

Chapter 1 to 3 :

GUI vs CLI :

Benefits

Max **three** from:

- Easier to use as no need to type commands
- No need to memorise/learn commands
- Can exchange data between different applications
- Better help facilities

Drawbacks

Max **three** from:

- Takes up more RAM/hard disk space/memory
- Can be slower for experienced programmers to use.
- Can be slower to run as graphics have to be loaded/larger program
- Restrictive can only use pre-defined functions
- Not in direct contact with OS/computer

Commands have to be learnt

Commands have to be typed in which takes time

The operator has to have specialist knowledge of the system

Help facilities are basic

Commands have to be precise

Advantages of SSD compared to HDD

- The SSD is lighter in weight than the HDD therefore the laptop will be lighter and more portable

- The speed of access in SSD is a lot quicker

- The speed of data transfer in SSD is a lot quicker

- There is less chance of the data becoming corrupted as it can save whilst the laptop is moving

- It is a smaller device therefore the laptop will be smaller/thinner

- SSD uses less energy

- Less chance of impact damage

Describe three advantages of using a desktop computer rather than a laptop computer.

- As the elements are separate units there is more choice of devices/can be replaced if fails

- Can be easier to upgrade

- Easier to reduce glare on screen as it is separate

- Laptop more expensive for same performance

- Lower chance of it being stolen/lost

Identify the methods he would use to transfer the photographs to the computer.

Digital camera photograph – use a USB connection/insert the memory card/use a memory card reader/download the photograph from the cloud/use bluetooth connection/use wifi connection/connect a cable

Printed photograph – scan the image/use a scanner/photograph the image using a digital camera

Contactless debit cards are replacing standard debit cards. Some countries are introducing contactless debit card transactions at ATM machines. Give three disadvantages to the customer of using these cards at an ATM

The card may be read accidentally
Only small amounts can be withdrawn
More chance of fraud if card is stolen/lost
May not be able to use the ATM as not everyone will be contactless due to cost
Devices can read the cards wirelessly to steal money

Give three methods of reading the data from the credit card.

Magnetic stripe reader
Chip reader
Contactless reader/RFID reader/NFC reader
Using a manual/physical imprint card reader

OMR – Optical mark reader/recognition

Example – Lottery tickets/multiple choice answers/reads marks on papers

MICR – Magnetic ink character reader/recognition

Example – Cheques/reads the data from the bottom of bank cheques

A student has completed some work at school and wishes to take it home. He could use a pen drive or a CD R disc to transport the files. 6 (a) Give two error messages that could appear to stop him saving his work.

Scan the pen drive for errors
Medium is full
Virus found on the file
Bad sector/unable to save
Device not recognised
Read error

OMR Drawbacks

If the marks don't fill the space completely they may not be read correctly/overflow the space/smudged
If the marks are not in a dark enough pencil they may not be read correctly
If more than one lozenge shaded in result is invalidated
Only suitable for recording one out of a selection of answers, not suitable for text input
Have to use prepared forms which may be expensive
Examinations could consist of mainly multiple-choice questions changing the nature of what is being tested

Compare and contrast the use of a pen drive rather than a CD R.

Max **three** from:

- Not every computer has a CD drive, but most PCs have a USB port
- A CDR can slip between papers and can be easily lost
- Pen drive are small and can easily slip out of a pocket
- Pen drive stores more data
- Pen drive is more robust
- Pen drive can be overwritten/edited/data erased
- Pen drive is solid state whereas CDR is optical

Similarities

- Pen drive and CDR are storage devices
- CDR and pen drive are portable

Describe the differences between ROM and RAM.

ROM can only be read from whereas RAM can be read and written to

ROM is non-volatile whereas RAM is volatile

ROM stores the start-up instructions / boot file whereas RAM stores the current instruction

ROM is needed on boot up, whereas RAM is needed during processing / storing data

Compare and contrast CLI and GUI.

Post GUI allows the use of pinching, scrolling, expanding

Post GUI allows the use of touch screen but a CLI does not allow for this

Icons speed up finding instructions, CLI you have to type out the commands in full

No editing in CLI

If a mistake is made in CLI it could have major consequences whereas GUI has less impact

Due to graphics GUI uses a lot of memory, CLI is a lot smaller program

Loss of memory slows down the operations of the computer

GUI cannot operate properly if memory is low

The loss of memory affects kinds of applications that can be run

GUI more user friendly CLI the commands have to be memorised

GUI has a more varied use on other devices not just computers

In a CLI several commands have to be typed in rather than one command in GUI

CLI commands have to be typed in every time the same command is run

GUI sometimes have CLI embedded within them

CLI and GUI both carry out file management CLI and GUI use similar utilities

Both are operating systems

Both control the hardware and software

Uses of 3-D printing :

Create prosthetics

Create dental implants

Create customised tablets

Create skeletal model

Create blood vessels

Create anatomical models for surgery

Uses of holograms :

- Create MRI scan images
- Create ultrasound images
- Create 3D views of our internal organs

Describe the benefits and drawbacks of using an SSD rather than the cloud to store her data.

Benefits

- SSD is stored within the computer therefore Ananya has control over her data/in cloud the control may be lost
- SSD is a physical storage device in the laptop therefore is present at all times/the cloud is external to the laptop
- Once SSD is purchased there are no more costs/the cloud may have costs for extra storage
- There needs to be internet access when saving to the cloud/SSD does not necessarily need internet
- Transferring data to the SSD may take less time than cloud/low bandwidth
- May be more difficult to find data on the cloud than with SSD
- Easier to hack the cloud as the data is stored for a long period of time on many servers/less easy to hack SSD as only security on the laptop

Drawbacks

- With the cloud data can be accessed on several devices/SSD would have to have some method of transferring it.
- Extra storage can be set automatically on the cloud/SSD is a fixed size
- SSD Device can easily be misplaced/damaged
- Backups are automatic on the cloud/SSD you may have to set up

3D printers are being used for producing personalised prescription drugs

Advantages :

- Tablets can be customised to individual needs
- Easier to change the percentages of drug in the tablet
- Mass produced or small batches therefore reducing waste
- Created as needed therefore reducing waste
- Patient gets the drugs quicker

Disadvantages :

- Cost of buying the printer is expensive
- Materials are expensive
- Can be used for illegal production of drugs
- There are not many 3D printers created to date to do this

“Chip and PIN is the new, more secure way to pay with credit or debit cards”. Discuss the accuracy of this statement with regard to developments, since and including the use of magnetic stripe cards at EFTPOS terminals and ATMs.

Examples of more secure:

Data more difficult to copy

Larger amount of information can be stored

Disabled people find it easier than signing

Reduces disputes at checkouts over validity of signature/Saves time at checkouts

Not affected by magnetic fields

Even when the card is stolen, the thief still needs the PIN, so it is much safer

Magnetic stripe reader had to be in a fixed location.

If the transaction did not take place near a terminal (in a restaurant, for example) the card had to be taken away from the customer to the card machine.

It was easily possible for a dishonest employee to swipe the card surreptitiously through a cheap machine...

...which would take a couple of seconds to record the information on the card and stripe

Even at the terminal, the criminal could bend down in front of the customer and swipe the card on a hidden reader.

Illegal cloning of cards easy, and a common occurrence.

only the magnetic stripe can be copied, and a copied card cannot be used on a PIN terminal

The introduction of chip and PIN coincided with wireless data communications technology becoming inexpensive and widespread

Wireless PIN pads were introduced that could be brought to the customer and used without the card ever being out of sight

However, this would have been possible, had the technology been available, with magnetic stripe cards

Chip and PIN and wireless together reduce the risk of cloning of cards by brief swiping.

Examples of not always secure because:

Cards can still be cloned

People can be careless when using their PIN.

Credit and debit card fraud has gone down with chip and pin

ATM fraud has gone up.

Hidden cameras sometimes are used to see which keys are pressed for the PIN.

The advent of chip and pin has also generated a rise in phishing

Cars have to be designed before they can be manufactured. 3D printers can be used to produce models of a car. Describe the process involved in producing the models.

3D digital copy is made and put in the software.

Software slices the model into hundreds of layers.

Printer creates the model layer by layer.

Binds them together

Two from:

Software is programs/set of instructions.

Software controls/runs a computer system/hardware.

(i) System(s) (software)

(ii) For example: Operating system, file management system, utilities

iii) Application(s) (software)

iv) For example: Word processor, spreadsheet, database

Give two uses for virtual reality in everyday life.

Virtual museums

Virtual theme parks

Design of sports clothing

Flight simulation

Battlefield/combat simulation

Virtual tours

Medical training

Walkthroughs

Driving simulation

Name two devices that could be used with a virtual reality system.

Wand or joystick

Treadmill

Pressure mats

Data gloves

Headset/head mounted displays/Head mounted device(HMD)

Goggles

Steering/gaming wheels/consoles

Pedals

Paddles

Cameras

Motion sensors

Describe how Optical Mark Recognition is used to process the details from the form.

Dedicated scanner device shines a beam of light onto the form

Light is reflected back to sensors

Marks reflect less light so sensors used to identify position of marks

Computer compares these with correct answer positions

Describe how MICR is used to read these details from the cheque.

Requires a special Magnetic Ink Character reader/scanner/Details are scanned
The magnetic ink on the cheque passes over a magnet in the reader/scanner which
charges/magnetises the ink
The MICR reader/scanner then reads the magnetic signal given out by the magnetic ink
characters on the cheque.
Each character produces a unique signal which is read and translated by the MIC reader

Explain why magnetic ink is used rather than bar codes on a cheque.

More difficult to forge
Even if overwritten/damaged can still be read by computer
Information is human readable

Compare and contrast the use of magnetic tapes with removable magnetic disks to make network server backups.

both can be stored well away from the server...
...in the event of fire they will be secure
tapes are cheaper per bit
tapes are more compact than a portable hard disk for the same memory
it is quicker to access lost work using disks
disks would make it quicker to restore the system
tapes are less prone to data loss and mechanical failure
both can store very large amounts of data
both have very fast data transfer rates

Describe what an RFID chip consists of.

an integrated circuit...
...which contains an aerial...
...which receives and transmits data

ROM cannot be changed
RAM can be read from and written to
ROM is read only memory and RAM is random access memory
ROM holds instructions that need to be unchanged, such as BIOS/program cycles in a
washing machine/program instructions in games
RAM holds the work that is currently being done by the user [4]

MICR –
Magnetic Ink Character Recognition/Reader [1]
Used for processing bank cheques/Reads the characters at the bottom of bank cheques [1]

OMR –
Optical Mark Recognition/Reader/position of pencil/pen marks are read by scanner/Reader [1]
Used for processing exam papers/school registers/lottery/multiple choice questionnaires/positions
of marks identified on exam papers/school registers/lottery/multiple choice questionnaires [1]

Computer hardware is the collection of physical components that make up a computer system/physical parts of a computer that can be touched [1]

Examples of hardware are the monitor, mouse, keyboard, computer data storage, hard disk drive, graphic cards, sound cards, memory, motherboard, CPU [1]

Computer software is made up of the instructions that can be stored and run by hardware/ any set of machine-readable instructions/software directs a computer's processor to perform specific operations/programs that control the computer system [1]

Examples of software are spreadsheet software, data handling software, word processing software, DTP software, presentation software, control software, measuring software, operating system, anti-virus software [1]

Compare and contrast the use of optical discs and the use of fixed magnetic disks to store data

Optical discs such as CDs DVDs and Blu-ray discs...

...are read from and written to using a laser beam

Magnetic disks are read from and written to using read/write heads

Optical discs are more portable

Magnetic disks are more likely to spike

Optical discs are cheaper to buy

Magnetic disks store more data

Optical discs have slower access times

Optical discs have slower transfer rates

Optical discs can be more easily lost/stolen

Optical discs can be more easily scratched

Both store videos, music

Both use direct access

Give three reasons why files are backed up.

In case original data is accidentally deleted

In case data is maliciously deleted

In case original data is corrupted

To recover a previous version of a file

Discuss the advantages and disadvantages to a teacher of using a tablet computer instead of another type of computer.

Advantages

- More portable than PC/laptop
- Can access internet in most places if they are part of a phone plan unlike PC/laptop
- Larger screen area than smartphones
- Carry resources round with them

Disadvantages

- Smaller screen area than laptop/PC
- Touch screen so keyboard can be more difficult to use compared to laptop/PC
- Not as portable as smartphone
- Cannot access internet in as many places if they are not part of a phone plan
- More difficult to produce complex worksheets than PC/laptop

Backing up of data is done :

Copy onto removable storage medium

At regular intervals

Store the medium away from the computer

Make incremental backups

Contactless card readers :

Contactless systems reduce the time taken by retailers to deal with each customer

Customers don't need to queue for so long as contactless cards speed up the transactions/ quicker than inserting the card and entering the PIN

Only checks whether the card is not cancelled or stolen not always making a full check on what the balance of the holder's account is.

Customers are limited in what they can buy as transactions must be below a certain value

In some cases, the customer can unwittingly pay for another customer's purchase if they get too close to the terminal.

A thief armed with a suitable reader, within a few feet of the customer, would be able to interrogate all of the cards in their wallet without their knowledge.

If customer lost card a thief could make purchases without having to know a PIN

Customer can pay twice as terminal may detect the card for contactless payment but has inserted the card to use the PIN.

Customer doesn't have to worry about PIN being overseen/shoulder surfed

[6]