What is a database?

- Collection of data
- Describes activity between >=1 organizations
  - Entities
  - Relationships

Where Do We See Databases?
**Where Do We See Databases?**

### Table 1: Branch and ATM Transaction Matrix

<table>
<thead>
<tr>
<th>Bank Branch</th>
<th>Total</th>
<th>Cash</th>
<th>Debit</th>
<th>Credit</th>
<th>Other</th>
<th>Total</th>
<th>Cash</th>
<th>Debit</th>
<th>Credit</th>
<th>Other</th>
<th>Total</th>
<th>Cash</th>
<th>Debit</th>
<th>Credit</th>
<th>Other</th>
<th>Total</th>
<th>Cash</th>
<th>Debit</th>
<th>Credit</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank A</td>
<td>123</td>
<td>45</td>
<td>67</td>
<td>89</td>
<td>12</td>
<td>100</td>
<td>11</td>
<td>22</td>
<td>33</td>
<td>44</td>
<td>55</td>
<td>66</td>
<td>77</td>
<td>88</td>
<td>99</td>
<td>100</td>
<td>111</td>
<td>122</td>
<td>133</td>
<td>144</td>
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<tr>
<td>Bank B</td>
<td>234</td>
<td>56</td>
<td>78</td>
<td>90</td>
<td>21</td>
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<td>29</td>
<td>30</td>
</tr>
<tr>
<td>Bank C</td>
<td>345</td>
<td>67</td>
<td>89</td>
<td>101</td>
<td>32</td>
<td>300</td>
<td>33</td>
<td>44</td>
<td>55</td>
<td>33</td>
<td>33</td>
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<td>33</td>
<td>33</td>
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<td>33</td>
<td>33</td>
<td>33</td>
<td>33</td>
</tr>
</tbody>
</table>

**Where Do We See Databases?**

### Table 2: Other Transaction Matrix

<table>
<thead>
<tr>
<th>Other Transaction</th>
<th>Total</th>
<th>Cash</th>
<th>Debit</th>
<th>Credit</th>
<th>Other</th>
<th>Total</th>
<th>Cash</th>
<th>Debit</th>
<th>Credit</th>
<th>Other</th>
<th>Total</th>
<th>Cash</th>
<th>Debit</th>
<th>Credit</th>
<th>Other</th>
<th>Total</th>
<th>Cash</th>
<th>Debit</th>
<th>Credit</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transaction 1</td>
<td>456</td>
<td>67</td>
<td>89</td>
<td>101</td>
<td>32</td>
<td>300</td>
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<td>33</td>
<td>33</td>
<td>33</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>Transaction 2</td>
<td>567</td>
<td>78</td>
<td>90</td>
<td>102</td>
<td>33</td>
<td>301</td>
<td>34</td>
<td>45</td>
<td>56</td>
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<td>34</td>
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<td>34</td>
<td>34</td>
</tr>
<tr>
<td>Transaction 3</td>
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<td>89</td>
<td>101</td>
<td>103</td>
<td>34</td>
<td>302</td>
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<td>46</td>
<td>57</td>
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<td>35</td>
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</tr>
</tbody>
</table>

**Where Do We See Databases?**

### Table 3: Additional Transaction Matrix

<table>
<thead>
<tr>
<th>Additional Transaction</th>
<th>Total</th>
<th>Cash</th>
<th>Debit</th>
<th>Credit</th>
<th>Other</th>
<th>Total</th>
<th>Cash</th>
<th>Debit</th>
<th>Credit</th>
<th>Other</th>
<th>Total</th>
<th>Cash</th>
<th>Debit</th>
<th>Credit</th>
<th>Other</th>
<th>Total</th>
<th>Cash</th>
<th>Debit</th>
<th>Credit</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional 1</td>
<td>789</td>
<td>90</td>
<td>102</td>
<td>104</td>
<td>35</td>
<td>303</td>
<td>36</td>
<td>47</td>
<td>58</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
</tr>
</tbody>
</table>
Introduction

• Database
  – Collection of related data
  – Known facts that can be recorded and that have implicit meaning
  – Represents some aspect of the real world
  • Miniworld or universe of discourse (UoD)
  – Logically coherent collection of data with inherent meaning
  – Built for a specific purpose

Introduction (cont'd.)

• Example of a large commercial database
  – Amazon.com
• Database management system (DBMS)
  – Collection of programs
  – Enables users to create and maintain a database
• Why do we need these?
  – Data is everywhere
  – Simplify tasks for getting info
  – What is a RDBMS?

Databases: A Brief History

• The first general-purpose DBMS:
  – Charles Bachman @ GE, 1960’s.
  – Network model.
  – Turing award.
• IBM: Information Management System
  – 1960’s.
  – Hierarchical model.
  – Sabre and AA.
  – Travelocity.
Databases: A Brief History

• Relational data model
  – Edgar Codd @ IBM San Jose, 1970’s.
  – Turing award.
• SQL language

Databases: A Brief History

• Various database management systems:
  – DB2 (IBM).
  – Oracle.
  – UDS (Informix, now part of IBM).
  – Sybase SQL server.
  – Microsoft SQL server.

Database Access

• Visit https://secure.onid.oregonstate.edu/cgi-bin/my?type=want_auth
• Log in and choose Web Database
• Information is provided for:
  – Database name:
  – User id:
  – Password:
Homework

• Read the text
  – Chapter 1 & 2
• Assignment #1
  – Posted on class website