mp

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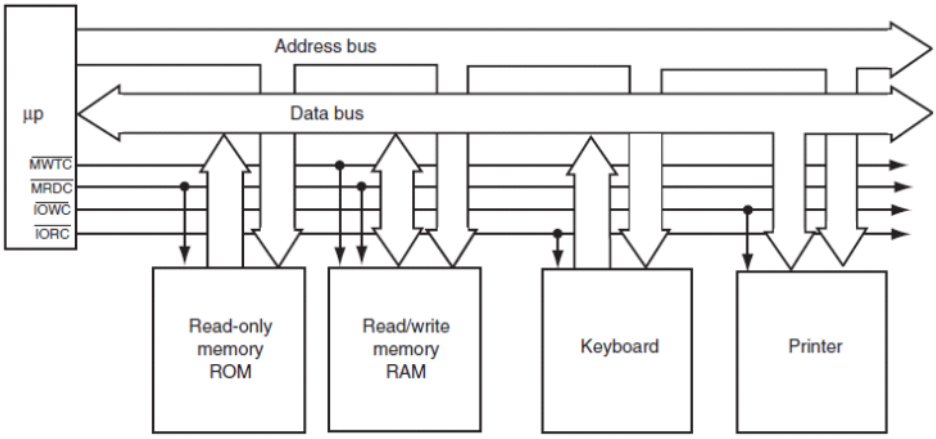
Draw the block diagram of the simple microprocessor based personal computer system, identifying the main components and buses.



Write down the three main tasks performed by microprocessors.

- The MP performs three main tasks:
  1. Data transfer between itself and the memory or I/O system.
  2. Simple arithmetic and logic instructions
  3. Program flow via simple decisions.

List the three types of buses used by the microprocessor indicating the type of information carried by each.

Buses

- A bus is a common group of wires that interconnect components in a computer system. They transfer address, data or control information between the MP and its memory and I/O systems.

What is an interrupt?

An interrupt is **a signal emitted by a device attached to a computer or from a program within the computer**. It requires the operating system (OS) to stop and figure out what to do next. An interrupt temporarily stops or terminates a service or a current process.

What is the advantage of using segment and offset addressing?

The segment and offset addressing scheme **allows both programs and data to be relocated without changing a thing in a program or data.**

2. (15 points) Perform the following base conversions between different number systems. Write the full number, do not perform any rounding.

a. (5 points) Convert unsigned binary 1011.1101 to decimal.

12.5

b. (5 points) Convert hexadecimal 0xDEFA to binary.

1101111011111010

c. (5 points) What number does unsigned decimal 170 represent in signed decimal system? (Use 8-bit representation.)

-86

3. (20 points) Answer the following questions considering the registers available in 8086 microprocessors.

a. (5 points) Which two registers are used for identifying the next line of code to be executed?

b. (5 points) Which two registers are used to access the stack? SP ESP

c. (5 points) Which two registers are used by the LODS and STOS instructions for identifying the target memory locations?

AL, AX

d. (5 points) Which two registers are used to store the result of MUL instruction for 16-bit multiplication?

AX