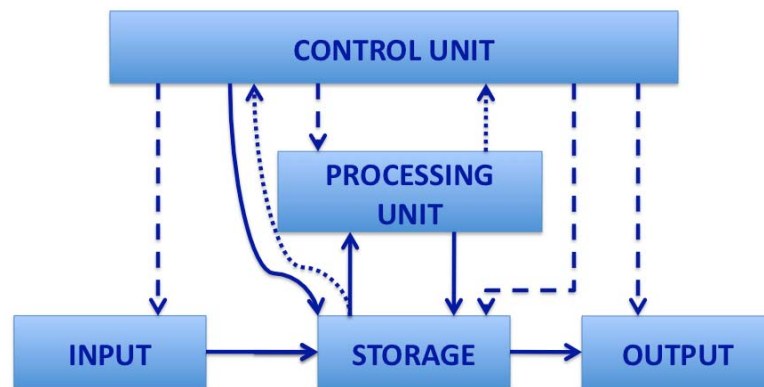


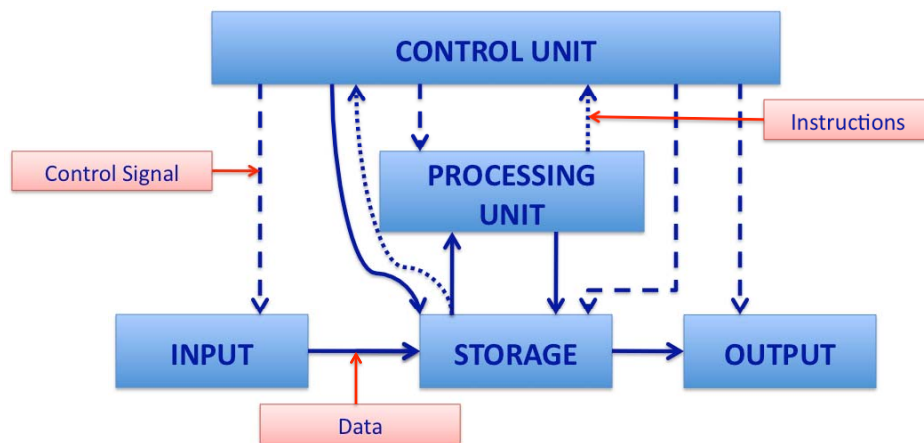
SAMOS



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SAMOS



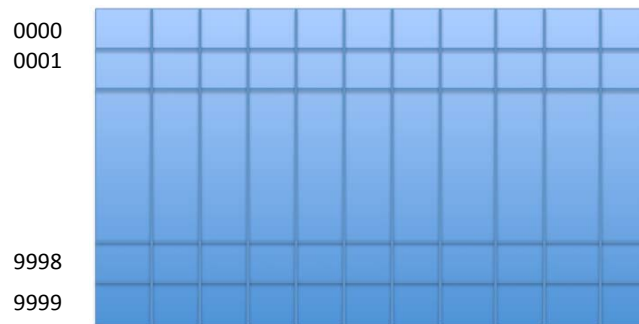
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2

SAMOS

- Storage (Data & Instructions)

- 10,000 Separate Cells (0000 to 9999)



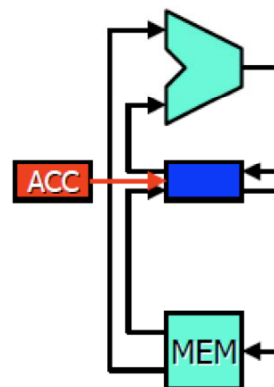
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SAMOS

- Processing Unit

- Accumulator



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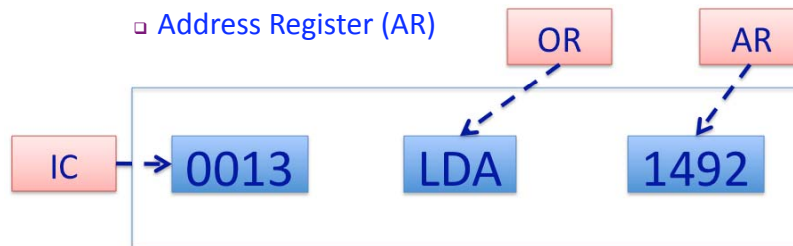
4

SAMOS

Control Unit

Several Special Cells (Registers)

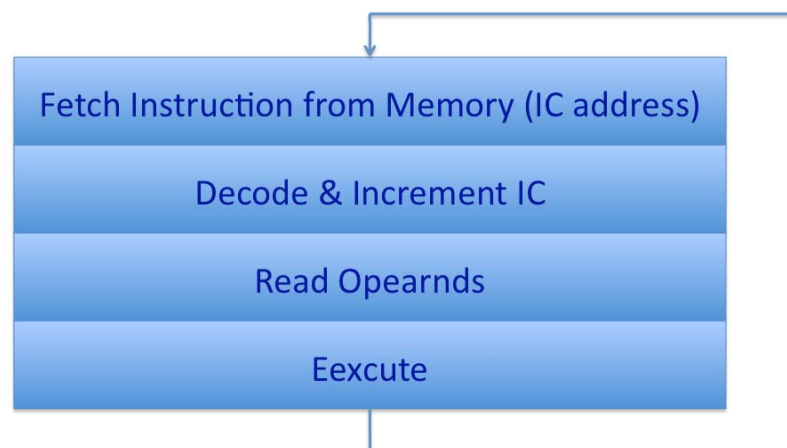
- Instruction Counter (IC) (or Program Counter)
- Operation Register (OR)
- Address Register (AR)



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5

Execution Cycle



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6

Executing a Program

- Reading the program from Input
- Loading the program into the memory
- Starting from address 0000
 - How about having data in address 0000

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7

SAMOS INSTRUCTION SET

▪ Load

▫ LDA

+	L	D	A	0	0	0	1	4	9	2
---	---	---	---	---	---	---	---	---	---	---

▪ Store

(ACC) \leftarrow (1492)

▫ STO

+	S	T	O	0	0	0	0	5	0	0	1
---	---	---	---	---	---	---	---	---	---	---	---

(5001) \leftarrow (ACC)

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8

SAMOS INSTRUCTION SET

■ Addition

□ ADD

+	A	D	D	0	0	0	7	2	2	5
---	---	---	---	---	---	---	---	---	---	---

■ Subtraction $(ACC) \leftarrow (ACC) + (7225)$

□ SUB

+	S	U	B	0	0	0	6	0	0	8
---	---	---	---	---	---	---	---	---	---	---

$$(ACC) \leftarrow (ACC) - (6008)$$

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9

SAMOS INSTRUCTION SET

■ Multiply

□ MPY

+	M	P	Y	0	0	0	4	1	4	0
---	---	---	---	---	---	---	---	---	---	---

■ Divide $(ACC) \leftarrow (ACC) * (4140)$

□ DIV

+	D	I	V	0	0	0	1	0	7	8
---	---	---	---	---	---	---	---	---	---	---

$$(ACC) \leftarrow (ACC) / (1078)$$

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10

SAMOS INSTRUCTION SET

- **Halt**

- **HLT**

+	H	L	T	0	0	0	2	0	2	2
---	---	---	---	---	---	---	---	---	---	---

(IC) \leftarrow 2022

- **Branch Unconditional**

- **BRU**

+	B	R	U	0	0	0	7	7	7	7
---	---	---	---	---	---	---	---	---	---	---

(IC) \leftarrow 7777

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11

SAMOS INSTRUCTION SET

- **Branch Conditional**

- **BMI**

+	B	M	I	0	0	0	1	7	2	9
---	---	---	---	---	---	---	---	---	---	---

If ((ACC) < 0):

(IC) \leftarrow 1729

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12

SAMOS INSTRUCTION SET

Read

RWD

+	R	W	D	0	0	0	3	3	4	6
---	---	---	---	---	---	---	---	---	---	---

(3346) \leftarrow (first 11 columns of next data)

Write

WWD

+	W	W	D	0	0	0	2	6	7	2
---	---	---	---	---	---	---	---	---	---	---

(output) \leftarrow (2672)

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0000	BRU	000	0004
0001	000	000	0000
0002	000	000	0001
0003	000	000	1000
0004	LDA	000	0001
0005	STO	000	0100
0006	LDA	000	0002
0007	STO	000	0101
0008	LDA	000	0101
0009	ADD	000	0100
0010	STO	000	0102
0011	LDA	000	0003
0012	SUB	000	0102
0013	BMI	000	0022
0014	LDA	000	0101
0015	STO	000	0100
0016	LDA	000	0102
0017	STO	000	0101
0018	LDA	000	0101
0019	ADD	000	0100
0020	STO	000	0102
0021	BRU	000	0011
0022	WWD	000	0102
0023	HLT	000	0000

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