

TODAY'S LECTURE WITH BRIAN PATRICK

Chapter 5

System Software: Operating Systems and Utility Programs

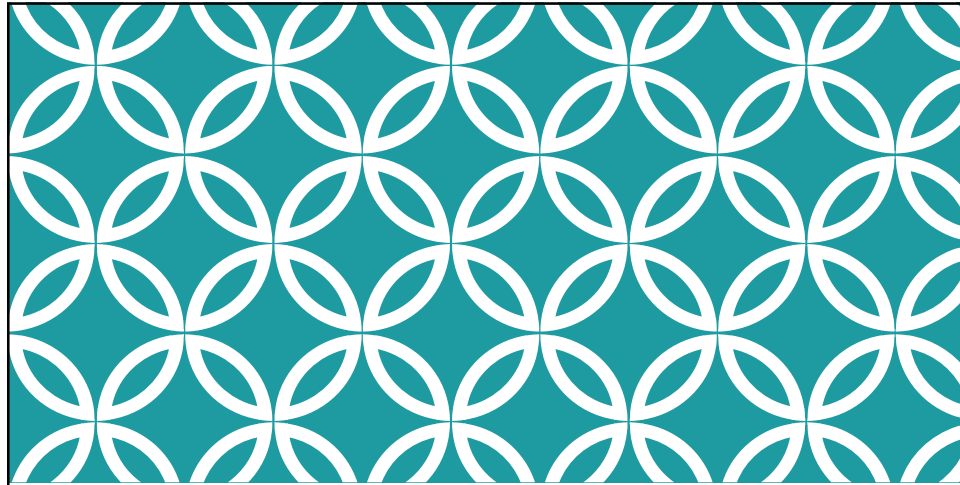
Chapter 6

Application Software: Desktop and Mobile Apps

AFTER TODAY'S LECTURE

Workshop with Jamie Mitchell





CHAPTER 5: SYSTEM SOFTWARE

WHAT IS AN OPERATING SYSTEM?



A LITTLE HISTORY



WHAT DOES AN O/S DO?

Interfaces

Boots

Configures devices

Manages networks

Manages and monitors **resources** and **jobs**

Manages files

Protects




MACINTOSH AD (1984)

A vintage Macintosh computer setup from 1984. The beige Macintosh Plus unit is shown with its screen displaying the classic Mac OS desktop. The screen shows a menu bar at the top with 'File Edit Window Help' and a menu icon. Below the menu bar is a window titled 'hello.' containing the word 'hello.' in a cursive script font. The desktop also features a vertical stack of icons on the left side. The Macintosh Plus has a floppy disk drive below the screen and a small rainbow-colored Apple logo on the front. A beige keyboard and a one-button mouse are connected to the front of the unit. The entire setup is on a white reflective surface.

INCREASING EFFICIENCY

- Multitasking
- Multithreading
- Multiprocessing
- Parallel processing
- Virtual memory

A sleek, white high-speed train with a dark blue stripe is shown from a low angle, moving towards the right. The train is on a track, and the background is a plain, light gray, suggesting a clean, modern environment. The train's design is aerodynamic, with a pointed nose and large windows.

Virtual memory



IBM “SUMMIT” (2018) AT OAK RIDGE NATIONAL LABORATORY



200 petaflops

= 200,000,000,000,000 floating point operations/second

3.3 exaops

= 3,300,000,000,000,000 mixed precision operations/second

10 petabytes

= 10,000,000,000,000 bytes of storage

27,648 GPUs + 202,752 CPU cores

CATEGORIES OF O/S

Personal/desktop operating systems

Server operating systems

Mobile operating systems

Embedded operating systems

Mainframe and supercomputer operating systems

WINDOWS 1.0 LIVING COMPUTER MUSEUM (SEATTLE)



WINDOWS 10

Universal operating system

Consistent look and feel

Experience is optimized for each device

Start menu

Resizable windows

Task Views to create personalized virtual desktops

Web browser called Edge

Virtual assistant called Cortana



LINUX

Developed by Linus Torvalds in 1991

Open source software

Free

Customizable interfaces

Lower hardware requirements

Ubuntu

Android



Tux

WHAT ARE UTILITY PROGRAMS?



File management (copying, moving, renaming, deleting files/folders)

Search tools

Diagnostic and disk management tools (disk defragmentation)

Uninstall and cleanup utilities

File compression programs

Backup and recovery utilities (to/from external drives and the cloud)

Security programs (antivirus, antispyware, firewalls)



CHAPTER 6: APPLICATION SOFTWARE

WHAT IS APPLICATION SOFTWARE?



OWNERSHIP RIGHTS

Commercial software

Shareware

Freeware

Public domain software



INSTALLED SOFTWARE

Purchased in physical form (DVD) or downloaded via an app store

Payment depends on the ownership rights

Crapware



CLOUD SOFTWARE

Software-as-a-Service
Utility model of payment



Advantages

- Files can be accessed from any computer with an Internet connection
- Improved collaboration capabilities
- Ease of implementation
- Lower cost of ownership
- Always working with the current version of software

Potential Disadvantages

- Online applications tend to run more slowly
- File size limitations
- Cost may eventually exceed the cost of purchasing
- No access if Internet access is interrupted or unavailable



SOFTWARE SUITES

A collection of software programs bundled together and sold as a single package



TYPES OF APPLICATIONS

Word processing

Spreadsheets

Databases (last week)

Presentation graphics

Publishing software

Note taking software

Graphics software

Audio and video editing

Computer-aided design

Project management

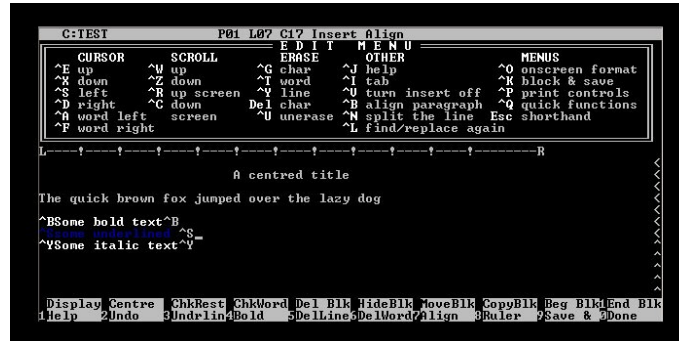
Accounting/personal finance

Media players

Etc.

WORD PROCESSING

To create, edit, format, save, and print written documents



WordStar (1979)



Rob Barnaby

SPREADSHEETS

A group of labels, values, and formulae organized into rows and columns

VisiCalc (1979)

	A	B	C	D
1	ITEM	NO.	UNIT	COST
2	MUCK RAKE	43	12.95	556.95
3	BUZZ CUT	15	6.70	101.00
4	TOE TONER	250	49.95	12487.50
5	EYE SNUFF	2	4.95	9.90
6			SUBTOTAL	13155.50
7			9.75% TAX	1282.66
8			TOTAL	14438.16



Dan Bricklin



Key concepts and capabilities

Absolute vs relative cell referencing (\$B\$5 vs B5)

Charts and graphs

What-if analysis (sensitivity analysis)



RELATIONAL DATABASES

EDGAR Codd, 1970

A collection of tables, each one a collection of records (rows) made up of fields (columns)

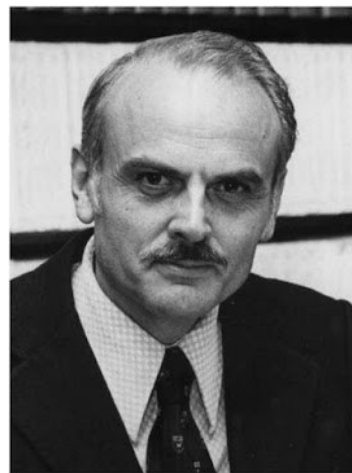
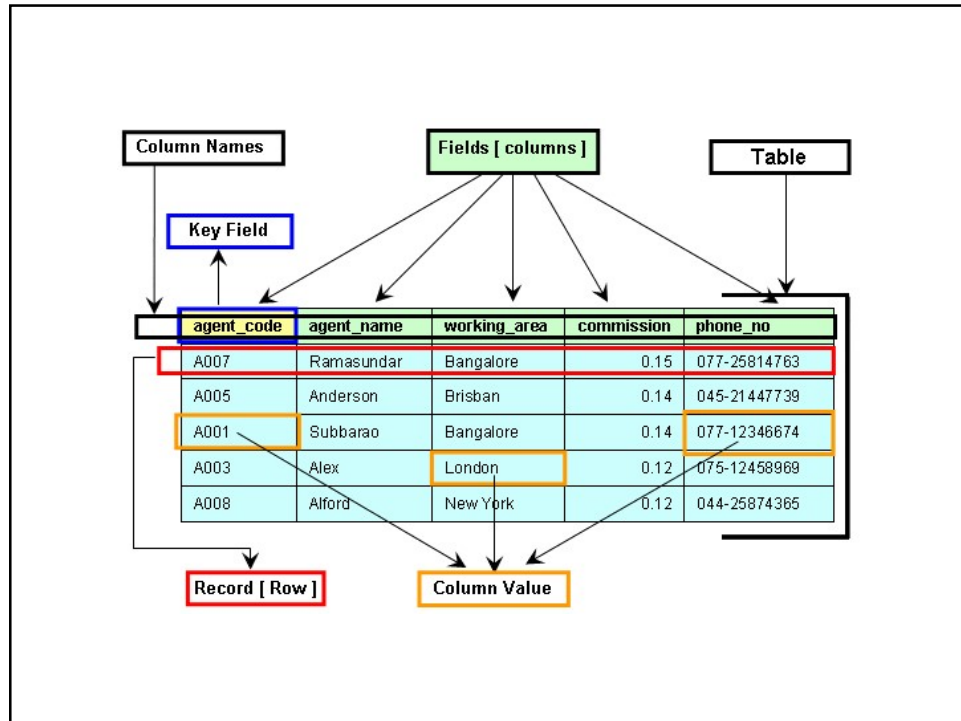
Key concepts and capabilities

The primary key is used to identify a record in a table

A foreign key is used to cross-reference tables

Normalization

Queries (e.g. SQL) and reports



Signature

PRESENTATION GRAPHICS

Electronic slide show ... like this one

Composed of

- Text
- Images
- Charts
- Audio clips
- Video clips

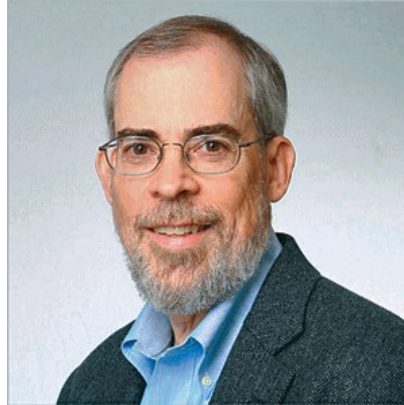
Key concepts and capabilities

Themes and layouts

Animation

Speaker tools

Robert Gaskins



GOOD LUCK WITH TEST 1

And see you after the break ...

But now ... stick around for Jamie