Review questions in the book

1. Architecture vs organization ??
2. Architecture vs Function ??
3. 4 main Functions ??
4. Main Structure Component of Computer ??
   cpu, Main memory, I/O, Buses
5. Main Structure of processor??
   ALU, Registers, control unit, internal buses

end of chapter 1

Lecture 3

Chapter 2
Computer Evolution & performance.

تطور الـ Computer
من الـ Vaccum tube. (مثل اللمبة)
فكان الصمام كان حتة من الدايرة
↓
Integrated Circuits

Computer الأولانية ← كانت بناية
عن طريق project اسمه
ENIAC
Electronic Numerical Integrator and Computer

كانت عايزة تنسلخنا في الحرب العالمية الثانية
الـ ENIAC لتفك الكود
مرات العاديز

the project Finished 1946
but later used in
hydrogen bomb

general purpose Computer.

ENIAC

Vaccum tubes ⇒ (18,000) — 2 Kys of power LE 140 Kw

which weight 30 tons,

it could do 5,000 addition per Sec.

By John Von Neumann

was Consultant in ENIAC

and Turing

⇒ Stored program Concept



⇐ for the instructions & the data.

EDVAC

Electronic Discrete Variable Computer

Princeton

PC Architecture

... of Von Neumann machine

المسؤول عن تنفيذ الأوامر

Arthimetic logic unit (CA) Central Arthimetical

Main Memory (M)

Data Instruction

it means binary coded low level Instruction

Program Control Unit (CC) Central Control

هو الذي نقرأ الـ instruction من الـ memory لتنفيذ

I/O Equipment

external world or peripheral

Memory

1000 X 40bit words

word

byte 2 هو

Standard

processor تختلف من

processor

word 2byte

لو بينقل 2byte بيتقل

M

Data Instruction

999

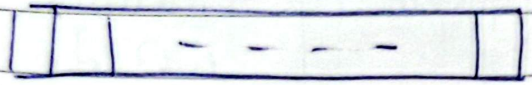
0

39

RAM

number instruction

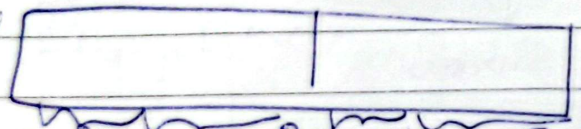
Data word



0/1 sign bit → +ve / -ve

1 — 39 Binary number

Instruction word



left Instruction

Right Instruction

Op Code (8bit)

Address (9→20)

operation

0 → 7 | 8 → 11

01101110 | Address

1 out of 1000 word

Central control

Mov, ADD, Sub, Mul

word

Data

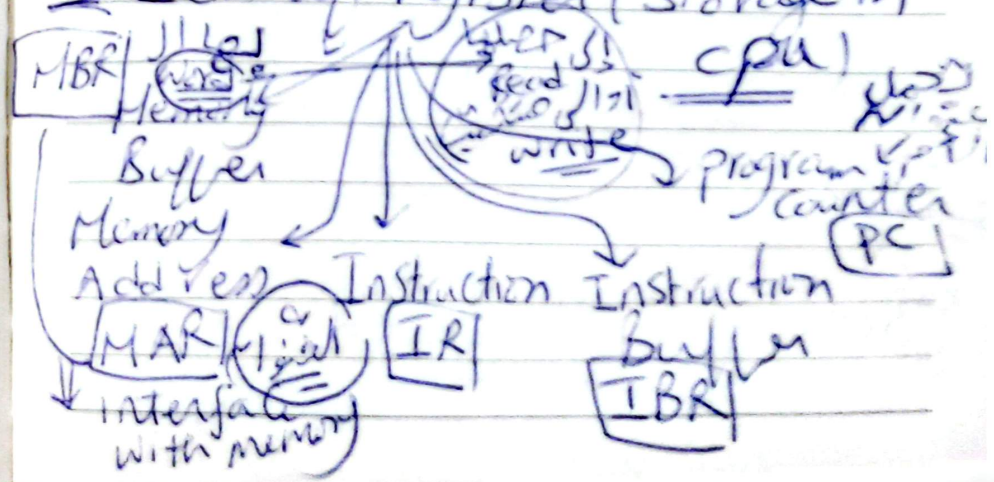
Sign + Number word

Instruction

left inst | Right inst

op Address | op Address

Set of registers (Storage in CPU)



Review

PC ⟷ I/O

IAS — interface — Peripherals (external world)

Instructions

8 bit	12 bit
opCode	address

2 bit: 00 – 01 – 10 – 11 — 2^2

$2^{12} \Rightarrow 2^2 \times 2^{10}$

4 × 1024

4 K

We use Zero only for memory

4096 ⇒ 4000

Zero

Will be related to I/O later will be explained in details

Accumulator (AC)

Multiplier Quotient

داخل الـ CPU

لعمليات الضرب والقسمة

⇒ PC

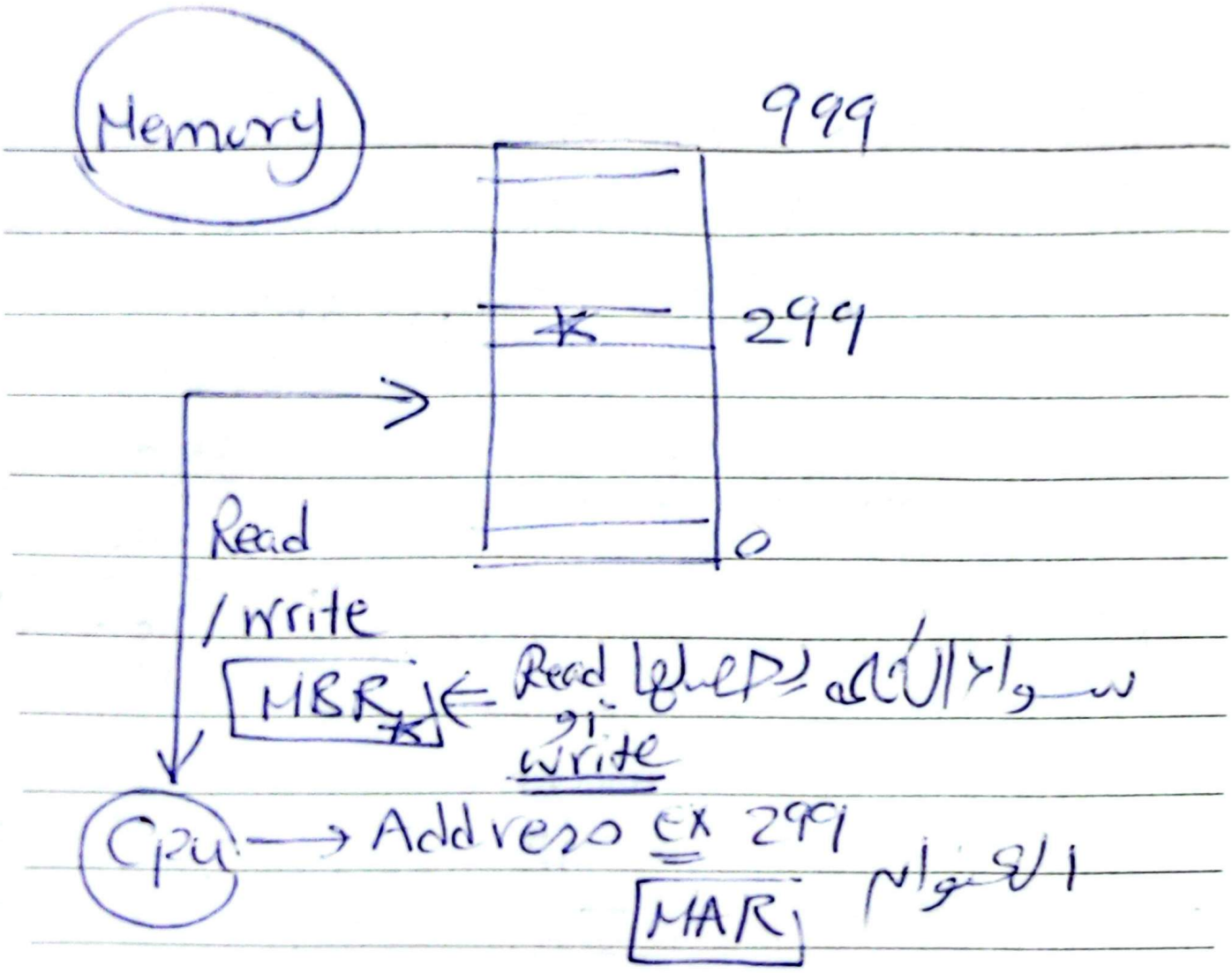
يحمل عنوان الأمر الذي عليه الدور في التنفيذ

⇒ IR — 8 bit opCode

⇒ IBR — Right hand Instruction يحمل الـ

Left Instruction — opCode + Address

Registers implemented & located in CPU



MAR: Memory [Address] Register

MBR: Memory Buffer Register

[Content]