Personalized Decision Tree

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Motivation

A decision tree can aid people in decision making, but sometimes it asks too many questions…

So just trim it!
States of the Art (Manual construction)

iBoske

- online decision tree creation/sharing
- can edit nodes at user’s will by mouse clicking
- can link nodes with external links or figures

- Trees are built based on experience rather than data
- Only 4 unchangable color encodings for title/question/answer/solution
States of the Art (Automatic Construction)

Graphviz (Python package)

- support visualize the decision tree trained from scikit-learn
- use color encoding to signify class of majority
- Greyscale for ‘purity’ of each node

- not interactive, only a static plot
- needs programming knowledge to load data and train the model
States of the Art (Automatic Construction)

BigML

- can upload data, split into training and testing set and create a model without programming
- more interactive visualization: Hovering over a node will highlight the path it follows and showing all the decisions along the path.
- click on a node can collapse nodes not on the path (better focus)
- evaluation can provide more metrics and compare with prebuilt baselines
- But still no support for manual pruning...
Sketch of functions

Allow manually pruning of decision tree

Basic Pruning

Advanced Pruning
Description of Approach

server(python)
Training/Update of Decision Tree Data

Http Request

Http Response(json file)

browser(D3)
Visualization and Interaction of Decision Tree
**Proposed Timeline**

<table>
<thead>
<tr>
<th>Start Date</th>
<th>End Date</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>15-Nov</td>
<td>22-Nov</td>
<td>Build decision tree visualization of scikitlearn result</td>
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<tr>
<td>22-Nov</td>
<td>29-Nov</td>
<td>Accomplish the function of basic pruning</td>
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<tr>
<td>22-Nov</td>
<td>29-Nov</td>
<td>Improve visualization of decision tree</td>
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<tr>
<td>22-Nov</td>
<td>10-Dec</td>
<td>Accomplish the function of advanced pruning</td>
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<tr>
<td>1-Dec</td>
<td>10-Dec</td>
<td>Allow users to set parameters for automatic pruning</td>
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<tr>
<td>1-Dec</td>
<td>10-Dec</td>
<td>Add a search bar to highlight the decision path of searched sample</td>
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Questions?

Thank you