Math 1000
Mathematical Literacy in Today’s World

Winter 2010
Do I need this course?

- This course may be required to satisfy the General Education Mathematics requirement IF you:
  - Entered college Fall 2005 or later, and
  - Will not take any higher mathematics course.
Do I want to take this course?

- NOT if any higher Mathematics course is required by your prospective major, including:
  - Elementary Education
  - Physical Therapy
  - Pre-pharmacy
  - Business
  - Economics
  - Etc.!
Can I take this course?

- **Placement by Exam:**
  If you took the Mathematics Placement Exam after January 2009 and received placement into MAT 1000 or 1050.

- **Placement by Course:**
  If you took MAT 0993 during Winter 2009, Spring/Summer 2009, or Fall 2009 and received a grade of C- or better.
Lecturer Information

- Lecturing Monday and Wednesday, 11:45
- Peter Malcolmson
- Office in 1123 Faculty-Administration Building (FAB)
- 577-2472
- petem [at] wayne.edu
- Mailbox in 1124 FAB
Office Hours for Lecturer

- TENTATIVELY (may be changed after consulting with students)
- Monday 1:00-2:00
- Tuesday 1:00-2:00
- Friday 11:45-12:40
Department Information

- Mathematics Department
- 1150 FAB, open 8:30-5:00 or later
- (313) 577-2479
Quiz Sections

- Meet Tuesdays and Thursdays
- With Instructors Ross Fazio, Yu Sun, Guangliang Zhao, Son Luu Nguyen, or John Peter

- To discuss worksheets and homework, and take quizzes.
Textbook

“For All Practical Purposes: Mathematical Literacy in Today’s World”, Eighth Edition
By COMAP (a consortium)
W.H. Freeman, Publisher
Course Website

- [www.math.wayne.edu/~petem/Mat1000/](http://www.math.wayne.edu/~petem/Mat1000/)

- We’ll try to put course materials on Blackboard as well
Amount of Text Covered

- Part II on data analysis
  (Most of Chapters 5, 6, 7, 8)

- Part VI on Money and Resources
  (Most of Chapters 21, 22, 23)
Brief Overview

Statistics
- Analysis of data
- Numerical measures of distribution
- Making statements about data

Money and Resources
- Saving, Borrowing, and Interest
- General Ideas of Growth and Decay
Help outside of class

- Office Hours for Lecturer and Instructors
- Mathematics Resource Center (“Tutor Lab”) in Room 1198 FAB, open 9-6 Monday thru Thursday and Friday 9-12
- Academic Success Center in the Undergraduate Library
- Other students
Calculators

- You will want to have a calculator that can compute two-variable statistics.
- You can borrow one for the term (but get the manual too), OR
- Consider buying a TI-30XS (available at the WSU book store for about $20)
Attendance

- We will be taking attendance during lecture and quiz sections.
- Students missing more than six lecture or quiz sessions will be penalized, on an accelerating scale.
Mathematics requires a certain level of seriousness, which we will try to practice. You are therefore responsible for:

- No cell phone rings or other interruptions during sessions
- Paying attention during sessions
- Keeping up with the homework
- Asking questions if confusion occurs
Homework

- Suggested for each subject from Skills Checks and Chapter Exercises.
- For practice in doing problems like those on the quizzes/exams.
- Collected from time to time during the term.
- Lists available on Website.
Worksheets

- To identify difficulties and for practice.
- Available during most quiz sessions.
- Discuss with other students, consult the book, or ask the instructor.
- Be sure to turn in the worksheet before you leave.
Quizzes

- Taken in quiz sections
  - After Chapters 5, 6, 7, 21, 22
  - Using only calculators (no notes, books or phones)
  - 30 points each
Exams

- Midterm Exam covers Chapters 5-8.
  - Held Wednesday, March 10 in Lecture.
  - Quiz Rules apply.

- Final Exam covers mostly Chapters 21-23, with some coverage of earlier material.
  - Held Thursday, April 29 in Lecture.
  - 10:40 AM – 1:20 PM
Grades

Based on total points from
- Homework/Worksheets (100 points)
- Quizzes (150 points)
- Midterm Exam (100 points)
- Final Exam (150 points)

Students who get 90% of the points will get at least an A-, those with 80% will get at least a B-, etc.
So now, on to the Course
Some Data (Test scores?)

A “List”

67  57  69  76  83  56  70  50  78  45
77  35  60  87  71  84  93  68  34  66

How can we make this better?

What does “better” mean?
One way to improve the List

An “Ordered List”

34  35  45  50  56  57  60  66  67  68
69  70  71  76  77  78  83  84  87  93

How is this better?

What is still needed?
An Ordered and Grouped List

34  35
45
50  56  57
60  66  67  68  69
70  71  76  77  78
83  84  87
93
A “Stemplot”

<table>
<thead>
<tr>
<th>“Stems”</th>
<th>“Leaves”</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>4 5</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>0 6 7</td>
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<tr>
<td>6</td>
<td>0 6 7 8 9</td>
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<tr>
<td>7</td>
<td>0 1 6 7 8</td>
</tr>
<tr>
<td>8</td>
<td>3 4 7</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
</tr>
</tbody>
</table>

34  35
45
50  56  57
60  66  67  68  69
70  71  76  77  78
83  84  87
93
A “Histogram”

34  35
45
50  56  57
60  66  67  68  69
70  71  76  77  78
83  84  87
93
Histogram versus Stemplot

<table>
<thead>
<tr>
<th>Grade Range</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-39</td>
<td>2</td>
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<tr>
<td>40-49</td>
<td>2</td>
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<td>50-59</td>
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<tr>
<td>80-89</td>
<td>4</td>
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<tr>
<td>90-100</td>
<td>3</td>
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</table>

<table>
<thead>
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<th>Grade Range</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-39</td>
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</tr>
<tr>
<td>40-49</td>
<td>4, 5</td>
</tr>
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<td>5, 0, 6, 7</td>
</tr>
<tr>
<td>60-69</td>
<td>6, 0, 6, 7, 8</td>
</tr>
<tr>
<td>70-79</td>
<td>7, 0, 1, 6, 7, 8</td>
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<tr>
<td>80-89</td>
<td>8, 3, 4, 7</td>
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<tr>
<td>90-100</td>
<td>9, 3</td>
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</table>
A Different Set of Data

<table>
<thead>
<tr>
<th>30</th>
<th>30</th>
<th>32</th>
<th>32</th>
<th>32</th>
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<td>45</td>
<td>45</td>
<td>45</td>
<td>46</td>
<td>47</td>
</tr>
</tbody>
</table>

Easier to count in this arrangement.
A Wrong Stemplot

What is wrong?

How do we fix it?
Another Wrong One

This might be OK, if you have the space.
The Corresponding Histogram
A Better Stemplot

We have chosen more appropriate “intervals”, or “class intervals”.
The Corresponding Histogram

Number of Scores

<table>
<thead>
<tr>
<th>Range</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-31</td>
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<tr>
<td>34-35</td>
<td>5</td>
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<tr>
<td>38-39</td>
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<tr>
<td>42-43</td>
<td>4</td>
</tr>
<tr>
<td>46-47</td>
<td>3</td>
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</tbody>
</table>
A Different Set of Data??

<p>| | | | | | |</p>
<table>
<thead>
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<th></th>
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<td>3.4</td>
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<td>3.7</td>
<td>3.7</td>
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<td></td>
</tr>
</tbody>
</table>

(Old One was

<p>| | | | | | | |</p>
<table>
<thead>
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<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>30</td>
<td>32</td>
<td>32</td>
<td>32</td>
<td>32</td>
<td>32</td>
</tr>
</tbody>
</table>
| 32   | 32    | 33    | etc.)
|      |       |       |       |       |       |       |
A Similar Stemplot

<table>
<thead>
<tr>
<th>300</th>
<th>2 2 2 2 2 3 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 4 4 5</td>
<td>6 6 6 6 6 6 7</td>
</tr>
<tr>
<td>8 8 9 9 9 9</td>
<td>8 8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>401</th>
<th>2 2 2 2 2 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 2 2 2 2 3</td>
<td>4 5 5 5</td>
</tr>
<tr>
<td>6 7</td>
<td></td>
</tr>
</tbody>
</table>

Now the leaves are decimal places instead of last digits.

Warning: They look the same!!
The Corresponding Histogram

But not here.
Data with more digits

134  249  157  362  428  283  691  745  418  558
212  590  444  201  737  696  487  337  189  543
The Stemplot with big Leaves

<table>
<thead>
<tr>
<th></th>
<th>34 57 89</th>
<th>134 249 157 362 428</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>01 12 49 83</td>
<td>283 691 745 418 558</td>
</tr>
<tr>
<td>3</td>
<td>37 62</td>
<td>212 590 444 201 737</td>
</tr>
<tr>
<td>4</td>
<td>18 28 44 87</td>
<td>696 487 337 189 543</td>
</tr>
<tr>
<td>5</td>
<td>43 58 90</td>
<td>Original Data Values</td>
</tr>
<tr>
<td>6</td>
<td>91 96</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>37 45</td>
<td></td>
</tr>
</tbody>
</table>
How to Pick Classes?

- CLASSES MUST BE THE SAME SIZE !!
- Not too few in each class
- Not too few classes

But after that – it’s not such a big deal.
Histogram – Five Classes

Running Times

<table>
<thead>
<tr>
<th>Time (Minutes)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>95-110</td>
<td>10</td>
</tr>
<tr>
<td>110-125</td>
<td>40</td>
</tr>
<tr>
<td>125-140</td>
<td>30</td>
</tr>
<tr>
<td>140-155</td>
<td>20</td>
</tr>
<tr>
<td>155-170</td>
<td>10</td>
</tr>
</tbody>
</table>
Histogram – Nine Classes

Running Times

Times (Minutes)

95-105
105-115
115-125
125-135
135-145
145-155
155-165
165-175
Above 175

Frequency
Histogram – Fifteen Classes
Histogram - Nineteen Classes

Running Times

Times (Minutes)

Frequency

Frequency

0 2 4 6 8 10 12 14 16
The End for Today