PLDB

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Programming Languages + Data Management
Users want high-level languages and tools to interact with the DBMS.
Easy integration with app
Maintain single code base
Don’t need to learn SQL (!)

Impedance mismatch
End-to-end consistency
Performance issues

Use PL techniques to help users interact with and build DBMS
End-User Tools

Is there something equivalent to argmax in SQL?

If I'm reading your question correctly, the following query should do it:

```sql
SELECT x.*
FROM YOUR_TABLE x
WHERE x.column = (SELECT MAX(y.column)
    FROM YOUR_TABLE y)
```

Of course, if you have more than one row where the column attains its maximum, then you'll get more than one row back from the query.

Hello computer.
What in the world does “SELECT * FROM … …” mean?

This is a query that returns the rows with the max value of column A from table T.

Joint work with Srini Iyer and Luke Zettlemoyer
## Queries from Constraints

<table>
<thead>
<tr>
<th>Time</th>
<th>Sensor ID</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time &gt; 1pm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>20.1</td>
</tr>
<tr>
<td>11</td>
<td>10</td>
<td>4.1</td>
</tr>
<tr>
<td>10</td>
<td>20</td>
<td>30.2</td>
</tr>
<tr>
<td>1</td>
<td>20</td>
<td>35</td>
</tr>
</tbody>
</table>

- All rows returned must have time > 1pm
- One of the rows have sensor ID = 10
- User wants to group by sensor ID
- Ask user which aggregate to use

SELECT * FROM sensors
WHERE time > 1pm OR id = 10

Joint work with Chenglong Wang and Ras Bodik
PL for Building DBMS

• **Brandon Haynes** (this morning)
  PipeGen: Automatic Generation of Data Pipes for Hybrid Analytics

• **Shumo Chu** (later this afternoon)
  Formal Verification Framework for Query Optimization
PL for Writing DBMS Apps

• Cong Yan
  Leveraging Lock Contention to Improve Transaction Application Performance

• Maaz Ahmad
  Translating Sequential Java Programs to MapReduce Using Verified Lifting