.
* Our model does not take that into account!

Next Steps (2)

* To improve the accuracy of our model, we need to add memory to our model.
* We can do this with a recurrent neural network!