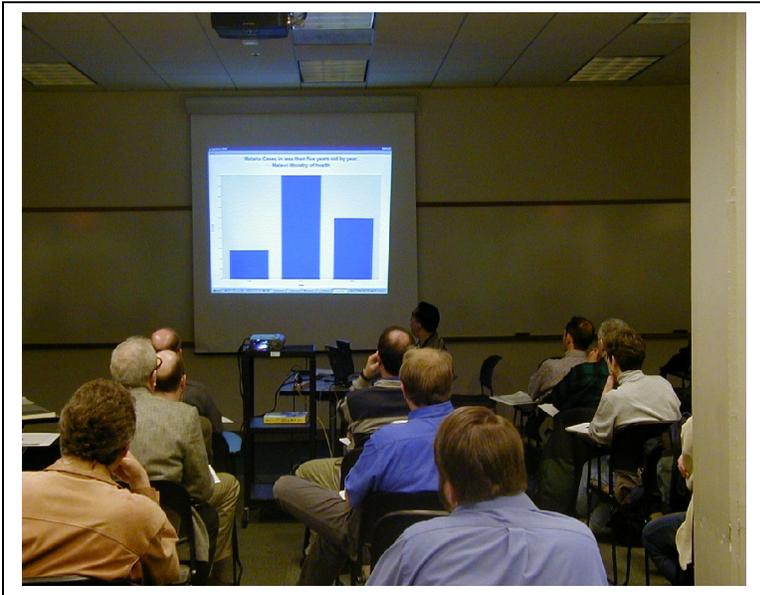


**Instructor's
or Self
Instructor's
Manual**



for
**Computing with Epi Info
Parts I and II**

Andrew G. Dean, MD, MPH
www.EpiInformatics.com

© University of Medicine and Dentistry of New Jersey (UMDNJ) 2004

Revised March 2007

The University hereby gives a non-exclusive, royalty free license to Vendor to use the materials in any teaching, publication or educational work by the Vendor. The University agrees to make the information available to the public.

The “Vendor” is Andrew G. Dean, who hereby publishes these materials for free use in public health and other humanitarian endeavors.

Contents

Instructor's or Self Instructor's Manual.....	1
Contents.....	2
Introduction.....	3
Why Use Epi Info?.....	3
Prerequisites.....	4
Obtaining, Installing, and Testing Epi Info.....	4
Computers.....	6
Printed Materials.....	6
Demonstrations.....	6
Compact Disks (CDs).....	7
Internet.....	7
Other Resources.....	7
Help and Collaboration.....	7
Acknowledgment.....	8
Recent Additions to Course I (November 2006).....	8
Versions of Epi Info (March 2007).....	8
Problems with Epi Info 3.3.2 and Microsoft Internet Explorer 7 (March 2007).....	8
Table of Contents for Epi Info Course I Manual.....	9
Objectives for Course I.....	10
Course Title.....	10
Epi Info Course I (Introduction to Public Health Computing with Epi Info).....	10
Course Description.....	10
Learning Objectives.....	10
Schedule for Epi Info Course I.....	11
Day 2.....	12
Course Objectives.....	13
Schedule for Epi Info Course II.....	15
Day 1.....	15
Day 2.....	17

Introduction

The two courses in this series are designed for students of Public Health or for community public health workers. They are used as the basis for courses in a School of Public Health, and also for regional epidemiologists within a state. Each course is given on a weekend, for six to eight hours on each of two days, since many of the students have other jobs during the week. One academic, semester-hour credit is given for Part I and another for Part II.

Why Use Epi Info?

Why use Epi Info for a course in Public Health Computing? Here are reasons that may or may not be important in your setting:

- It is available without charge and can be downloaded or distributed on CD ROM so that students are immediately equipped with the tools they study in class and have a reasonable expectation of obtaining updates in the future
- It uses Microsoft Windows standards such as Microsoft Access Databases, HTML, and ESRI shapefiles, and can import and export common database formats for compatibility with SAS, SPSS, Stata, ArcView, Excel, and other popular database and statistics programs.
- Many students find Epi Info easier to understand than larger programs
- Epi Info and related materials are available in Spanish, Italian, and possibly other languages (See the www.cdc.gov/epiinfo) web site for more information.)
- Epi Info may have been used to construct permanent applications in the setting from which the students come, thus making these courses particularly relevant
- Because it is possible to design and implement a new database system in half an hour, Epi Info permits rapid instruction in informatics principles
- Epi Info integrates database design, data entry, data management, tabulation, a broad range of epidemiologic statistics, nutritional anthropometry, graphing, geographic information systems (GIS), encryption and decryption of files, double data entry and verification, help files, tutorials, and a configurable menuing system, into one (more or less) consistent package.

Epi Info for DOS, or Epi Info 6 was popular during the 1980s and 90s, and is still used in many settings today. It has the advantages of simplicity and reliability and the transparency of a text-based file structure, but is increasingly less compatible with the Windows environments that now dominate public health computing at the desktop and laptop level.

Epi Info for Windows, the subject of the two courses presented here, initially acquired a reputation for being “buggy,” partially because it was, and partially because early users expected Windows programs to respond like and resemble DOS programs. Over the 4 years since its release, however, most of the bugs have been corrected, and the programs

are now comparable in solidity to Epi 6. The author's own experience is that, although the programs could be easier to use, and several approaches to solving a problem may be needed before one succeeds, that once something works, it continues to work. These exercises represent the results of considerable trial and error in the hope of leading students and instructors past the difficult points.

Some users still regret the choice of the Microsoft Access file format as the standard for Epi Info for Windows, because it is neither transparent nor easily understood. The file format should be explained early in Course I and again in Course II if necessary, as the concept of Microsoft Database (MDB) or project containing multiple instances of Views and Data Tables is quite different from the REC and QES files of Epi 6. A PowerPoint description of MDBs, Views, and Data Tables is provided with Course I.

To the maximum extent possible, the course is a hands-on, laboratory experience, although classes of students, particularly those from outside the United States, seem to expect a certain amount of lecturing, coordinating, and general hand-waving from the instructor. In teaching a class of 10 to 25 students, it is important to have at least one assistant who can circulate, look over shoulders, answer questions, and alert the instructor when students are having problems. In choosing assistants, extensive knowledge of Epi Info itself--although desirable--is less important than general Windows competence, patience with students, and concepts of public health .

Prerequisites

Both courses require a general perspective of public health comparable to that of Public Health Master's candidates, medical students, or those working in medical or public health systems. Course I is designed for students with minimal computer skills, and many students have only used Windows for word processing and perhaps email. Course II builds on knowledge of data management taught in Course I. Students beginning course II should be able to make a questionnaire View in Epi Info and do simple data analysis. If they have not taken Course I, this might be obtained by doing the exercises in the Introduction to Epi Info for Windows available from www.EpiInformatics.com and contained on the CD ROM that accompanies this manual. Exceptions can be made for students with advanced knowledge of other database and statistics programs, particularly if they are quick learners.

Strangely enough, those who seem to have the most difficulty in learning Epi Info for Windows are either Epi 6 users or SAS or SPSS text-oriented programmers. Students who have grown up with Microsoft Windows rather than DOS seem to learn and enjoy Epi Info for Windows quite readily.

Obtaining, Installing, and Testing Epi Info

The latest version of Epi Info for Windows is available from www.cdc.gov/epiinfo, and can be downloaded and distributed as a single file on CDROM. With a fast Internet connection, it can also be installed directly from the web site. A README.TXT file is

usually available at the same site. Additional materials, such as tutorials, are available by perusing the same site. These and other teaching materials are described in the next section.

Epi Info is designed to be run from individual computers and not from a network server, although it can be installed from a server in a computer laboratory, and students can all enter data in the same database (MDB) on the server (but with load limitations that should be tested in advance).

Problems in installation have arisen in the following situations:

- Failing to uninstall previous versions of Epi Info for Windows, unless the web site instructions say otherwise
- When disk space or RAM or operating systems vary among computers in a laboratory and this is not discovered early
- Installing with administrative user privileges and conducting the class in a laboratory that imposes special security restrictions on student use. If this is planned, then it is important to test the programs thoroughly in Student mode, and even then, to have someone with Administrative privileges available to enable problems to be corrected if necessary. We manage to teach in a laboratory where the Administrator goes home for the weekend, and no one has administrative access during the course, but there have been some very close calls and some strange workarounds invented on the spot.
- Where MDBs are either copied from a CDROM by Windows (not XP) in read-only form, or when installed files are made read-only by security modes in a student laboratory. MDBs will not function as read-only files, and this situation must be corrected before doing the exercises. MDBs cannot be accessed directly on CDROMs; they must first be copied to a hard disk, zip drive, flash drive, or other writable medium. We have taught our courses in a laboratory where we are required to place all the exercises on ZIP drives. Although Epi Info and its SAMPLE.MDB are installed in the hard disk in each computer, these files behave as read-only in Student mode, and SAMPLE.MDB must be copied to the ZIP drive for use in the exercises.
- There is a setting in the Epi Info menu for the Working Directory. Since this setting is stored in the Windows Registry, it must be chosen while the computer is accessed in Administrative mode. It should be set to a writable directory, where the MDBs for the exercises are easily found. If the exercises are on ZIP drive D:, then D:\EpiInfoCourseII\ would be a good choice for the Working Directory. Since this merely controls the default working directory, failing to set it is not critical, but it makes finding files much easier for the students.

- Testing should be done under conditions, including security settings, that will be experienced by the class. If at all possible, the entire course should be run as a test. This can be a good way to bring your lab assistant(s) up to speed for teaching the course.

Particularly with Windows XP, installing Service Pack 2 (SP 2) automatically configures the Internet Explorer browser so that popup windows are not allowed, and sometimes so that JavaScript is not allowed to run. This prevents OpenEpi, the extra statistical program provided with these exercises (and even some of Microsoft's own web pages) from running. Try OpenEpi and be sure that the programs work correctly. If not, adjust the popup prevention and other security settings until things work properly. Other popup prevention programs (such as the Google toolbar) can be set to permit popups on designated sites or when running programs from the hard disk rather than the Internet.

Computers

Epi Info for Windows runs on all Microsoft Windows versions except Windows 95 and possibly Windows 98 First Edition. System requirements are given on the Epi Info web site. Any reasonably modern desktop or laptop computer will work, although some computer laboratories may lag behind in providing enough RAM, disk space or processor speed to make learning pleasant. The fact that Windows XP has had only incremental improvements over that past few years has greatly aided teaching, and increasingly Windows XP seems to be the system encountered when teaching courses, a blessing for both classes and instructors.

Printed Materials

The prime resources for these two courses are the course documents. These or any parts thereof, can be printed for class use. If they are translated or reproduced in part, reference to the original source is appropriate, just as with any scientific publication.

The Epi Info HELP files are found on the HELP menu under CONTENTS. Although they cannot easily be printed as a whole, the help files are an extensive reference to the details of Epi Info commands, and should be consulted whenever there is a need for more information. Unfortunately, the help files are sometimes wrong, and they contain many grammatical errors. Don't be afraid to experiment with syntax when that recommended does not work (for example, putting single quotes around a file name sometimes fixes an Analysis command).

Demonstrations

Where possible, the sequence of Introduction, Demonstration, Do-With-Instructions, Do-With-Minimal-Instructions is desired. Depending on the previous experience of the class, demonstrations can be inserted as a quick way of bringing everyone to the same entry point. If the entire class has used Epi Info for Windows previously, there is little reason to demonstrate making a questionnaire View at the beginning of Course II. If half the class, however, has only had experience with SAS or SPSS, then a demonstration can help to provide a solid starting point.

Standard demonstrations, using mostly the tables in SAMPLE.MDB, are found in Introduction to Epi Info for Windows (from www.EpiInformatics.com), which is an enhanced version of what were known originally as Guided Tours.

Compact Disks (CDs)

The courses in this series are packaged in two folders (the Windows name for directories) called EpiInfoCourseI and EpiInfoCourseII. We give each member of our classes a CD ROM with the following contents:

- EpiInfoCourseI
- EpiInfoCourseII
- Install Epi Info (Contains the latest Epi Info setup file and README)
- Maps (Contains shape files of the world, downloaded from www.cdc.gov/epiinfo)
- CDC Exercises (The contents of a 5-day course for Epi Info instructors, given by the Epi Info Development Team, downloaded from www.cdc.gov/epiinfo)
- Introductions
 - Introduction to Epi Info for Windows
 - Introduction to Epi Info Analysis
- OpenEpi (A series of epidemiologic calculators from www.openepi.com that is a Windows replacement for Statcalc)
- Epi Info 6, for those who might want it

Internet

Internet searching is an indispensable part of public health work (or even ordinary conversation for many people). This concept is introduced in Course II, but suitable HTML files are included on the CD ROM so that those without Internet access can share the results, if not perform the actual search.

Other Resources

Other Epi Info teaching resources are listed on the CDC Epi Info site under “Tutorials,” “Websites,” or “Vendors.” Searching with Google.com or other search engines reveals thousands of sites that refer to Epi Info. To find them all, it is important to use “Epi Info” with and without a space between the words and with and without a hyphen, as it is often misspelled.

Help and Collaboration

CDC offers an email and telephone help line on the Epi Info website, with an email address of epiinfo@cdc.gov. Since there is only one person assigned to the help line, the volume of responses is necessarily limited.

CDC also provides an Epi Info WebBoard that can be joined from the www.cdc.gov/epiinfo site. The author has found the WebBoard to be subject to

numerous glitches in recent years, but, when it works, it is an important channel to other users and teachers of Epi Info.

Acknowledgment

Major portions of the section on advanced statistics are taken, with permission, from: Kevin M. Sullivan, PhD, MPH, MHA and Minn Minn Soe, MD, MCTM, MPH
Introduction to Epi Info (Version 3.2.2) Analysis Module
Department of Epidemiology
School of Public Health of Emory University
October 2004
Available from www.sph.emory.edu/~cdckm

Recent Additions to Course I (November 2006)

The brief Rhodococcus exercise in the course manual will work as written, but the HTML tutorial version distributed with Epi Info 3.3.2 is marred by several broken links which make navigation frustrating. We have fixed these and added the revised exercise to the Course I materials in the RhodoEx directory, from which they can be run by double clicking on Rhodococcus.htm to bring it up in a browser.

We have taken the opportunity to revise the section of Rhodococcus that deals with Statcalc so that it can also be used with OpenEpi, the Windows equivalent of the DOS Statcalc. OpenEpi can be downloaded from www.openepi.com or simply run from its website using the links in the Rhodococcus exercise. We include it with the CDROMs that we make for our students.

Versions of Epi Info (March 2007)

An updated version of Epi Info, Version 3.4, is expected from CDC in the near future. It should be compatible with these exercises, as they have been largely tested with the beta version of 3.4.

Problems with Epi Info 3.3.2 and Microsoft Internet Explorer 7 (March 2007)

The 3.4 update of Epi Info works well with Internet Explorer 7 (IE7). However, the previous version does not automatically reload the web pages produced by Analysis in the results panel (which is really IE6 or IE7). If you are using Epi Info 3.3 or earlier and IE7 cannot be avoided, you may find that the latest results do not appear on the screen in Analysis unless you ask the browser to refresh the page by pressing F5. This is the quickest way around the problem, but you can also go to "History" and choose the previous version of the same output, and the refresh will occur. If you are teaching in a university environment, it is possible that the laboratory has not upgraded to IE7 yet, and everything will work smoothly.

Table of Contents for Epi Info Course I Manual

(See EpiInfoCourseI.DOC or PDF for text)

Instructor's or Self Instructor's Manual.....	1
Contents.....	2
Introduction.....	3
Why Use Epi Info?.....	3
Prerequisites.....	4
Obtaining, Installing, and Testing Epi Info.....	4
Computers.....	6
Printed Materials	6
Demonstrations.....	6
Compact Disks (CDs).....	7
Internet.....	7
Other Resources	7
Help and Collaboration.....	7
Acknowledgment.....	8
Recent Additions to Course I (November 2006).....	8
Versions of Epi Info (March 2007).....	8
Problems with Epi Info 3.3.2 and Microsoft Internet Explorer 7 (March 2007).....	8
Table of Contents for Epi Info Course I Manual.....	9
Objectives for Course I.....	10
Course Title.....	10
Epi Info Course I (Introduction to Public Health Computing with Epi Info).....	10
Course Description.....	10
Learning Objectives.....	10
Schedule for Epi Info Course I.....	11
Day 2.....	12
Course Objectives.....	13
Schedule for Epi Info Course II.....	15
Day 1.....	15
Day 2.....	17

Objectives for Course I

Course Title

Epi Info Course I (Introduction to Public Health Computing with Epi Info)

Course Description

Epi Info™ is a public domain software package freely distributed worldwide. Using Epi Info for Microsoft Windows®, students will develop and computerize questionnaires for a bioterrorism investigation, analyze data from acute and chronic disease studies to produce epidemiologic statistics, maps, and graphs, and construct a menu for a permanent information system.

Learning Objectives

At the conclusion of the course, students will be able to:

- a. Define and explain computer and database concepts needed to set up public health information systems
- b. Develop and computerize a questionnaire for an epidemiologic field investigation or survey
- c. Enter and analyze data from both acute and chronic disease studies, producing epidemiologic statistics
- d. Develop graphs and maps to explore time and place, and understand Geographic Information Systems
- e. Access and use statistical calculators on the Internet
- f. Understand how to incorporate questionnaires, data analysis programs, and documentation into a menu as the basis of a permanent information system

Schedule for Epi Info Course I
(See EpiInfoCourseI.DOC or .PDF for text)

Time	Session	What Happens	Materials
Launching the Course			
	Introductions	We meet each other and go over the course objectives and materials.	Course notebook and schedule
	Review of data concepts	Introduction to database and Epi Info concepts.	Epi Info Intro.PPT on CDROM
	Epi Info Demonstration	A whirlwind tour of Epi Info to provide perspective on the software and what will and will not be covered in this course.	Watch the magic screen, and/or "Introduction to Epi Info for Windows" DOC file.
Entering Data			
	Making a questionnaire	An anthrax attack on New York City suggests that we have an <i>immediate</i> need to develop a questionnaire for an epidemiologic study of New Jersey cases and controls. We jointly design a questionnaire and then construct the questionnaire view in Epi Info.	Anthrax in New York Exercise
	Entering data	We enter a few records as a pilot study	Anthrax in New York Exercise
	Adding Check Code	We add some conditions for entering cleaner data and also examine some fancier questionnaires	Anthrax in New York Exercise
	Doing the Case-Control Study	We organize to use copies of the same View and enter the data from the cases and controls	Anthrax in New York Exercise
Analyzing Data			
Time	Session	What Happens	Materials
	Analysis	READING a data table. LISTING the data. Doing FREQUENCIES and TABLES. READING an Excel table. Merging tables from other team members into a single data table for analysis.	Anthrax in New York Exercise
	Seeing results	Analyzing the case control study, using FREQ, TABLES, MEANS, and MATCH. Saving, editing, and running a program.	Anthrax in New York Exercise

Day 2

Graphing and Mapping			
	Graphing	Analyzing Disease Reports	Analysis of Reportable Disease Surveillance Data
	Mapping	What if John Snow had had a Global Positioning System (GPS) instrument in London of 1854?	Demo
	Mapping	Showing the data from the Anthrax study on a downloaded image of New York	Anthrax in New York Exercise
Statistical Calculators			
	Statcalc	Convenient DOS-based epidemiologic calculator	Demo
	OpenEpi	Open Source Internet calculator with links to other programs, statistical tutorials, and searching	Demo www.openepi.com or local copy
Solving Other Epidemiologic Problems			
	An outbreak of serious Hospital Infections	Case control methods and microbiology uncover the source of an epidemic of Rhodococcus after cardiac surgery in a hospital. You use OpenEpi for analysis of summary data, sample size calculations, and random number generation. You analyze the descriptive study and the matched case-control study.	Postoperative Surgical Infections in a Large Hospital www.openepi.com
	General Analytic Methods	Analysis of a mortality database, and techniques for approaching an unfamiliar dataset	Mortality exercise
Constructing a Menu System			
	The Epi Info Menu	Demonstration of Epi Info menu programming as a tool for constructing systems	Instructor's computer and Epi Info main menu
Finishing Up			
	Questions and suggestions	Discussion How will you use Epi Info? Suggestions for future versions.	
	Evaluation		Evaluation form

Table of Contents, Course II Manual

Instructor's or Self Instructor's Manual	1
Contents	2
Introduction	3
Why Use Epi Info?	3
Prerequisites	4
Obtaining, Installing, and Testing Epi Info	4
Computers	6
Printed Materials	6
Demonstrations	6
Compact Disks (CDs)	7
Internet	7
Other Resources	7
Help and Collaboration	7
Acknowledgment	8
Recent Additions to Course I (November 2006)	8
Versions of Epi Info (March 2007)	8
Problems with Epi Info 3.3.2 and Microsoft Internet Explorer 7 (March 2007)	8
Table of Contents for Epi Info Course I Manual	9
Objectives for Course I	10
Course Title	10
Epi Info Course I (Introduction to Public Health Computing with Epi Info)	10
Course Description	10
Learning Objectives	10
Schedule for Epi Info Course I	11
Day 2	12
Course Objectives	13
Schedule for Epi Info Course II	15
Day 1	15
Day 2	17

Epi Info II

Course Objectives

1. Understand common data management problems encountered in community public health or clinical computer systems and their solutions
2. Develop skills in managing, importing exporting, aggregating, merging, backing up, and encrypting data with Epi Info
3. Enhance analytic and statistical skills to include analysis of complex sample data and the use of logistic regression and survival analysis

4. Be able to understand and use relational tables for data entry and analysis in Epi Info
5. Build an Epi Info application with a newly constructed menu
6. Understand and use geographic information in Epi Info

Schedule for Epi Info Course II

(See EpiInfoCourseII.DOC for text)

Day 1

Time	Session	What Happens	Materials
Launching the Course		Files in ... \EpiInfoCourseII\	
	Introductions	Introduction of Instructors and Class Members	
	The Plan	Review of Objectives, Materials, and Schedule	Course notebook and schedule in EpiInfoCourseII.doc
	Review of concepts	Epidemiology from an Internet Café. Review of database and Epi Info concepts.	InternetCafe.PPT on CDROM

Solving Data Management Problems in a Community Health Department or Clinic			
Files in ... \EpiInfoCourseII\exDataManagement\			
	Problem 1	Working with Excel Files	Restaurants.xls:AprilWK2
	Problem 2	Importing a Text File	HospitalCommas.txt HospitalTabs.txt HospitalFixed.txt READFIXED.PGM
	Problem 3	Monitoring and Managing Hard Disk Space	MyComputer program on your computer
	Problem 4	FoxPro System and Departed Contractor	Patients.dbf
	Problem 5	Computer Viruses	Discussion
	Problem 6	Backing Up and Restoring Data	Discussion
	Problem 7	Sending Confidential Files	Orders.Wk34.xls
	Problem 8	Adding a New Field and New Data to Existing Views	Surveillance.mdb:viewSurveillance
	Problem 9	Merging Data from Multiple Offices	Central.mdb Local1.mdb Local2.mdb

Statistics—Advanced Data Analysis		Files in ... \EpiInfoCourseII\exStatistics\	
	Statistics 1	Obtaining Historical Data	Internet access to www.openepi.com or use the htm files in ... \EpiInfoCourseII\exStatistics
	Statistics 2	Analyzing a Community Cluster Survey	Sample.mdb: viewEpi1 and viewEpi10

	Statistics 3	Finding Relationships among Three or More Variables	Sample.mdb: viewOswego
	Statistics 4	Logistic Regression and a Classical Heart Disease Study	Sample.mdb: viewEvansCounty
	Statistics 5	Followup Study of a Clinical Drug Trial—Survival Analysis	Sample.mdb:viewAnderson

Day 2

Related Views and Data Tables		Files in ... \EpiInfoCourseII\exRelated\	
Time	Session	What Happens	Materials
		Creating Views and Entering Relational Data	What's a Record? Introduction to the Related View Exercise
		Analyzing Relational Data	Related.mdb
	Goal 1	Relating Mother and Child Views and Calculating Mother's Age at Child's Birth	Related.mdb Goal1.pgm
	Goal 2	Using SUMMARIZE to Find Date of First Positive HIV Test for Each Mother	Related.mdb Goal2.pgm
	Goal 3	Finding Rate of HIV Transmission to Child from HIV-Positive Mothers	Related.mdb Goal2.pgm
		Adding Alternative Keys in a Relational System (Optional)	Related.mdb Goal2.pgm

Menus and Permanent Applications		Files in ... \EpiInfoCourseII\exStatistics\	
	Menu 1	Making a Menu	ClickHereToRunMak emenu, MakeMenu.mnu
	Menu 2	Configuring the Menu to Include New Features	Files from exRelated

Geographic Information Systems (GIS)		Files in ... \EpiInfoCourseII\exGIS\	
	GIS 1	Mapping Points in Epi Map Animals Tested by County Displaying Positive Rabies Tests by Point Coordinates	GISData.MDB:Rabies s2003
	GIS 2	Mapping Categorical Data in Epi Map	PositiveBirds2003.X LS
	GIS 3	Editing or Creating Shape Files Creating a New Shape File by Combining Polygons from Others Making an Entirely New Shape File Based on an Image	WV.shp PA.shp OH.shp Charleston1996.jpg

Finishing Up			
	Questions and suggestions	Class discussion.	
	Evaluation		Evaluation form