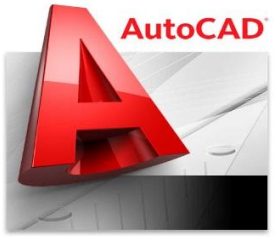
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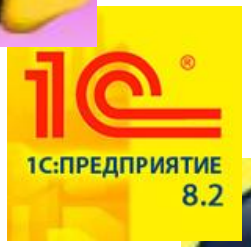
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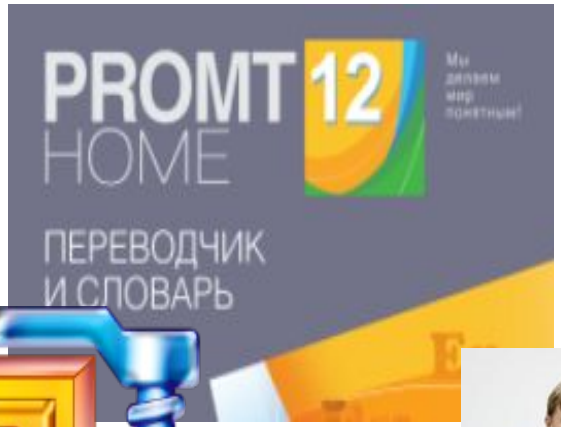
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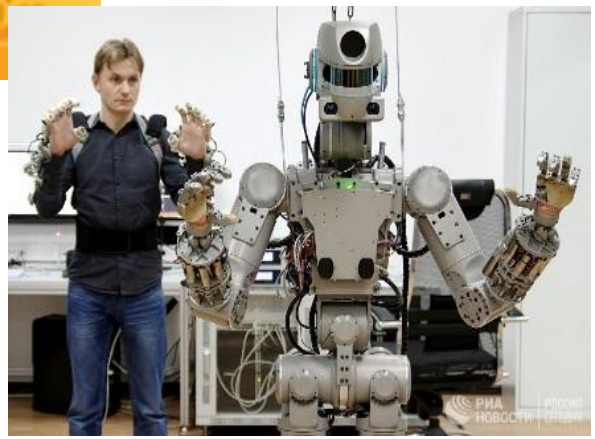


Types of Software (Application, System)

Lesson Objectives

- summarise the selection of generic application software for a range of tasks e.g. word processor, spreadsheet, desktop publisher (DTP), presentation software, graphics packages (bit mapped and vector graphics), and justify the choices
- assess the advantages and disadvantages of a range of generic application software

Software Types

Application software

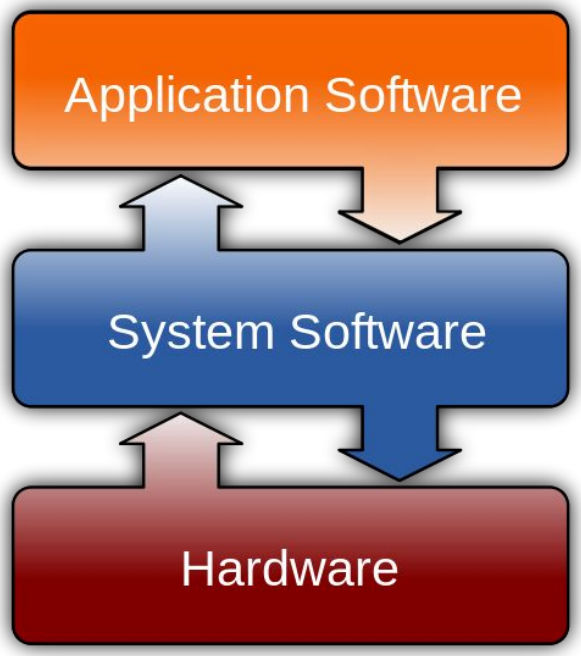
System software

General Purpose software

Special Purpose software

Bespoke software

System software



A set of programs designed to control and manage the operations of the computer hardware.

The software allows application programs to execute properly

There are several different types of system software – You need to recall this information in the exam

Operating System - make the computer hardware conveniently available to the user and also hide the complexities of the computer's operation

Library programs are a compiled collection of subroutines

Translator software
Assembler
Compiler
Interpreter

Utility programs that include file management, copy, paste, delete, file searching, disk defragmenter, disk cleanup.

System software

Application software

general purpose software

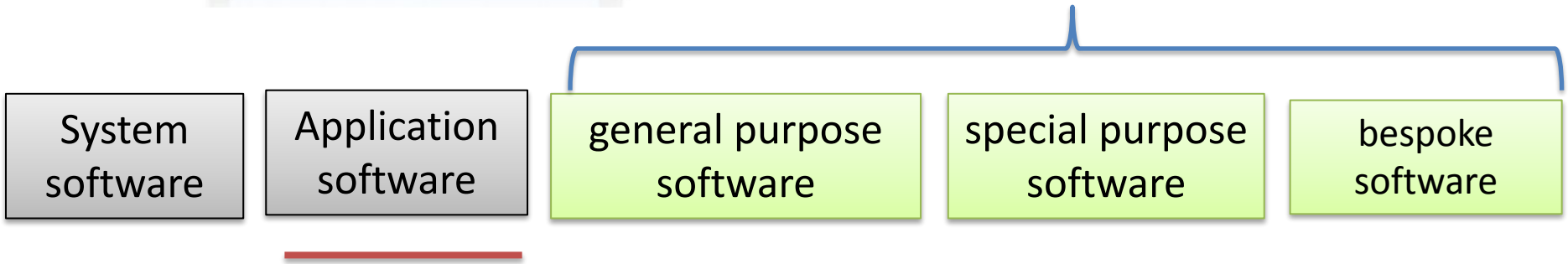
special purpose software

bespoke software

Application software

- Includes programs that do real work for the user. They are created to perform specific tasks for a user.

categories of Application software



General Purpose software

Word processing
Presentation
Desktop publishing
Spreadsheet
Database Management
Graphics
Communication
Computer Aided Design
Games

This software is also called off the shelf. You can buy it at a shop or download it on line.

The software is written for a wide audience and not all of the features are used. The software is relatively cheap and usually well tested.

When giving examples
NEVER use brand and company names

Microsoft Word ☐

Word processing ☐

System software | Application software | general purpose software | special purpose software | bespoke software

Special Purpose software

- Special purpose application software is a type of software created to execute one specific task. For example

Movie editor, sound editor, photo editor, web page design and development.

Tax calculating system for accountants

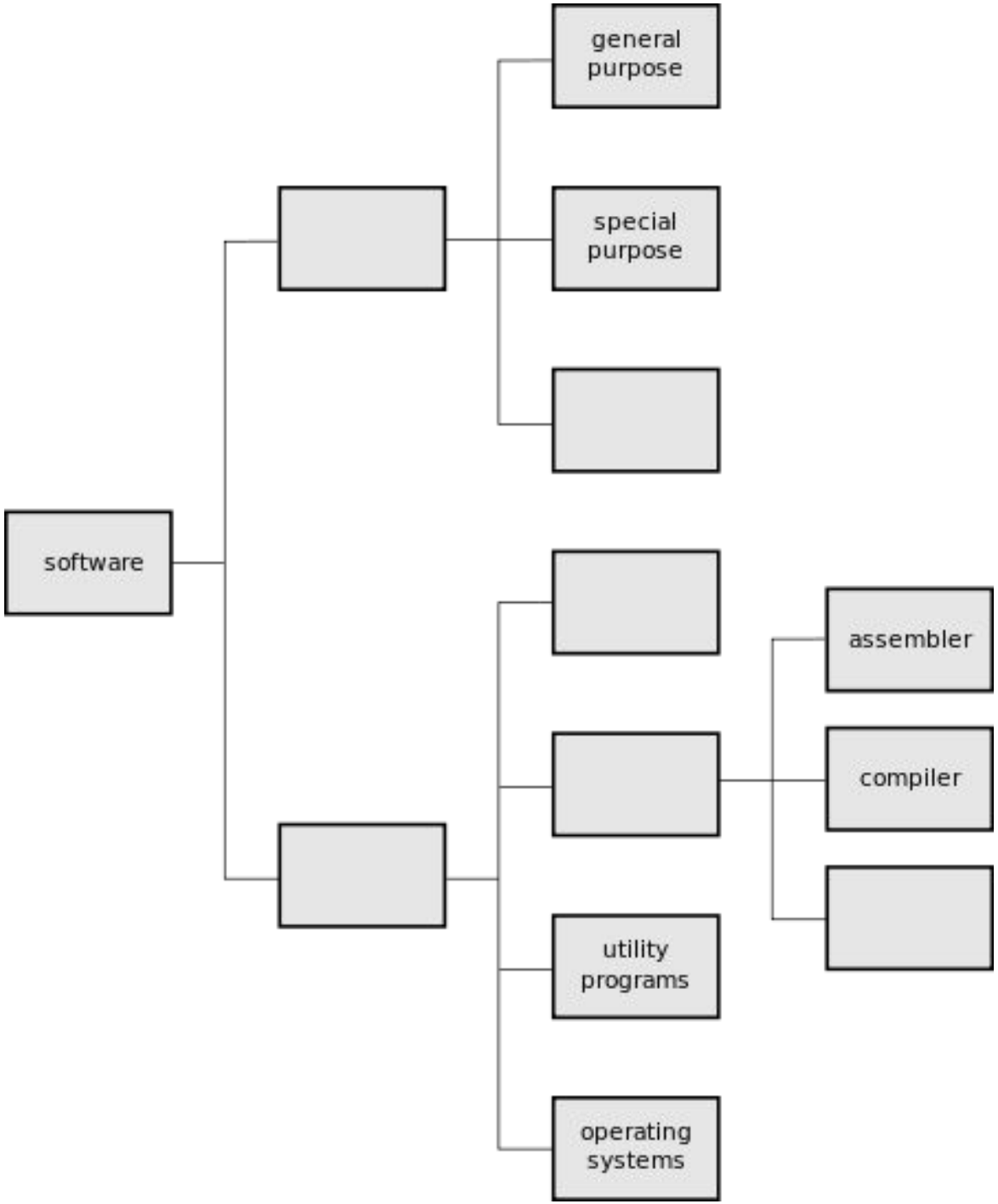
Computer aided design for graphic designers or architects

Bespoke software

- Bespoke application software is tailor made for a specific user and purpose. For example a factory may require software to run a robot to make cars, however, it is the only factory making that car in the world, so the software required would have to be specially built for the task.

Advantage	Disadvantages
Software is built for and will meet your precise needs	Software will be expensive as you have to cover all of the production costs
	It may take some time to develop the software
	The software is more likely to be buggy as it probably won't have thousands of clients using and testing it

System software | Application software | general purpose software | special purpose software | bespoke software



EXAM STYLE QUESTION.

Fill in the gaps with the correct terms

Library programs

translators

Application software

bespoke

interpreter

What software is the most important?

Why?

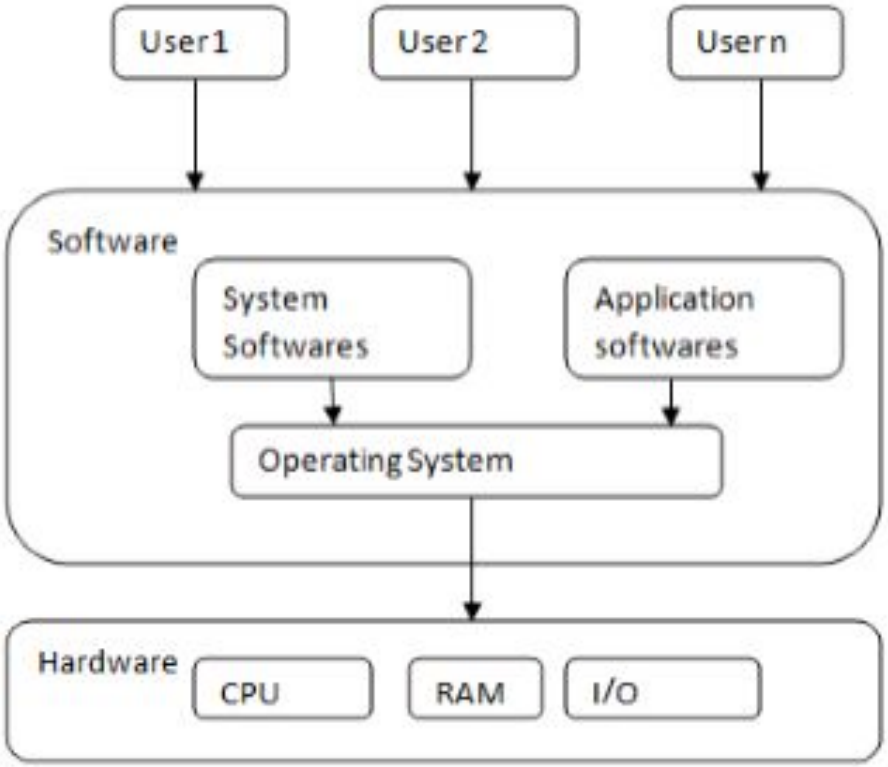
Operating Systems

Lesson Objectives

describe the purpose and main functions of operating systems

When you turn on your computer, it's nice to think that you're in control. There's the trusty computer mouse, which you can move anywhere on the screen, summoning up your music library or Internet browser at the slightest whim. Although it's easy to feel like a director in front of your desktop or laptop, there's a lot going on inside, and the real man behind the curtain handling the necessary tasks is the operating system.

An OS is a program that controls the execution of application programs and acts as an interface between applications and the computer hardware.



Most desktop or laptop PCs come pre-loaded with Microsoft Windows. Macintosh computers come pre-loaded with Mac OS X. Many corporate servers use the Linux or UNIX operating systems. The operating system (OS) is the first thing loaded onto the computer -- without the operating system, a computer is useless.

Windows 7

More recently, operating systems have started to pop up in smaller computers as well. If you like to tinker with electronic devices, you're probably pleased that operating systems can now be found on many of the devices we use every day, from cell phones to wireless access points.

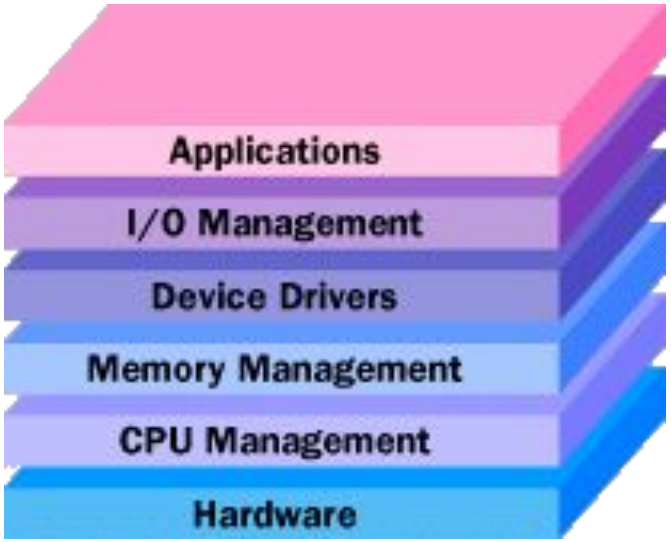
The purpose of an operating system is to organize and control hardware and software so that the device it lives in behaves in a flexible but predictable way.

Not all computers have operating systems. The computer that controls the microwave oven in your kitchen, for example, doesn't need an operating system. It has one set of tasks to perform, very straightforward input to expect (a numbered keypad and a few pre-set buttons) and simple, never-changing hardware to control. For a computer like this, an operating system would be unnecessary baggage, driving up the development and manufacturing costs significantly and adding complexity where none is required. Instead, the computer in a microwave oven simply runs a single hard-wired program all the time.

For other devices, an operating system creates the ability to:

- serve a variety of purposes
- interact with users in more complicated ways
- keep up with needs that change over time

In any device that has an operating system, there's usually a way to make changes to how the device works. This is far from a happy accident; one of the reasons operating systems are made out of portable code rather than permanent physical circuits is so that they can be changed or modified without having to scrap the whole device.



At the simplest level, an operating system does two things:

1. It manages the hardware and software resources of the system. In a desktop computer, these resources include such things as the processor, memory, disk space and more (On a cell phone, they include the keypad, the screen, the address book, the phone dialer, the battery and the network connection).
2. It provides a stable, consistent way for applications to deal with the hardware without having to know all the details of the hardware.

The operating system's tasks, in the most general sense, fall into six categories:

1) Processor management
2) Memory management
3) Device management
4) Storage management
5) Application interface
6) User interface

1. Processor Management

The heart of managing the processor comes down to two related issues:

- Ensuring that each process and application receives enough of the processor's time to function properly
- Using as many processor cycles as possible for real work

The basic unit of software that the operating system deals with in scheduling the work done by the processoris either a **process** or a **thread**, depending on the operating system.

In order to give the appearance of lots of things happening at the same time, the operating system has to switch between different processes thousands of times a second. Here's how it happens:

- A process occupies a certain amount of RAM. It also makes use of registers, stacks and queues within the CPU and operating-system memory space.
- When two processes are multi-tasking, the operating system allots a certain number of CPU execution cycles to one program.
- After that number of cycles, the operating system makes copies of all the registers, stacks and queues used by the processes, and notes the point at which the process paused in its execution.
- It then loads all the registers, stacks and queues used by the second process and allows it a certain number of CPU cycles.
- When those are complete, it makes copies of all the registers, stacks and queues used by the second program, and loads the first program.

2. Process Control Block

All of the information needed to keep track of a process when switching is kept in a data package called a process control block. The process control block typically contains:

- An ID number that identifies the process
- Pointers to the locations in the program and its data where processing last occurred
- Register contents
- States of various flags and switches
- Pointers to the upper and lower bounds of the memory required for the process
- A list of files opened by the process
- The priority of the process
- The status of all I/O devices needed by the process

3. Memory Storage and Management

When an operating system manages the computer's memory, there are two broad tasks to be accomplished:

1. Each process must have enough memory in which to execute, and it can neither run into the memory space of another process nor be run into by another process.
2. The different types of memory in the system must be used properly so that each process can run most effectively.

The first task requires the operating system to set up memory boundaries for types of software and for individual applications.

4. Device management

The path between the operating system and virtually all hardware not on the computer's motherboard goes through a special program called a driver. Much of a driver's function is to be the translator between the electrical signals of the hardware subsystems and the high-level programming languages of the operating system and application programs. Drivers take data that the operating system has defined as a file and translate them into streams of bits placed in specific locations on storage devices, or a series of laser pulses in a printer.

5. Application Program Interfaces

Just as drivers provide a way for applications to make use of hardware subsystems without having to know every detail of the hardware's operation, **application program interfaces** (APIs) let application programmers use functions of the computer and operating system without having to directly keep track of all the details in the CPU's operation. Let's look at the example of creating a hard disk file for holding data to see why this can be important.

6. User Interface

Just as the API provides a consistent way for applications to use the resources of the computer system, a **user interface** (UI) brings structure to the interaction between a user and the computer. In the last decade, almost all development in user interfaces has been in the area of the **graphical user interface** (GUI), with two models, Apple's Macintosh and Microsoft's Windows, receiving most of the attention and gaining most of the market share. The popular open-source Linux operating system also supports a graphical user interface.

What happens if the operating system does not have one of the 6 functions?

1) Processor management
2) Memory management
3) Device management
4) Storage management
5) Application interface
6) User interface