

# CHAPTER 4

## SYSTEM SOFTWARE

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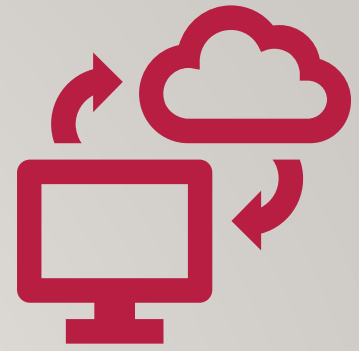
### Group member:

- LAI YEE JEN
- THAM CHUAN YEW
- MUHAMMAD ZAKI MUFTHI
- MUHAMMAD SABIQ AHSAN



# SYSTEM SOFTWARE

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- designed to run a computer's hardware and application programs
- runs independently and provides platform for running application software
- installed on the computer when operating system is installed

**Example:** operating systems, computational science software, game engines



**android**



**NWChem**

HIGH-PERFORMANCE COMPUTATIONAL  
CHEMISTRY SOFTWARE



**unity**

# APPLICATION SOFTWARE

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- designed for end users
- runs on the platform which is provided by system software
- tasks such as create text documents, play games, listen to music, or browse the web

**Example:** word processor, spreadsheet, and accounting application

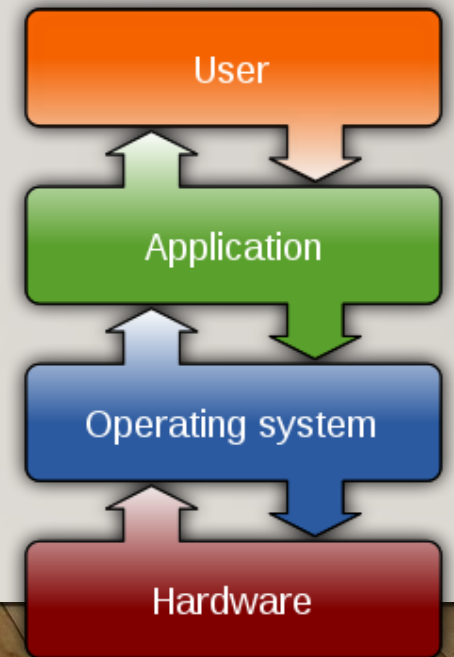




# OPERATING SYSTEM

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- manages computer hardware, software resources, and provides common services for computer programs
- the most important software on a computer
- **Example:** Microsoft Windows, MacOS, Linux, Android, iOS



# FUNCTION OF OPERATING SYSTEM

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**MEMORY  
MANAGEMENT**



**PROCESSOR  
MANAGEMENT**



**FILE MANAGEMENT**



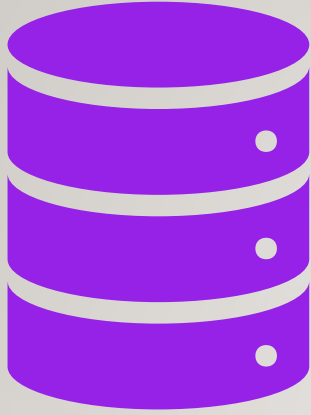
**DEVICE  
MANAGEMENT**



**BOOTING & APPLICATION  
MANAGEMENT**



**SECURITY  
MANAGEMENT**



# 1. MEMORY MANAGEMENT

- refers to management of main memory
- keeps tracks of main memory
- allocates the memory when a process requests it to do so

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## 2. PROCESSOR MANAGEMENT

- process scheduling
- keeps tracks of processor and status of process
- allocates the processor (CPU) to a process.







### 3. FILE MANAGEMENT

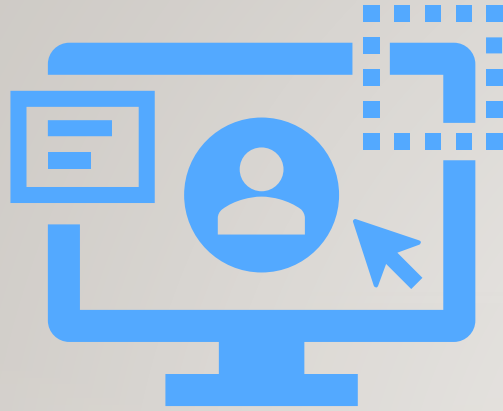
- keeps track of information, location, uses, status
- locate files easily
- creating, modifying and deleting the files

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### 4. DEVICE MANAGEMENT

- manages and maintains hardware devices of computer system
- printer, microphone, mouse
- allocates the device efficiently





## 5. BOOTING AND APPLICATION MANAGEMENT

- starts-up and restarts the computer
  - runs application and multitask
  - foreground and background applications
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## 6. SECURITY MANAGEMENT

- secure and protect the computer system
- internal and external security
- protects against unauthorized access, system threats, program threats



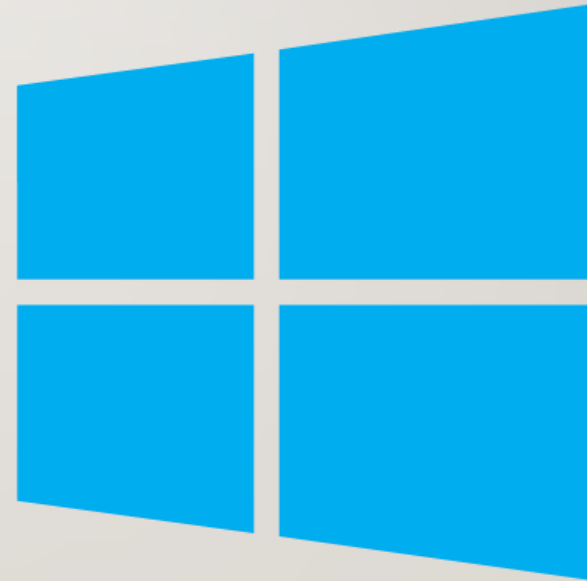
# TWO TYPES OF OPERATING SYSTEM

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## 1. MOBILE OS



## 2. DESKTOP OS



## 1. ANDROID OS



- developed by Google and Open Handset Alliance in 2008
  - designed for touchscreen mobile devices
  - free and open source
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## 2. iOS



- developed by Apple in 2007
- exclusive for Apple's hardware
- second-most widely installed OS





# WINDOWS

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- developed by Microsoft Corporation in 1985
- most-widely used desktop OS
- supports almost every application
- supports high-end gaming technology



Bill Gates



**DESKTOP OS**



Suggested



Microsoft Mahjong  
★★★★★

Free

A



Afterlight



Allrecipes

C



Calculator



Calendar



Camera

D



Dragon Mania Legends



Dropbox

E



Edmodo



Excel 2016

G

○

Welcome Daniela!  
How can I help you today?

Cortana

Mike Kong  
School Project  
Notes



Mail 20



Sunny  
68°F 88°  
67°  
Los Angeles



Store



Maps





Xbox



MINECRAFT  
HUNDREDS OF ADVENTURES





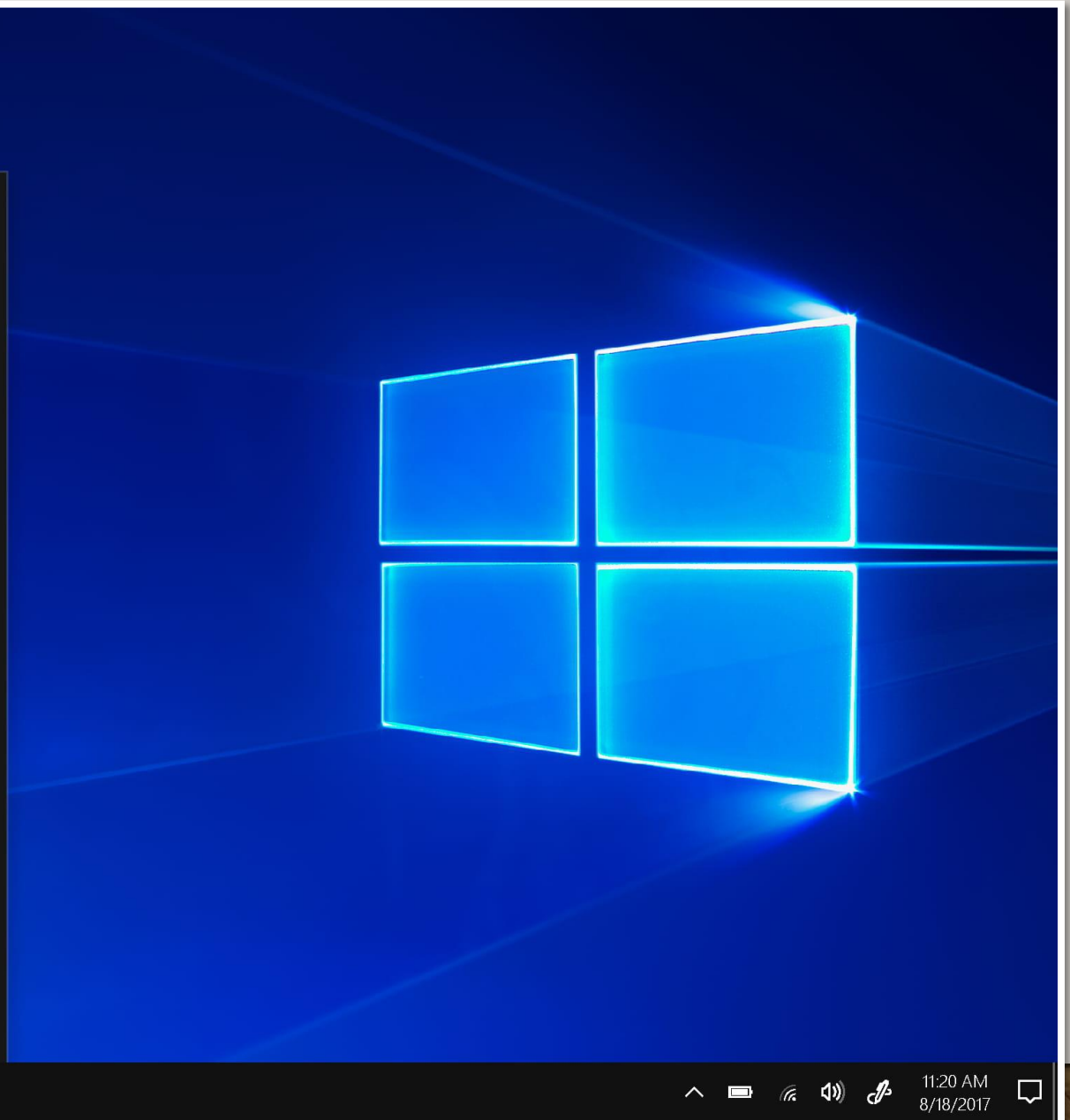


○ Ask me anything





11:20 AM  
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# MAC OS

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- developed by Apple in 2001
- second most-widely used OS
- high security system
- simple yet elegant interface and displays



Steve Jobs



**DESKTOP OS**

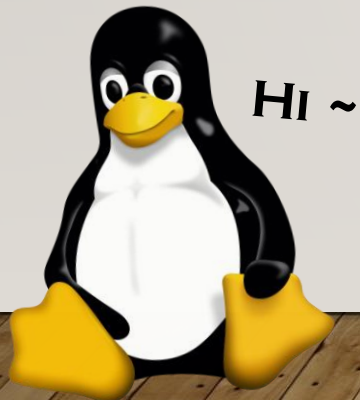




# LINUX

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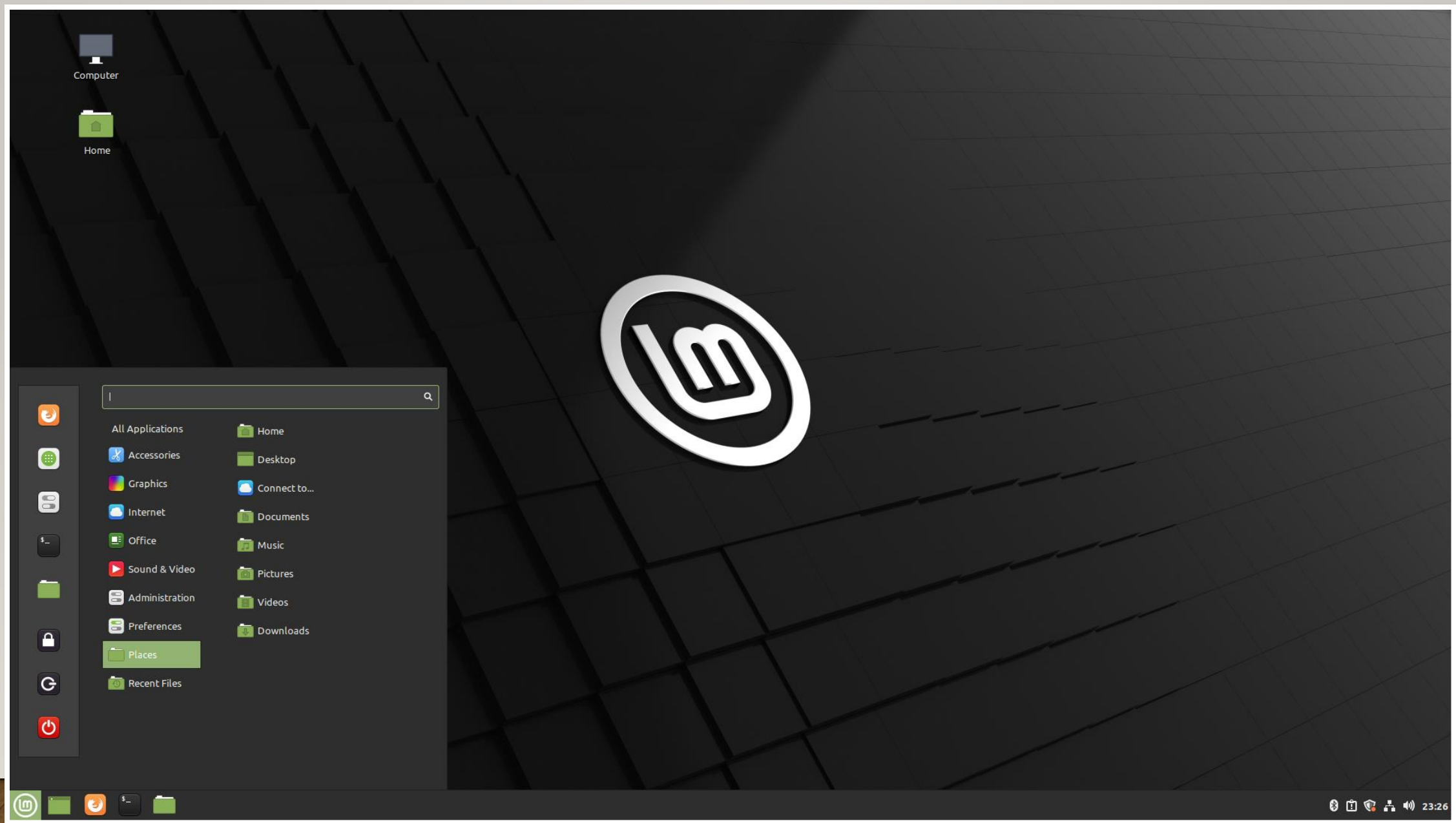
- developed by Linus Torvalds in 1991
- family of open-source Unix-like operating systems
- highly customizable
- fast and easy installation



Linus Torvalds

**DESKTOP OS**







# VIRTUALIZATION

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- Run multiple operating systems on a physical machine
- Virtual machine appears as an independent computer
- **Examples of virtualization software:**
  1. Parallels Desktop
  2. Oracle Virtualization
  3. Microsoft Hyper-V

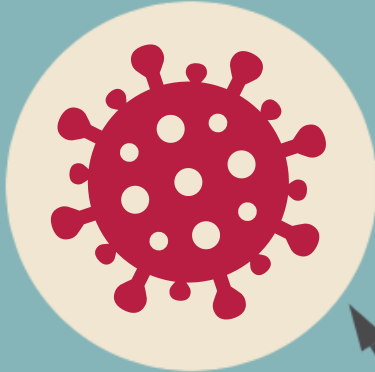
# UTILITIES

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- analyse, configure, optimize or maintain a computer
- specialized programs to make computing easier
- **Four main types of utilities:**
  1. System utilities
  2. Storage device management utilities
  3. File management utilities
  4. Miscellaneous utilities

# SYSTEM UTILITIES

Here are the examples  
of System Utilities:



**ANTIVIRUS**



**PACKAGE MANAGERS**



**CLIPBOARD MANAGERS**



**DIAGNOSTIC PROGRAMS**



# ANTIVIRUS

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- prevent, detect and remove malware
- surfing hacked sites, downloading infected files, opening malicious email attachments
- **Examples of malwares:**
  1. Adware
  2. Spyware
  3. Trojan
  4. Ransomware

# DIAGNOSTIC PROGRAMS

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- determines the operational status within the software, hardware in component
- troubleshoots the problems and provide guidance to user
- **Examples of programs:**
  1. Performance monitor
  2. Reliability monitor
  3. JScreenFix



# CLIPBOARD MANAGERS

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- adds functionality to an operating system's clipboard
- store data copied to the clipboard and permits extended use of the data
- **Examples of features:**
  1. Multiple buffers and the ability to merge, split, and edit their contents
  2. Selecting which buffer "cut" or "copy" operations should store data in
  3. Handling formatted text, tabular data, data objects, media content, and URLs

# PACKAGE MANAGER



- automates the process of installing, upgrading, configuring, and removing computer programs
- deals with packages which contain metadata such as software's name, version number and description of its purpose
- **Examples of functions:**
  1. Extract package archives
  2. Verify package's checksums and certificates
  3. Install or update existing software from app store

# STORAGE DEVICE MANAGEMENT UTILITIES

Here are the examples  
of Storage Device  
Management Utilities:



**BACKUP SOFTWARE**



**DATA COMPRESSION**



**DISK CHECKERS**



**DISK FORMATTERS**



# BACKUP SOFTWARE

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- programs that perform a backup
- create supplementary exact copies of files, databases or entire computers to be restored in the event of data loss
- **Example of features:**
  1. Data compression
  2. Schedules
  3. Encryption

# DISK CHECKERS

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- scan hard disk to find files that are corrupted in some way, or were not correctly saved
- eliminates them for a more efficient hard drive
- **Examples of disk checker tools:**
  1. CHKDSK
  2. fsck



# DISK FORMATTERS

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- prepare data storage devices such as a hard disk drive, solid-state drive, floppy disk or USB flash drive for initial use
- erase existing files on disk to free up storage
- **Processes of disk formatting:**
  1. Low-level formatting
  2. Partitioning
  3. High-level formatting

# DISK COMPRESSION

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- increases the amount of information that can be stored on a hard disk drive of given size
- compresses the information to be stored and decompresses it when it needs to be read
- **Examples of disk compression software:**
  1. Stacker
  2. XtraDrive
  3. DiskDoubler

# FILE MANGAEMENT UTILITIES

Here are the examples  
of File Management Utilities:



**DISK CLEANERS**



**FILE MANAGERS**



**DATA RECOVERY**



**FILE ARCHIVERS**



# DISK CLEANER



- find and delete potentially unnecessary or potentially unwanted files from a computer
- to free up disk space, eliminate clutter or to protect privacy

## Unnecessary Files

- Temporary files
- Trash
- Old backups
- Web caches

## Privacy Risks

- HTTP cookies
- Local shared objects
- Log files

# DATA RECOVERY

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- recover inaccessible, lost, damaged or formatted data from secondary storage
- recovery may be needed for physically-damaged storage devices or logically-damaged file system
- **Examples of data recovery software:**
  1. EaseUS Data Recovery
  2. Stellar Data Recovery
  3. Paragon Backup and Recovery



# FILE ARCHIVERS

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- combine a number of files together into one archive file
- ease transportation and storage due to reduced size of archive
- **Examples of file archivers:**
  1. WinRAR
  2. 7-zip
  3. Keka

# FILE MANAGERS

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- provides a user interface to manage files and folders
- allows users to view, edit, copy and delete files
- **Examples of file manager:**
  1. Total Commander
  2. Directory Opus
  3. Clover

# MISCELLANEOUS UTILITIES

Here are the examples of Miscellaneous Utilities:



**DATA GENERATORS**



**SCREENSAVERS**



**INSTALLATION**



**PATCHING**



# DATA GENERATORS

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- specialized software tool that generates false or mock data for use in testing software applications
- commonly used for testing databases and database management software (DBMS)
- **Examples of data generators:**
  1. DATPROF
  2. REDGATE SQL DATA GENERATOR
  3. INFORMatica TEST DATA MANAGEMENT

# INSTALLATION

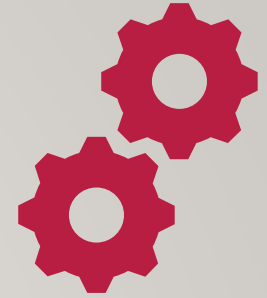
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- process of making hardware or software ready for use
- two broad categories
  1. Physical - hard drives, cables, modems
  2. Virtual - Windows Installer installation, web-based software installation and single exe software installation



# PATCHING



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- set of changes to a computer program or its supporting data designed to update, fix, or improve it
  - important for updating programs or new system security threats which appear regularly
  - patches vary in sizes from several kilobytes to hundreds of megabytes



# SCREENSAVERS

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- a computer program that blanks the screen or fills it with moving images or patterns when the computer has been idle for a long time
- originally used to prevent phosphor burn-in on CRT and plasma computer monitors
- mostly used for security, showing system information, entertainment and other functions now

# CAREERS IN IT

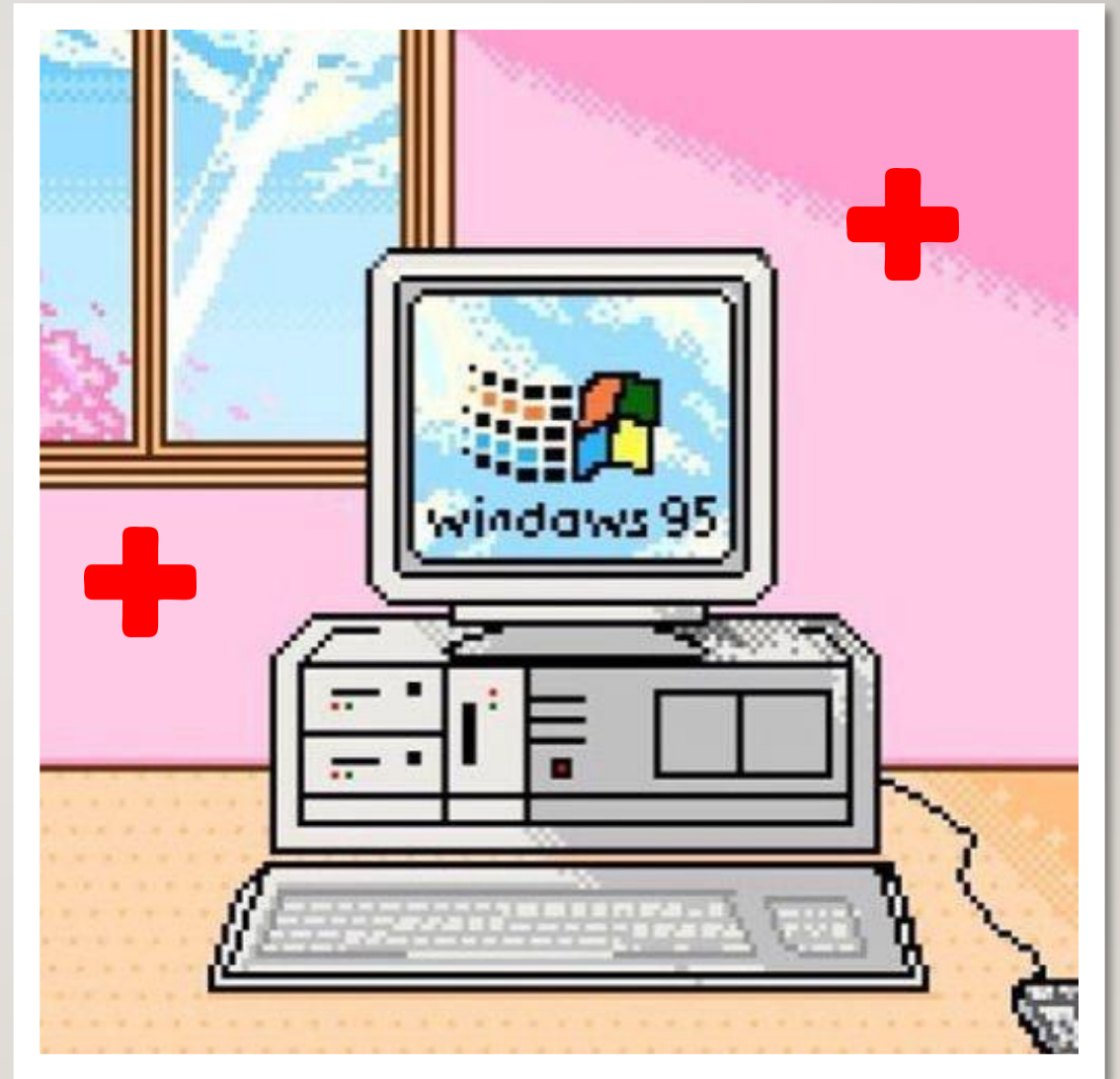


Career	Description	Average Salary (RM)
1. Software Engineer	Design, test, and develop the computer software	49,325
2. Security Analyst	Monitor and analyze security access and breaches	47,484
3. System Analyst	Conduct application testing and provide database management support	59,704
4. Video Game Designer	Conceptualize and implement game mechanics, animation, characters, narrative, assets, AI behaviors, text, and sound	46,620
5. Data Scientist	Mine and analyze data from company databases to drive optimization and improvement of product development, marketing techniques and business strategies	60,012

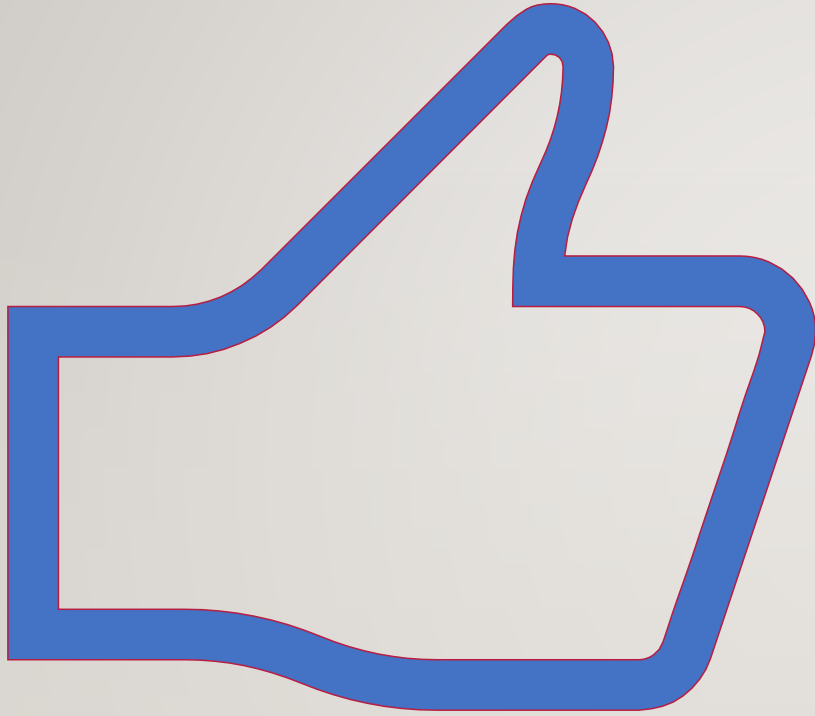
# A LOOK TO THE FUTURE

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- Self-healing computer
- Faster and more compact computer
- Self-maintaining servers







**THANKS FOR  
LISTENING**

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