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COMP 273 Assignment 3

3.

a) Polling & Byte mode:

1,000,000 * 200 = 200,000,000 cs

If we include 2 instructions for loading data and storing it, (which is 1,000,000 * 2 = 2,000,000 cs) , then it takes 202,000,000 cs

b) Polling & Block mode:

It takes the same amount of cs as in byte mode because polling needs to check whether it needs to read another byte after each byte.

200,000,000 cs

c) Interrupt & Byte mode:

1,000,000 * 500 = 500, 000, 000 cs

If we include 2 instructions for loading data and storing it, (which is 1,000,000 * 2 = 2,000,000 cs) , then it takes 502,000,000 cs

d) Interrupt & Block mode:

Interrupt happens when buffer is filled and buffer is filled 100 times.
Thus, 100 * 500 = 50,000 cs

If we include 2 instructions for loading data and storing it, (which is 100 * 2 = 200 cs) , then it takes 50,200 cs

e)

Polling & Byte mode: 200,000,000/500,000,000 = 40%

Polling & Block mode: 200,000,000/500,000,000 = 40%

Interrupt & Byte mode: 500, 000, 000/500,000,000 = 100%

Interrupt & Block mode: 50,000/500,000,000 = 0.01%

Polling loses at its time by checking for bytes.

f) DMA takes 1000cs + 500cs = 1500cs to load.

1500/500,000,000 = 0.0003%

DMA loses all its time by handing file transfer.

DMA works faster with large files than polling and interrupt but with a file with only few interrupts, polling and interrupt are more efficient than DMA.

g)

Polling is used for devices that don't need a quick response and that are constantly being used. Interrupt is faster than polling.

Interrupt is used for devices that need an immediate response and that are not always used.

DMA is used for moving large files when it is too big for CPU capacity. DMA is the fastest for data transfer.

h)

Polling: mouse, keyboard
Interrupt: capturing screenshot ex shift+command+4 in MacOS
DMA: transferring large files such as video files.

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