


National University of Computer and Emerging Sciences, Lahore Campus

	Course Name:	Human Computer Interaction	Course Code:	CS 422
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Student : Name:_____ **Roll No.**_____

Section:_____

Instruction/Notes: Solve on question paper, no rough sheets!

Question1. What input and output devices would you use for the following systems? For each, compare and contrast alternatives, and if appropriate indicate why the conventional keyboard, mouse and CRT screen may be less suitable. **(3 x 4 Points)**

(a) Portable word processor for blind and normal users.

Input Device1:

Portable word processor

The determining factors are size, weight and battery power. However, remember the purpose: this is a word processor not an address book or even a data entry device.

- (i) LCD screen – low-power requirement
- (ii) trackball or stylus for pointing
- (iii) real keyboard – you can't word process without a reasonable keyboard and stylus handwriting recognition is not good enough
- (iv) small, low-power bubble-jet printer – although not always necessary, this makes the package stand alone. It is probably not so necessary that the printer has a large battery capacity as printing can probably wait until a power point is found.

Input Device2:

Output Device1:

Output Device2:

(b) Tourist information system

Input Device1:

Tourist information system

This is likely to be in a public place. Most users will only visit the system once, so the information and mode of interaction must be immediately obvious.

- (i) touchscreen only – easy and direct interaction for first-time users (see also Chapter 3)
- (ii) NO mice or styluses – in a public place they wouldn't stay long!

Input Device2:

Output Device1:

Output Device2:

(d) Air traffic control system

Input Device1:

Air traffic control system

The emphasis is on immediately available information and rapid interaction. The controller cannot afford to spend time searching for information; all frequently used information must be readily available.

- (i) several specialized displays – including overlays of electronic information on radar
- (ii) light pen or stylus – high-precision direct interaction
- (iii) keyboard – for occasional text input, but consider making it fold out of the way.

Input Device2:

Output Device1:

Output Device2:

(e) Worldwide personal communications system

Input Device1:

Basically a super mobile phone! If it is to be kept on hand all the time it must be very light and pocket sized. However, to be a 'communications' system one would imagine that it should also act as a personal address/telephone book, etc.

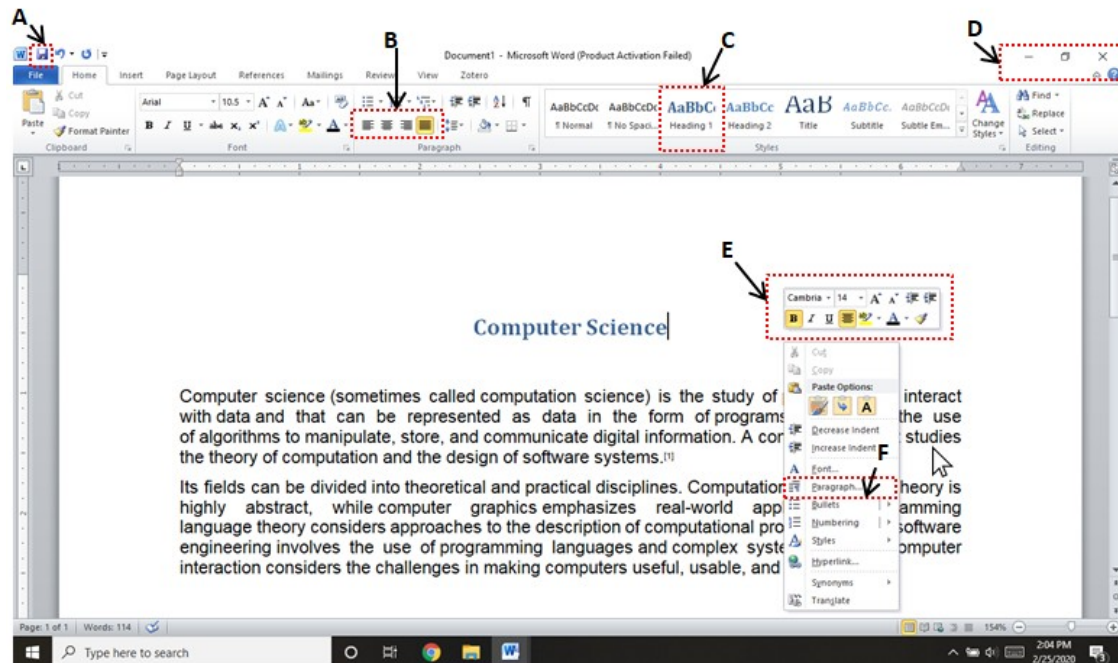
- (i) standard telephone keypad – the most frequent use
- (ii) small dedicated LCD display – low power, specialized functions
- (iii) possibly stylus for interaction – it allows relatively rich interaction with the address book software, but little space
- (iv) a 'docking' facility – the system itself will be too small for a full-sized keyboard(!), but you won't want to enter in all your addresses and telephone numbers by stylus!

Input Device2:

Output Device1:

Output Device2:

Question 2: Consider the following interface and labels.



According to Fitt's Law which regions of the screen (Labeled as A, B..., F) rank each with ease and accuracy to target with reference to cursor position. (Rank 1 as easiest or most accurate) **(12 Points)**

Rank	Label	Reason
1		
2		
3		
4		
5		
6		

Question4: What can a system designer do to minimize the memory load of the user? Give at least two options. **(4 Points)**

Discuss two ways of remembering. The interface designer can where possible allow recognition by providing information up front (e.g. labeled buttons). Where this is not possible support recall by using cues such as iconic images, categories of menu item. The answer may also discuss short term memory where chunking and restricting number of items are important.

Question5: A typical computer system comprises a QWERTY keyboard, a mouse and a color screen. There is usually some form of loudspeaker as well. You should know how the keyboard, mouse and screen work. If you were designing a keyboard for a modern computer, and you wanted to produce a faster, easier-to-use layout, what information would you need to know and how would that influence the design? **(2 Points)**

The information needed to redesign keyboard layout would include the frequency of letters or commands to be issued by the keyboard as well as empirical data on motor actions of the hands and fingers in performing typing actions. Various modified keyboard layouts do exist, such as the DVORAK keyboard, but none has been successful in supplanting the QWERTY standard.

- **common letters under dominant fingers**
- **biased towards right hand. 56% of keystrokes are made with the right hand**
- **Less switching between hands**
- **10-15% improvement in speed and reduction in fatigue**