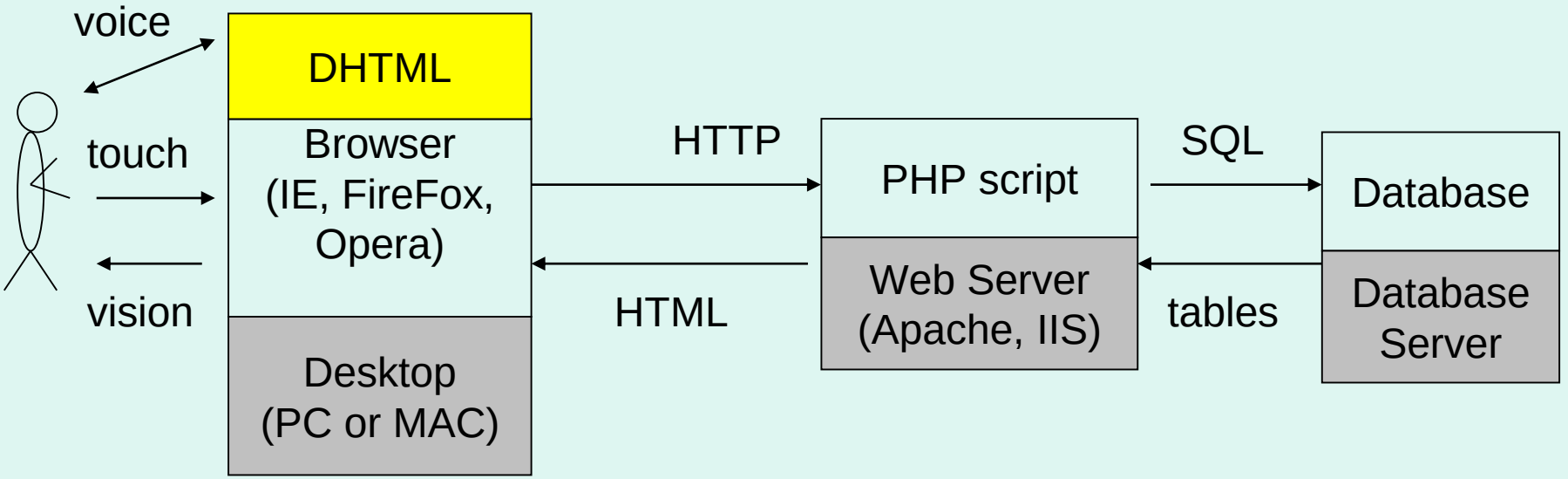
TSWRAFPDCW, Bhongir
Department of Computer Science

3-Tier Architecture and PHP Scripting

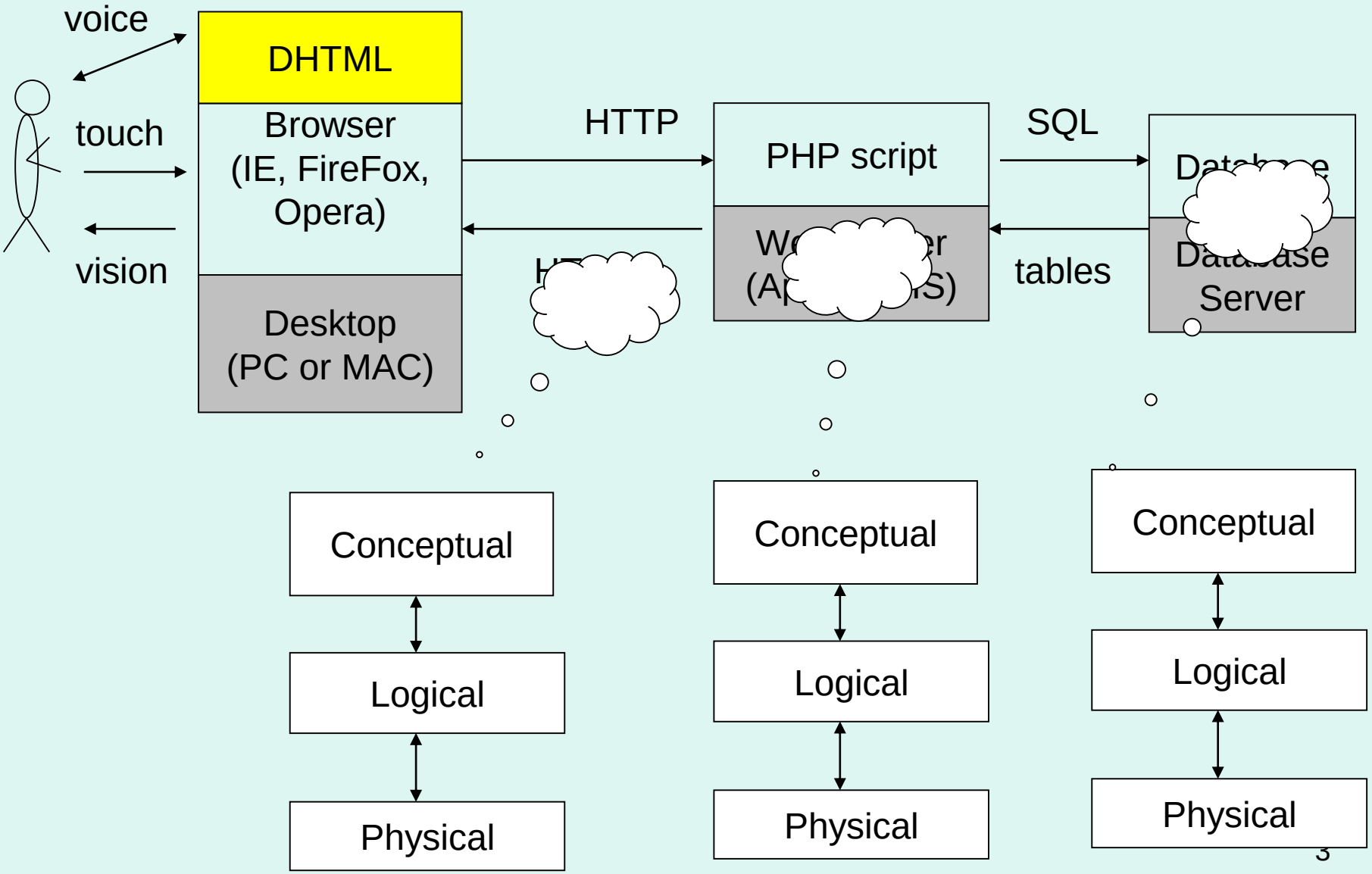
3(+1) Tier architecture



Presentation Layer

Application Layer

Persistence Layer


voice
touch
vision
DHTML
Browser
(IE, FireFox,
Opera)
Desktop
(PC or MAC)
HTTP
PHP script
SQL
tables
Database
Server
Conceptual
Logical
Physical
Conceptual
Logical
Physical
Conceptual
Logical
Physical

Dynamic Web page needed when:

- consistent look and feel on each page of a large site is required
- data is derived from a database
- content depends on real time
- content depend on user choice
- business transactions e.g. e-commerce…

3-tier architecture

- A **Presentation** layer using Browser technology
- An **Application** layer using a web application server platform + application programs
- A **Persistence** layer using a relational database or other data store technology

Presentation layer arch

- Decoding URLs : protocol/host/file
  - Host name converted to IP address(164.11.8.19)
  - www.dnsstuff.com
- Issue request to remote server using appropriate protocol (usually HTTP)
- accept the returned HTML (or JPEG, ..) file
- Issue requests for any embedded links (
- render (i.e. create a 2-d image) the HTML
- allow plug-ins to handle new file types
- execute client-side scripts in JavaScript
- support interaction between client-side scripts and the web page (DHTML)
- accept user input via a variety of controls on a form

Persistence layer arch

- interaction with the database using standard languages e.g. SQL queries using database-specific protocol over TCP/IP
- define and modify the data structures (e.g. tables) themselves (the Database Schema)
- insert, update and delete data
- maintain data persistently, with backup and recovery
- handle transactions to support **concurrent** access to the database via locking et
- optimise access by compilation of queries, indexing, replication of tables etc.

Application Layer arch

- Server (Apache, IIS)
  - Identifying appropriate action to take – fetch a file, pass request to an interpreter
  - Sending output back to caller in MIME package
  - Support for:
    - thousands of concurrent users
    - multi-threading [allow multiple processes to run concurrently]
    - caching [holding results in a temporary store to reduce re-calculation]

- Server Script (e.g. in PHP)
  - Interacting with the server (accessing input and generating output)
  - interpreting the requests according to business rules and past transactions from this client
  - requesting the appropriate data from the Persistence layer
  - computing derived data
  - creating the HTML (or GIF, MIDI..) for the page

Scripting languages

- A scripting language is:
  - often evolved not designed
  - cross-platform since interpreter is easy to port
  - designed to support a specific task – PHP -> Web support
  - un-typed variables (but values are typed)
  - implicit variable declaration
  - implicit type conversion
  - stored only as script files
  - compiled on demand
  - may run on the server (PHP) or the client (JavaScript)

PHP details

- Procedural language
  - Compare with JavaScript which is event-driven
- C-like syntax - { } ;
- Extensive Function Library
- Good Web-server integration
  - Script embedded in HTML
  - Easy access to form data and output of HTML pages
- Not fully object-oriented
  - Java is fully object oriented – all functions have to be in a class
  - In PHP, classes are additional but quite simple to use

PHP and HTML

- **HTML-embedded**
  - PHP scripts are essentially HTML pages with the occasional section of PHP script.
  - PHP script is enclosed in the tag pair:
    - <h2><?php print date(“H:I”) ?></h2>

C-like language

- Free format - white space is ignored
- Statements are terminated by semi-colon ;
- Statements grouped by { … }
- Comments begin with // or a set of comments /* */
- Assignment is '=': $a=6
- Relational operators are ,< , > == (not a single equal)
- Control structures include if (cond) {..} else { }, while (cond) { .. } , for(sstartcond; increment; endcond) { }
- Arrays are accessed with [ ] : $x[4] is the 5th element of the array $x – indexes start at 0
- Associative Arrays (hash array in Perl, dictionary in Java) are accessed in the same way: $y["fred"]
- Functions are called with the name followed by arguments in a fixed order enclosed in ( ) : substr("fred",0,2)
- Case sensitive - $fred is a different variable to $FRED

Function library

- Basic tasks
  - String Handling
  - Mathematics – random numbers, trig functions..
  - Regular Expressions
  - Date and time handling
  - File Input and Output
- And more specific functions for-
  - Database interaction –
    - MySQL, Oracle, Postgres, Sybase, MSSQL ..
  - Encryption
  - Text translation
  - Spell-checking
  - Image creation
  - XML

String Handling

- String literals (constants) enclosed in double quotes “ ” or single quotes ‘ ’
- Within “”, variables are replaced by their value: – called *variable interpolation*. “My name is $name, I think”
- Within single quoted strings, interpolation doesn’t occur
- Strings are concatenated (joined end to end) with the dot operator “key”.”board” == “keyboard”
- Standard functions exist: strlen(), substr() etc
- Values of other types can be easily converted to and from strings – numbers implicitly converted to strings in a string context.
- Regular expressions be used for complex pattern matching.

THANK YOU

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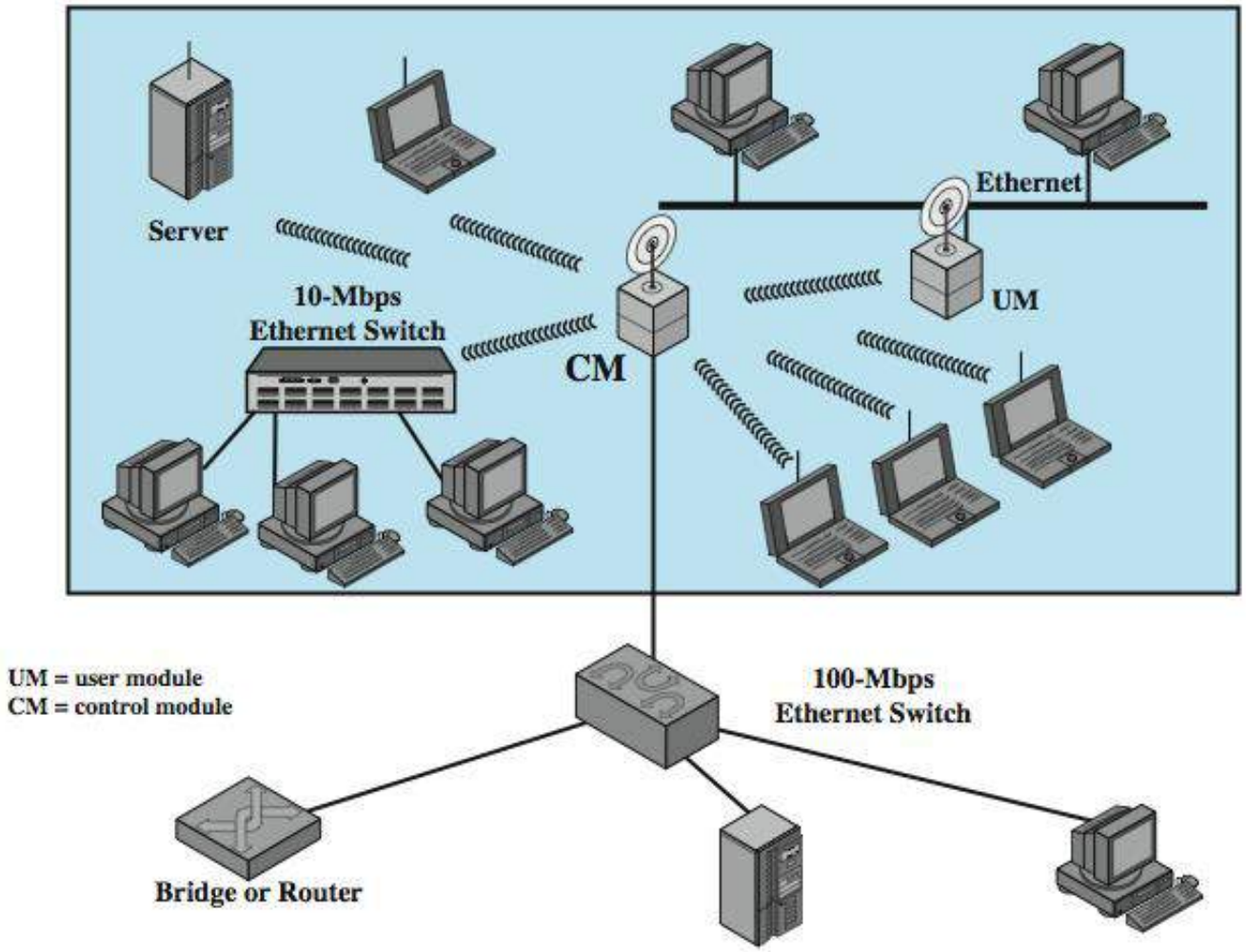
Wireless LANs

Data and Computer Communications

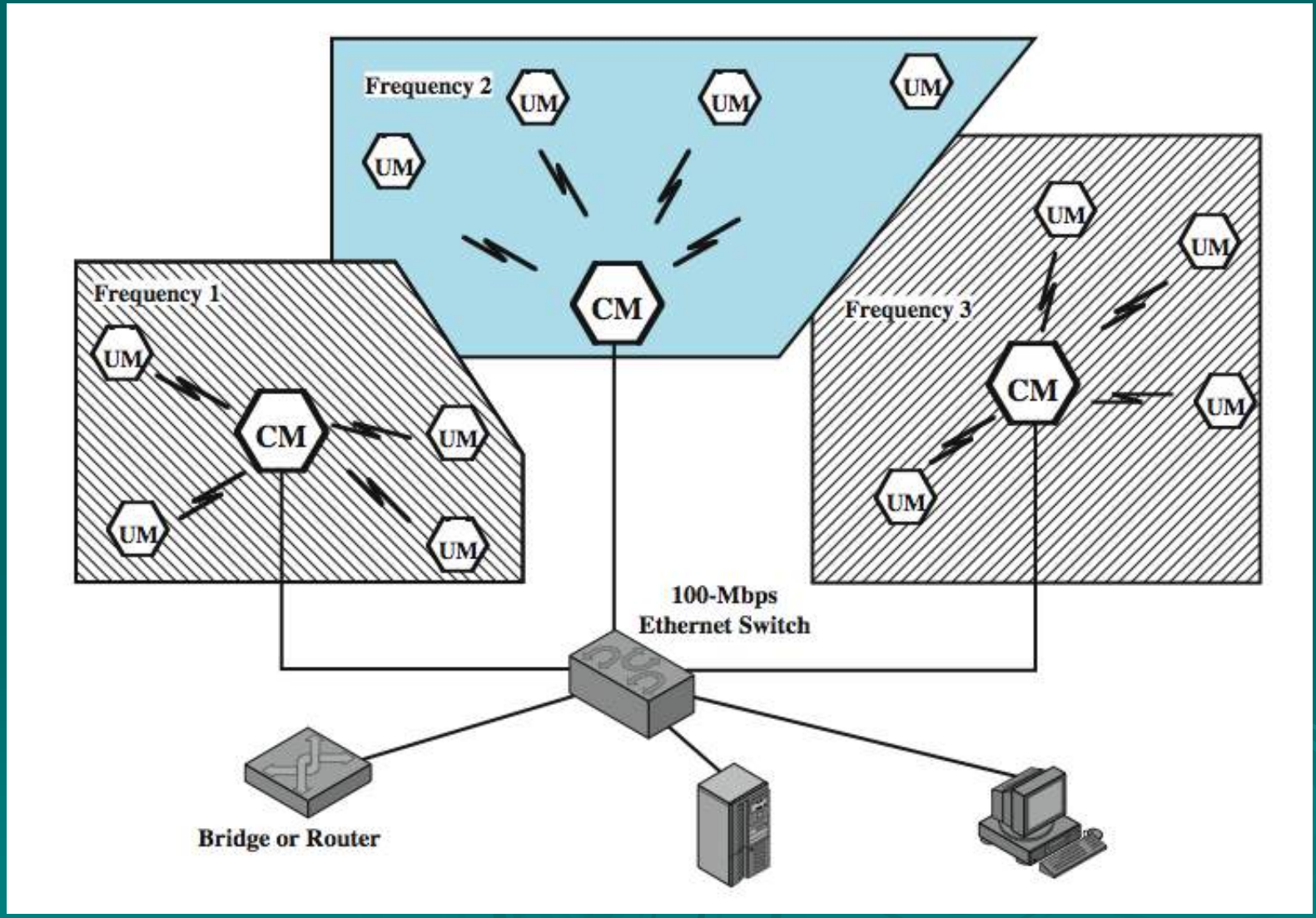
Overview of Wireless LANs

- use wireless transmission medium
- issues of high prices, low data rates, occupational safety concerns, & licensing requirements now addressed
- key application areas:
  - LAN extension
  - cross-building interconnect
  - nomadic access
  - ad hoc networking

Single Cell LAN Extension



Multi Cell LAN Extension



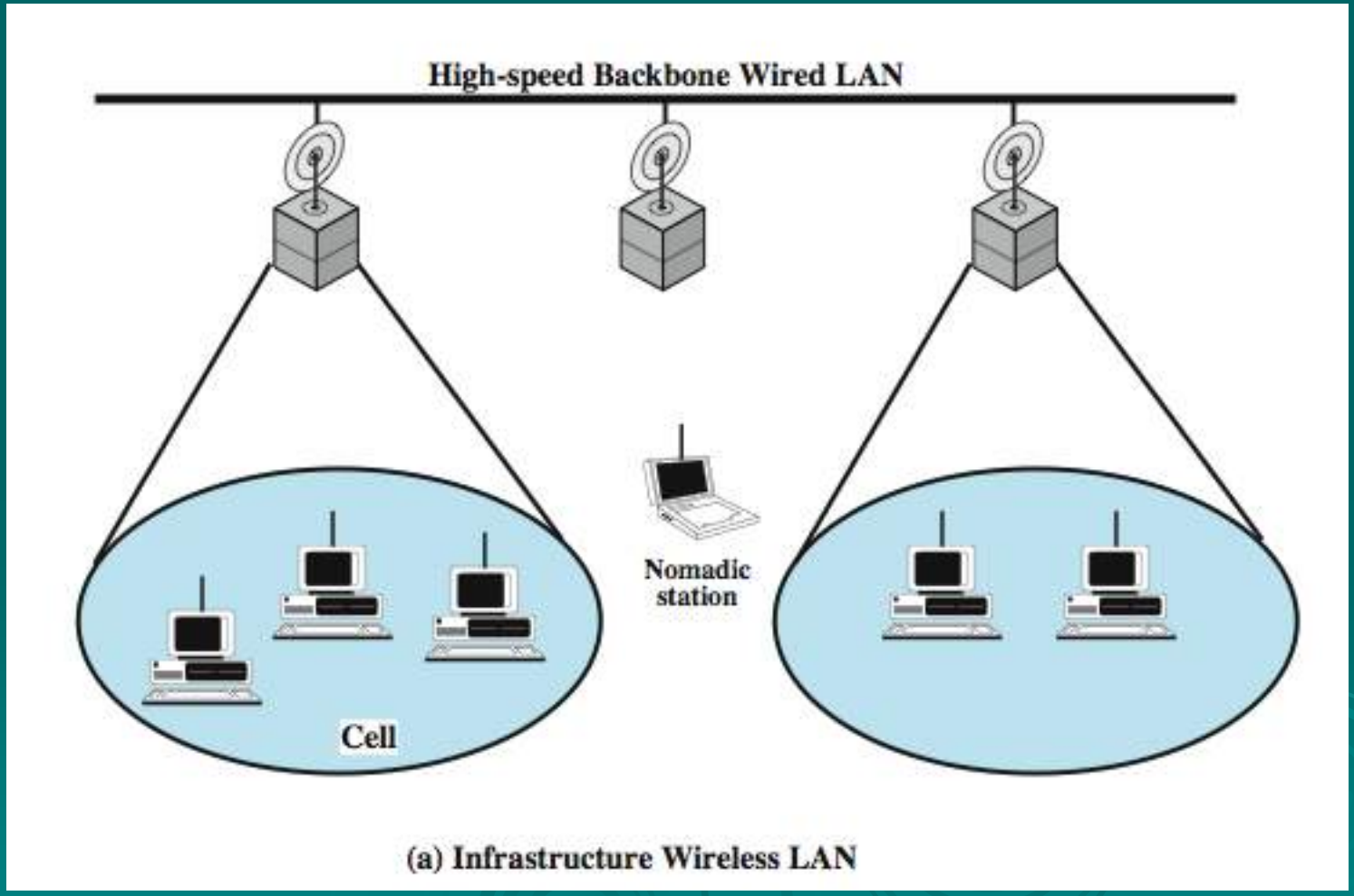
Cross-Building Interconnect

- connect LANs in nearby buildings
- point-to-point wireless link
  - Not a LAN per se
- connect bridges or routers

Nomadic Access

- link LAN hub & mobile data terminal
  - laptop or notepad computer
  - enable employee to transfer data from portable computer to server
- also useful in extended environment such as campus or cluster of buildings
  - users move around with portable computers
  - may wish access to servers on wired LAN

Infrastructure Wireless LAN

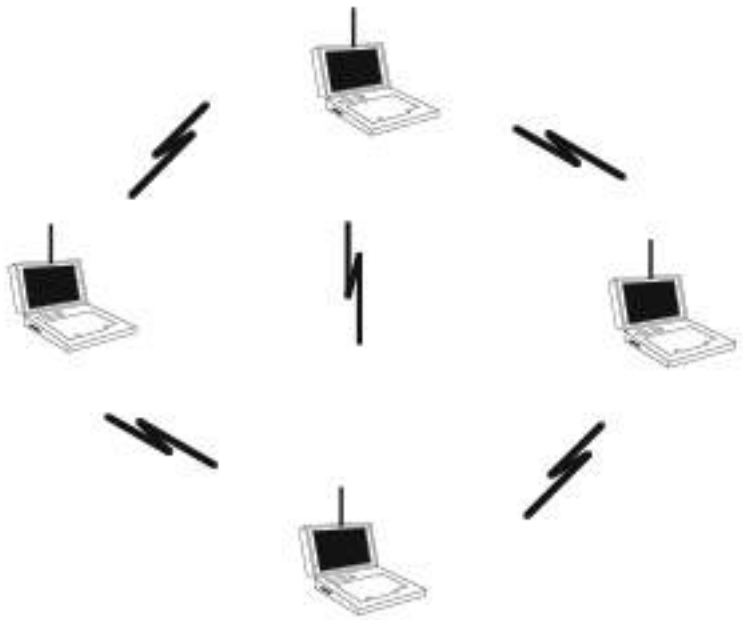


Note

A BSS(basic service set) without an AP (access point)is called an ad hoc network;
a BSS with an AP is called an infrastructure network.

Ad Hoc Networking

- temporary peer-to-peer network



(b) Ad hoc LAN

Wireless LAN Requirements

- throughput - efficient use wireless medium
- no of nodes - hundreds of nodes across multiple cells
- connection to backbone LAN - using control modules
- service area - 100 to 300 m
- low power consumption - for long battery life on mobiles
- transmission robustness and security
- collocated network operation
- license-free operation
- handoff/roaming
- dynamic configuration - addition, deletion, and relocation of end systems without disruption to users

Technology

- infrared (IR) LANs
  - individual cell of IR LAN limited to single room
  - IR light does not penetrate opaque walls
- spread spectrum LANs
  - mostly operate in ISM (industrial, scientific, and medical) bands
  - no Federal Communications Commission (FCC) licensing is required in USA
- narrowband microwave
  - microwave frequencies but not use spread spectrum
  - some require FCC licensing

Infrared LANs

- constructed using infrared portion of spectrum
- strengths
  - spectrum virtually unlimited hence high rates possible
  - unregulated spectrum
  - infrared shares some properties of visible light
    - reflection covers room, walls isolate networks
  - inexpensive and simple
- weaknesses
  - background radiation, e.g. sunlight, indoor lighting
  - power limited by concerns for eye safety and power consumption

Infrared LANs Transmission Techniques

- directed-beam IR
  - point-to-point links
  - range depends on power and focusing
  - for indoor use can set up token ring LAN
  - IR transceivers positioned so data circulates in ring
- omnidirectional
  - single base station with line of sight to other stations
  - acts as a multiport repeater
  - other stations use directional beam to it
- diffused configuration
  - stations focused / aimed at diffusely reflecting ceiling

Thank You

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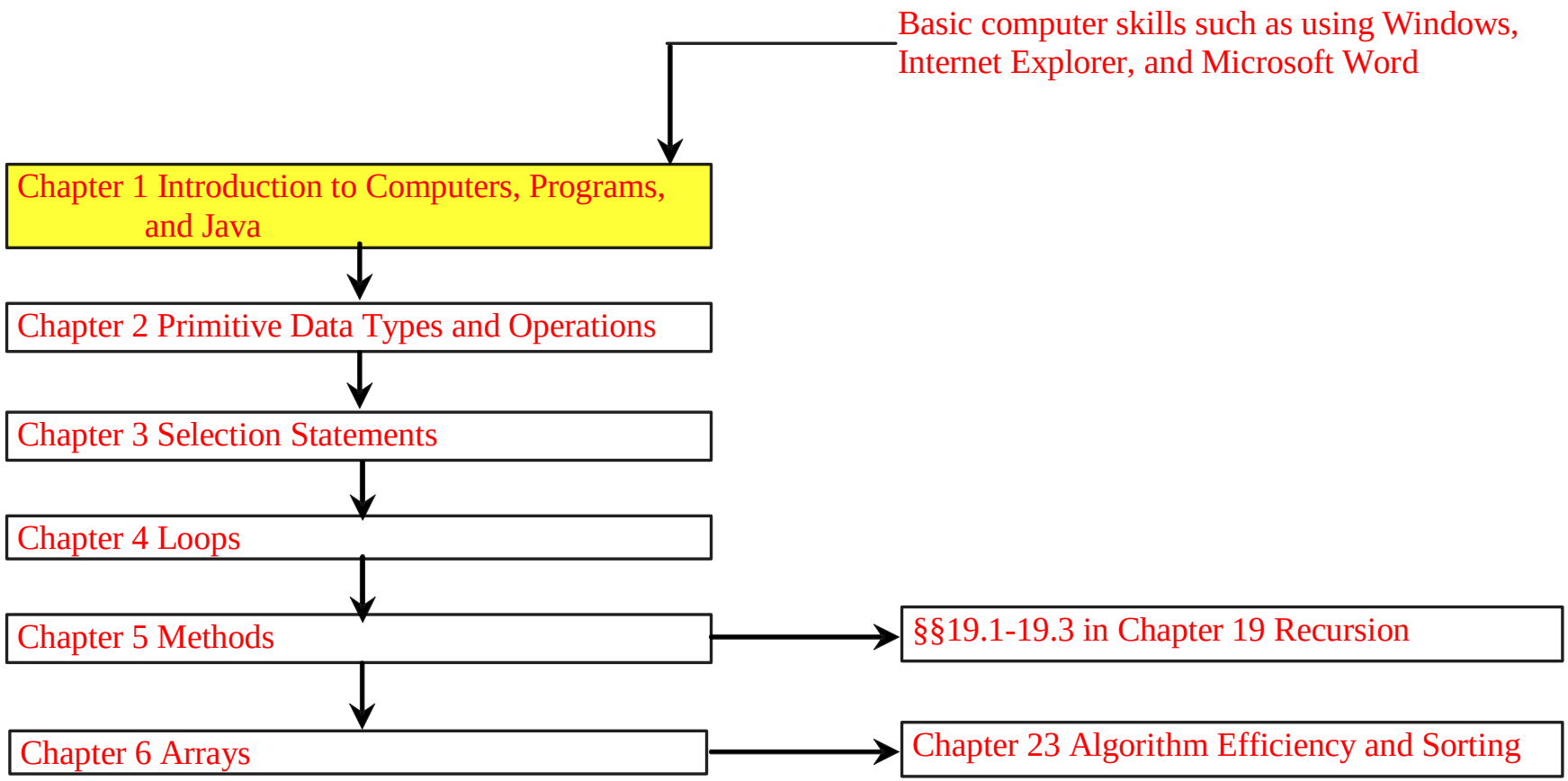
PROGRAMMING WITH JAVA

Chapter 1 Introduction to Java



Why Java?

The answer is that Java enables users to develop and deploy applications on the Internet for servers, desktop computers, and small hand-held devices. The future of computing is being profoundly influenced by the Internet, and Java promises to remain a big part of that future. Java is the Internet programming language.

- Java is a general purpose programming language.
- Java is the Internet programming language.

Java, Web, and Beyond

- Java can be used to develop Web applications.
- Java Applets
- Java Servlets and JavaServer Pages
- Java can also be used to develop applications for hand-held devices such as Palm and cell phones

Java's History

- James Gosling and Sun Microsystems
- Oak
- Java, May 20, 1995, Sun World
- HotJava
  - The first Java-enabled Web browser
- Early History Website:

http://java.sun.com/features/1998/05/birthday.html

Characteristics of Java

- Java Is Simple
- Java Is Object-Oriented
- Java Is Distributed
- Java Is Interpreted
- Java Is Robust
- Java Is Secure
- Java Is Architecture-Neutral
- Java Is Portable
- Java's Performance
- Java Is Multithreaded
- Java Is Dynamic

www.cs.armstrong.edu/liang/intro6e/JavaCharacteristics.pdf

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Java is partially modeled on C++, but greatly simplified and improved. Some people refer to Java as "C++--" because it is like C++ but with more functionality and fewer negative aspects.

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Java is inherently object-oriented. Although many object-oriented languages began strictly as procedural languages, Java was designed from the start to be object-oriented. Object-oriented programming (OOP) is a popular programming approach that is replacing traditional procedural programming techniques.

One of the central issues in software development is how to reuse code. Object-oriented programming provides great flexibility, modularity, clarity, and reusability through encapsulation, inheritance, and polymorphism.

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Distributed computing involves several computers working together on a network. Java is designed to make distributed computing easy. Since networking capability is inherently integrated into Java, writing network programs is like sending and receiving data to and from a file.

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You need an interpreter to run Java programs. The programs are compiled into the Java Virtual Machine code called bytecode. The bytecode is machine-independent and can run on any machine that has a Java interpreter, which is part of the Java Virtual Machine (JVM).

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Java compilers can detect many problems that would first show up at execution time in other languages.

Java has eliminated certain types of error-prone programming constructs found in other languages.

Java has a runtime exception-handling feature to provide programming support for robustness.

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Java implements several security mechanisms to protect your system against harm caused by stray programs.

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Write once, run anywhere

With a Java Virtual Machine (JVM), you can write one program that will run on any platform.

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Because Java is architecture neutral, Java programs are portable. They can be run on any platform without being recompiled.

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Java's performance Because Java is architecture neutral, Java programs are portable. They can be run on any platform without being recompiled.

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Multithread programming is smoothly integrated in Java, whereas in other languages you have to call procedures specific to the operating system to enable multithreading.

Characteristics of Java

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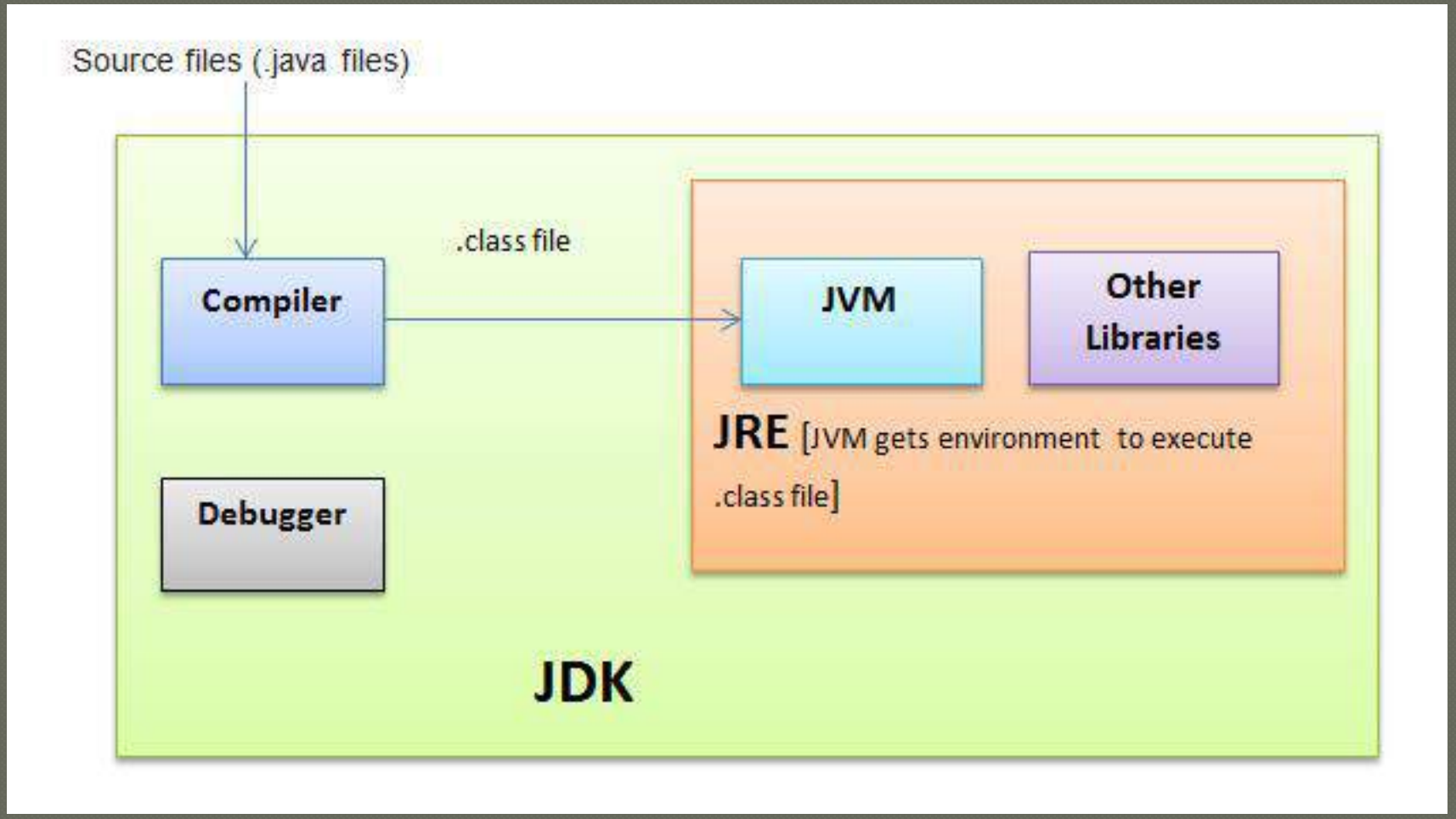
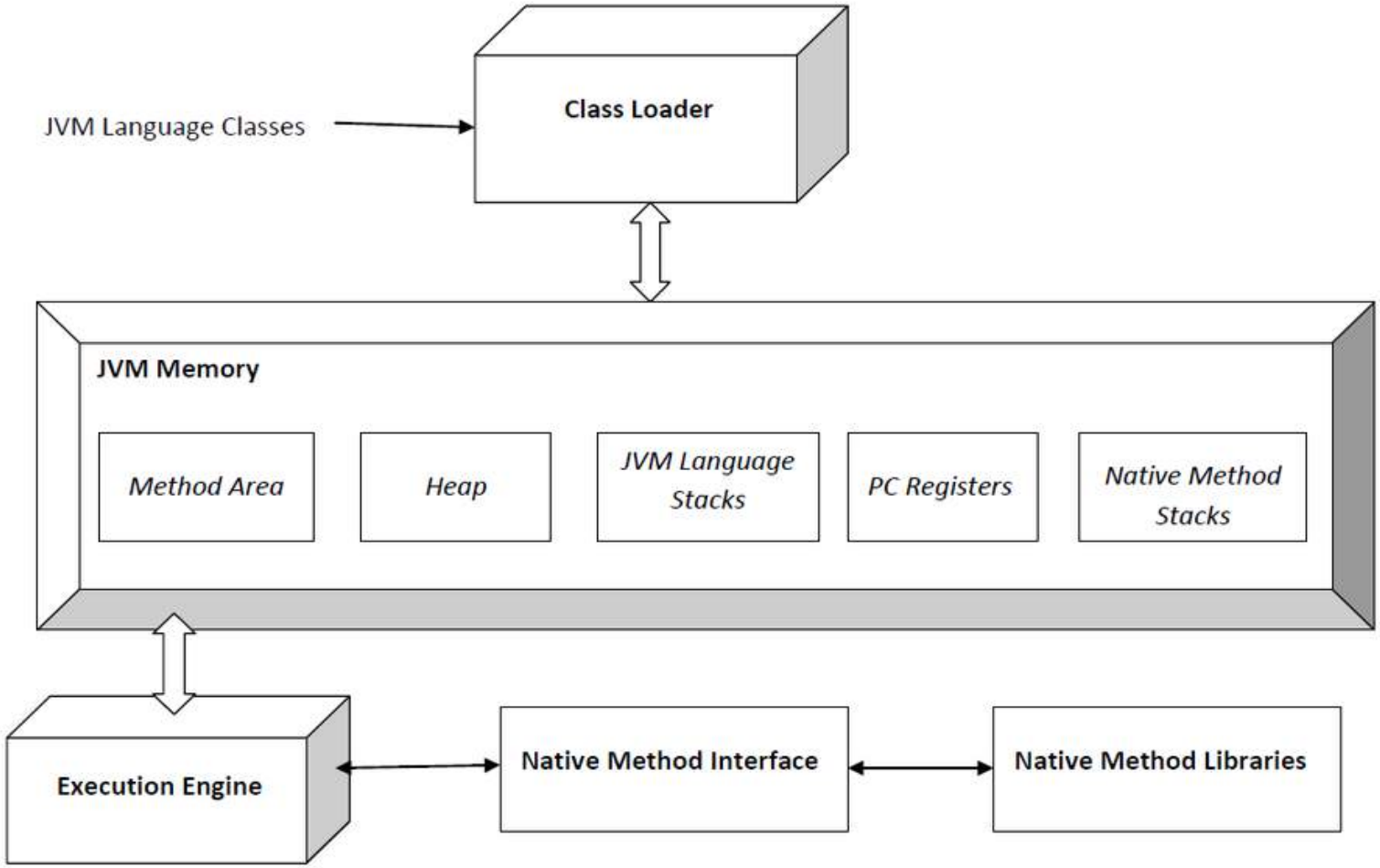
Java was designed to adapt to an evolving environment. New code can be loaded on the fly without recompilation. There is no need for developers to create, and for users to install, major new software versions. New features can be incorporated transparently as needed.

Java Virtual Machine



Overview of the architecture of JVM

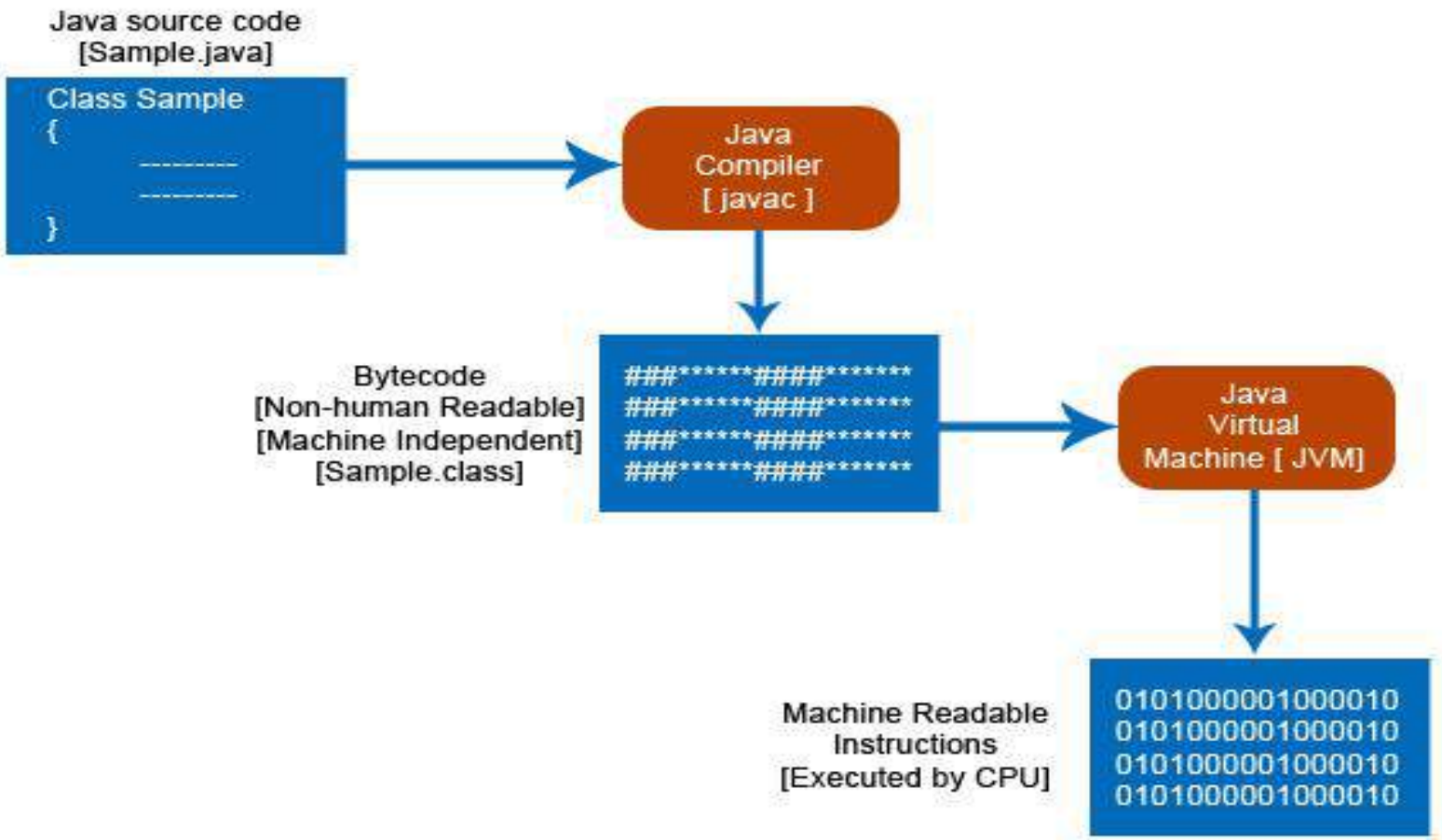


Life cycle of a Java Program

There are three main stages in the life cycle of a java program.
They are:

- Editing the program
- Compiling the source code
- Executing the byte code

Life cycle of a Java Program Contd…



Java both Interpreted and Compiled Language

Programming languages are classified as Higher Level Language Ex. C++, Java

A **compiler** is a program which converts a program from one level of language to another. Example conversion of C++ program into machine code.
The java compiler converts high-level java code into bytecode (which is also a type of machine code).

An **interpreter** is a program which converts a program at one level to another programming language at the **same level.** Example conversion of Java program into C++

In Java, the Just In Time Code generator converts the bytecode into the native machine code which are at the same programming levels.
Hence, Java is both compiled as well as interpreted language.

Data Types

Java defines eight simple types:

1)byte – 8-bit integer type
2)short – 16-bit integer type
3)int – 32-bit integer type
4)long – 64-bit integer type
5)float – 32-bit floating-point type
6)double – 64-bit floating-point type
7)char – symbols in a character set
8)boolean – logical values true and false

Data Types Contd….

- byte: 8-bit integer type.
  Range: -128 to 127.
  Example: byte b = -15;
  Usage: particularly when working with data streams.
- short: 16-bit integer type.
  Range: -32768 to 32767.
  Example: short c = 1000;
  Usage: probably the least used simple type.

Data Types Contd….

- **int:** 32-bit integer type.

  Range: -2147483648 to 2147483647.

  Example: int b = -50000;

  Usage:

  1) Most common integer type.

  2) Typically used to control loops and to index arrays.

  3) Expressions involving the byte, short and int values are promoted to int before calculation.

Data Types Contd….

- **long:** 64-bit integer type.
  Range: -9223372036854775808 to 9223372036854775807.
  Example: long l = 10000000000000000;
  Usage: l) useful when int type is not large enough to hold the desired value

- **float:** 32-bit floating-point number.
  Range: 1.4e-045 to 3.4e+038.
  Example: float f = 1.5;
  Usage:
  1) fractional part is needed
  2) large degree of precision is not required

Data Types Contd….

- **double:** 64-bit floating-point number.

  Range: 4.9e-324 to 1.8e+308.

  Example: double pi = 3.1416;

  Usage:

  1) accuracy over many iterative calculations

  2) manipulation of large-valued numbers

Data Types Contd….

char: 16-bit data type used to store characters.

Range: 0 to 65536.

Example: char c = ‘a’;

Usage:

1) Represents both ASCII and Unicode character sets; Unicode defines a

character set with characters found in (almost) all human languages.

2) Not the same as in C/C++ where char is 8-bit and represents ASCII only.

Data Types Contd….

- **boolean:** Two-valued type of logical values.

  Range: values true and false.

  Example: boolean b = (1<2);

  Usage:

  1) returned by relational operators, such as 1<2

  2) required by branching expressions such as if or for

Type Conversion

- Size Direction of Data Type
  - Widening Type Conversion (Casting down)
    - Smaller Data Type → Larger Data Type
  - Narrowing Type Conversion (Casting up)
    - Larger Data Type → Smaller Data Type
- Conversion done in two ways
  - Implicit type conversion
    - Carried out by compiler automatically
  - Explicit type conversion
    - Carried out by programmer using casting

Type Conversion

- Widening Type Converstion
  - Implicit conversion by compiler automatically

byte -> short, int, long, float, double
short -> int, long, float, double
char -> int, long, float, double
int -> long, float, double
long -> float, double
float -> double

Type Conversion

- Narrowing Type Conversion
  - Programmer should describe the conversion explicitly

byte -> char
short -> byte, char
char -> byte, short
int -> byte, short, char
long -> byte, short, char, int
float -> byte, short, char, int, long
double -> byte, short, char, int, long, float

Type Conversion

- byte and short are always promoted to int
- if one operand is long, the whole expression is promoted to long
- if one operand is float, the entire expression is promoted to float
- if any operand is double, the result is double

Type Casting

- What is Type Casting?
  - Assigning a value of one primitive data type to another.
  - Be aware of the compatibility of the data type
- There are two types of casting in Java as follows:
  - **Widening Casting (automatically)**
  - **Narrowing Casting (manually)**
- General form: (targetType) value
- Examples:
- 1) integer value will be reduced module bytes range:
  int i; byte b = (byte) i;
- 2) floating-point value will be truncated to integer value:
  float f; int i = (int) f;

Control Statements

- Java control statements cause the flow of execution to advance and branch based on the changes to the state of the program.
- Control statements are divided into three groups:
- 1) selection statements allow the program to choose different parts of the execution based on the outcome of an expression
- 2) iteration statements enable program execution to repeat one or more statements
- 3) jump statements enable your program to execute in a non-linear fashion

Selection Statements

- Java selection statements allow to control the flow of program's execution based upon conditions known only during run-time.

- Java provides four selection statements:
  1) if
  2) if-else
  3) if-else-if
  4) switch

Iteration Statements

- Java iteration statements enable repeated execution of part of a program until a certain termination condition becomes true.

- Java provides three iteration statements:
  1) while
  2) do-while
  3) for

Jump Statements

- Java jump statements enable transfer of control to other parts of program.
- Java provides three jump statements:
  1) break
  2) continue
  3) return
- In addition, Java supports exception handling that can also alter the control flow of a program.

Thank You

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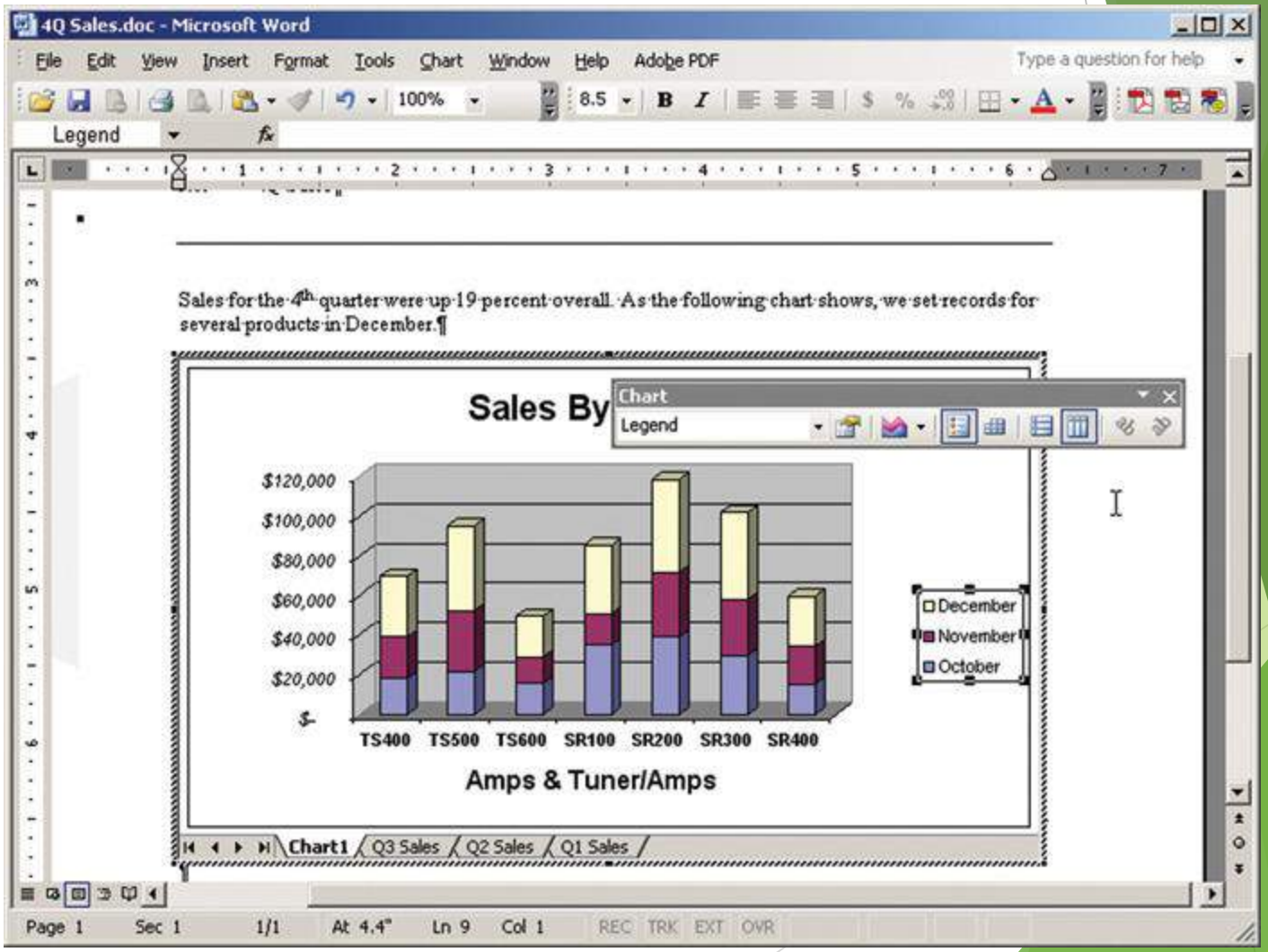
PRODUCTIVITY SOFTWARE

Acquiring Software

- Commercial software
  - Software that must be purchased
  - Stand alone products
    - Solve one type of problem
  - Software suites
    - Integrated tools that work together
    - Solve many problems
  - Shareware
    - Try before you buy
    - May deactivate if not purchased

Software Suite



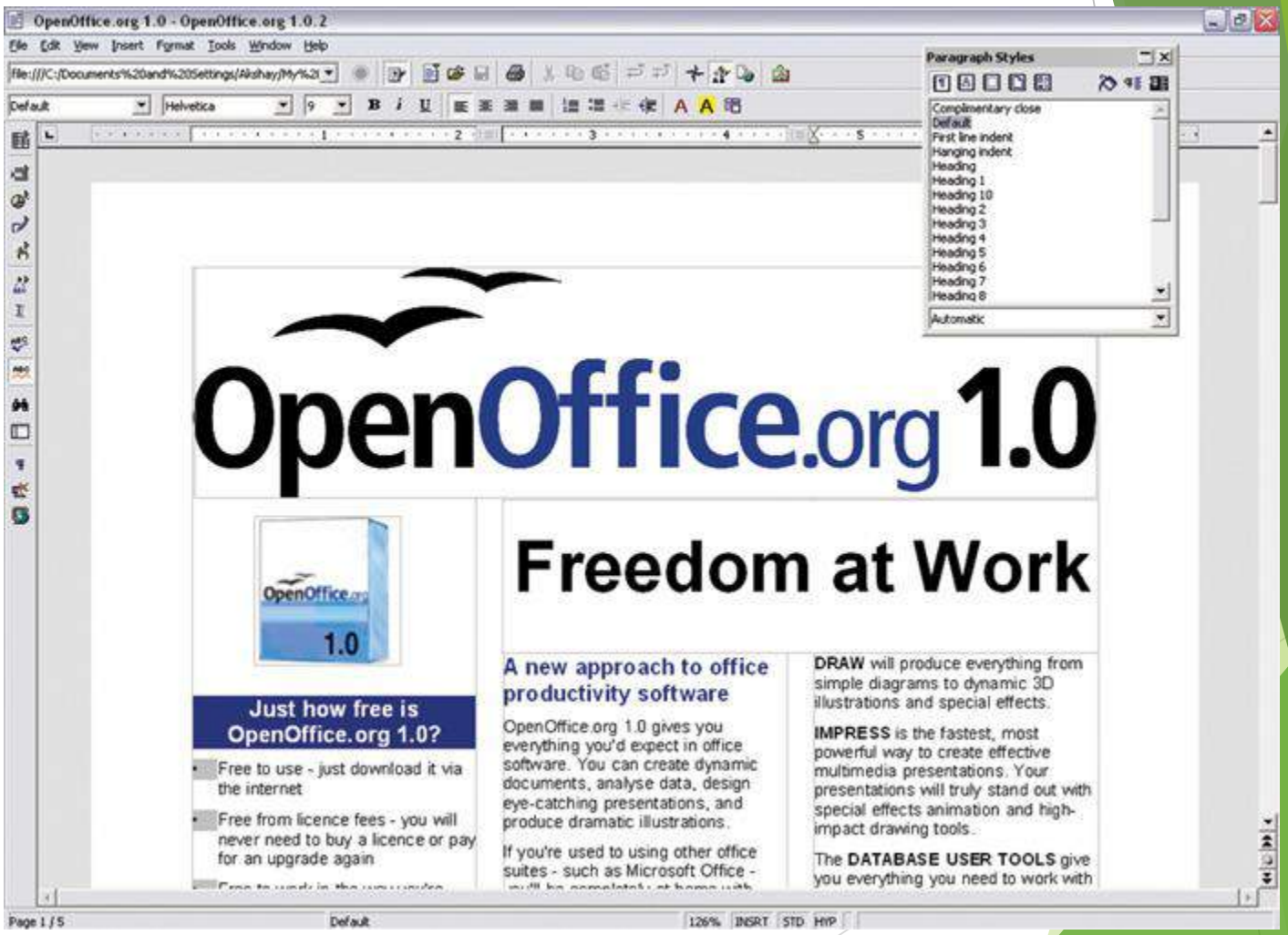
Acquiring Software

- Freeware
  - No obligation to purchase
    - Donations often accepted
  - Software may be distributed freely
  - Public domain software

Acquiring Software

- Open source
  - Programs distributed with source code
  - Allows users to modify the software
  - Modifications and comments are welcome
  - Linux and OpenOffice

Open Office


OpenOffice.org 1.0 - OpenOffice.org 1.0.2
File Edit View Insert Format Tools Window Help
Paragraph Styles
Complimentary close
Default
First line indent
Hanging indent
Heading
Heading 1
Heading 10
Heading 2
Heading 3
Heading 4
Heading 5
Heading 6
Heading 7
Heading 8
Automatic
OpenOffice.org 1.0
Freedom at Work
Just how free is OpenOffice.org 1.0?
Free to use - just download it via the internet
Free from licence fees - you will never need to buy a licence or pay for an upgrade again
A new approach to office productivity software
OpenOffice.org 1.0 gives you everything you'd expect in office software. You can create dynamic documents, analyse data, design eye-catching presentations, and produce dramatic illustrations.
If you're used to using other office suites - such as Microsoft Office -
DRAW will produce everything from simple diagrams to dynamic 3D illustrations and special effects.
IMPRESS is the fastest, most powerful way to create effective multimedia presentations. Your presentations will truly stand out with special effects animation and high-impact drawing tools.
The DATABASE USER TOOLS give you everything you need to work with
Page 1 / 5
Default
126%
INSRT
STD
HYP

Word Processing Programs

- Creates text documents
- Graphics and other objects are supported
- Professional quality can be achieved
- Simple web pages may be created

Word Processing Programs

- Interface
  - Document area
  - Menu bar
  - Toolbars
  - Rulers
  - Scroll bars
  - Status bars

Word Processing Programs

- Entering and editing text
  - Text is entered by typing
  - Cursor indicates position
  - Blocks of text can be manipulated
  - Most other programs include text tools

Word Processing Programs

- Formatting text
  - Controls the document's appearance
  - Character formatting tools
    - Fonts
    - Type style
  - Paragraph formatting tools
    - Line spacing
    - Tabs
  - Document formatting tools
    - Margins
    - Headers

Spreadsheet Programs

- Calculates numbers and finances
- Data viewable in many ways
  - Tables
  - Graphs
- Complex calculations can be automated

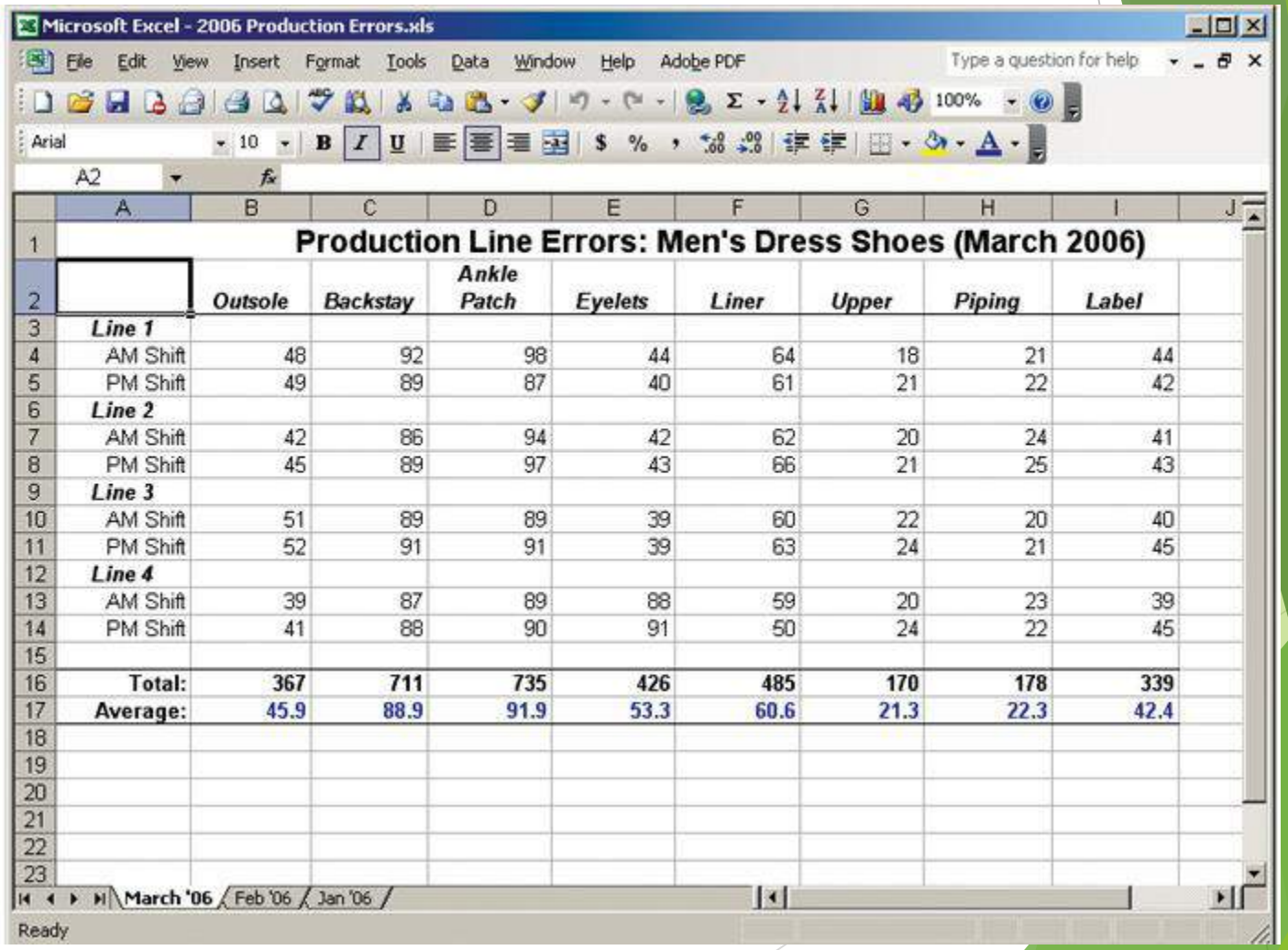
Spreadsheet Programs

- Interface
  - Rows, columns and cells
    - Cell holds data or formulas
  - Formula bar
  - Labels describe cell contents
  - Values
  - Dates
  - Formulas

Presentation Programs

- Creates slides or transparencies
- Complete set is a presentation
- Enhances a speech or lecture
- Color and animation enhance the slides

Spreadsheet Interface



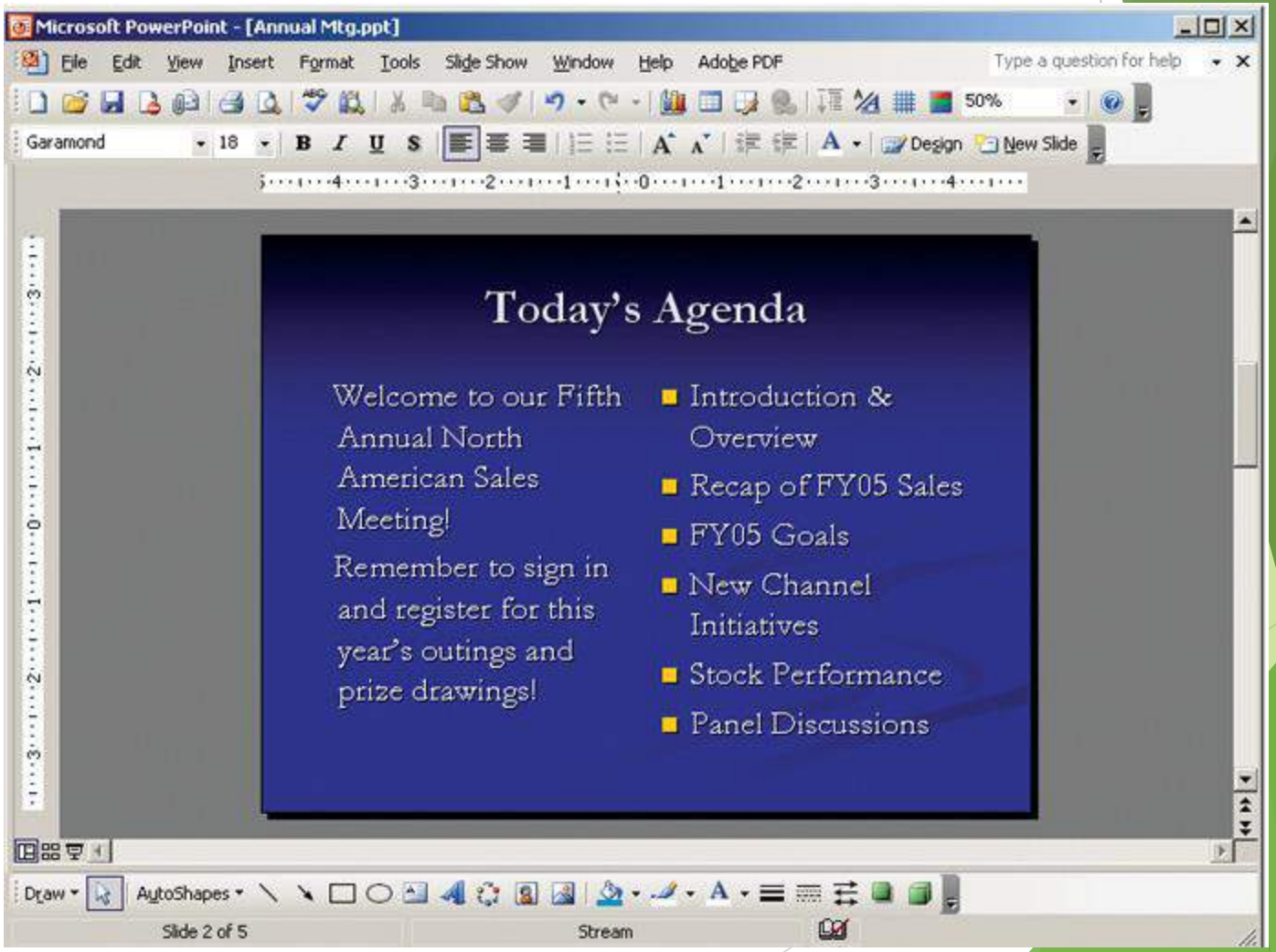
Production Line Errors: Men's Dress Shoes (March 2006)

	Outsole	Backstay	Ankle Patch	Eyelets	Liner	Upper	Piping	Label
Line 1								
AM Shift	48	92	98	44	64	18	21	44
PM Shift	49	89	87	40	61	21	22	42
Line 2								
AM Shift	42	86	94	42	62	20	24	41
PM Shift	45	89	97	43	66	21	25	43
Line 3								
AM Shift	51	89	89	39	60	22	20	40
PM Shift	52	91	91	39	63	24	21	45
Line 4								
AM Shift	39	87	89	88	59	20	23	39
PM Shift	41	88	90	91	50	24	22	45
Total:	**367**	**711**	**735**	**426**	**485**	**170**	**178**	**339**
Average:	**45.9**	**88.9**	**91.9**	**53.3**	**60.6**	**21.3**	**22.3**	**42.4**

Presentation Programs

- Interface
  - Similar to a word processor
  - Slide window
  - Outline window
  - Speaker notes

Presentation Interface



Presentation Programs

- Creating a presentation
  - Templates can simplify the process
  - Build the slides
    - Pick a layout
    - Enter the desired text
    - Apply special formatting
  - Continue adding slides in order
  - Apply slide transitions if desired

Presentation Programs

- Presenting slide shows
  - Use to enhance a speech
  - Mouse click advances to next slide
  - Physical transparencies on an overhead
  - Computer screen delivery
  - Large monitor delivery
  - Data projector

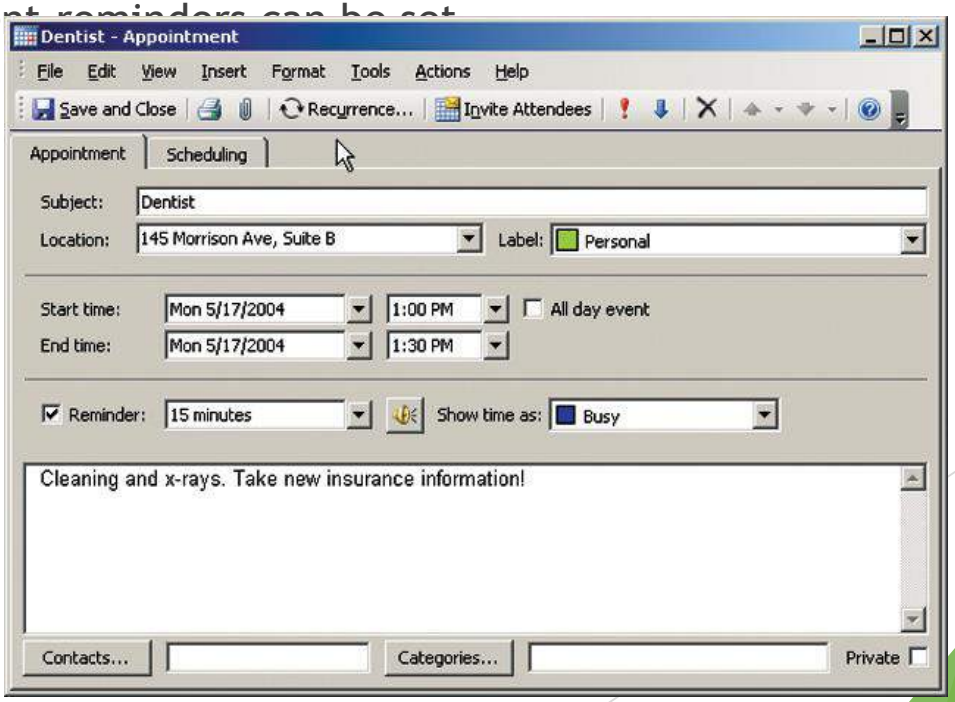
Using a Large Monitor

Personal Information Managers

- PIM software
- Keep track of contact information
- Track upcoming events and times
- MS Outlook is popular

Personal Information Managers

- Data organization
  - Contact information organized by last name
  - Users may search for data
  - Appointment reminders can be set



THANK YOU

UIA (UIDAI)

-Department of CS

UIDAI Unique Identification Authority of India

- Initiated by the Planning Commission to provide unique identification for each resident across the country, used as the basis for efficient delivery of welfare services.
- Authority will partner with agencies such as central and state departments and private sector agencies, who will be 'Registrars' for the UIDAI.
- Registrars will process Aadhaar applications, and connect to the Repository to de-duplicate resident information and receive Aadhaar.

UIDAI Unique Identification Authority of India

- The repository will perform a search on key demographic fields and on the biometrics for each new enrolment, to minimise/eliminate duplicates in the database.
- UIDAI will Design, develop, and deploy the Aadhaar application with the help of service providers and issue 12 digit AADHAAR number.

Information collected for UID

KYR Fields – Name, Address, Gender, DOB 

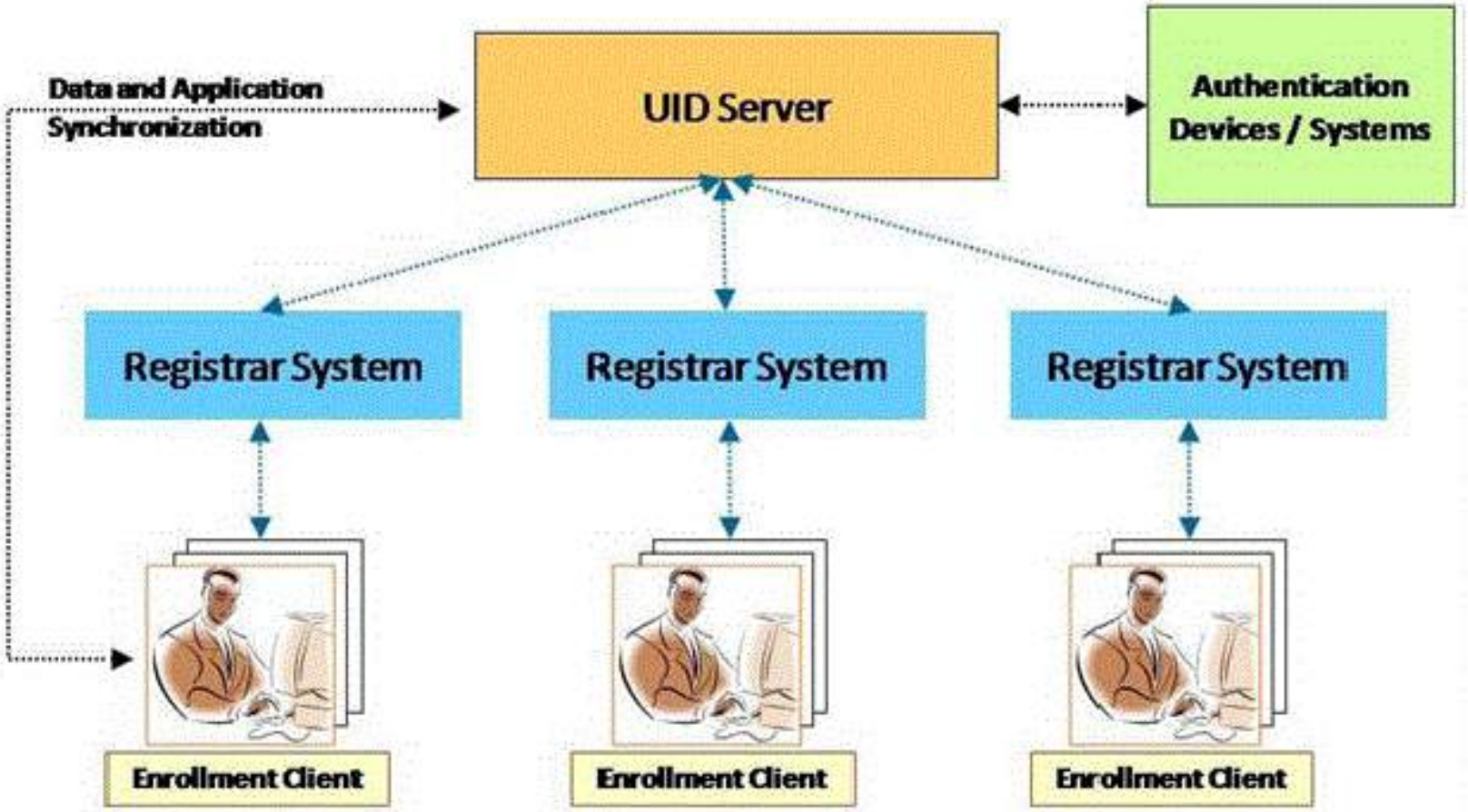
Name & Address Verification 

Photo 

10-fingerprints 

Iris image 

Application Architecture



Thank You