Computer Organization and Architecture Project CCCS 217

GROUP OF MEMBERS

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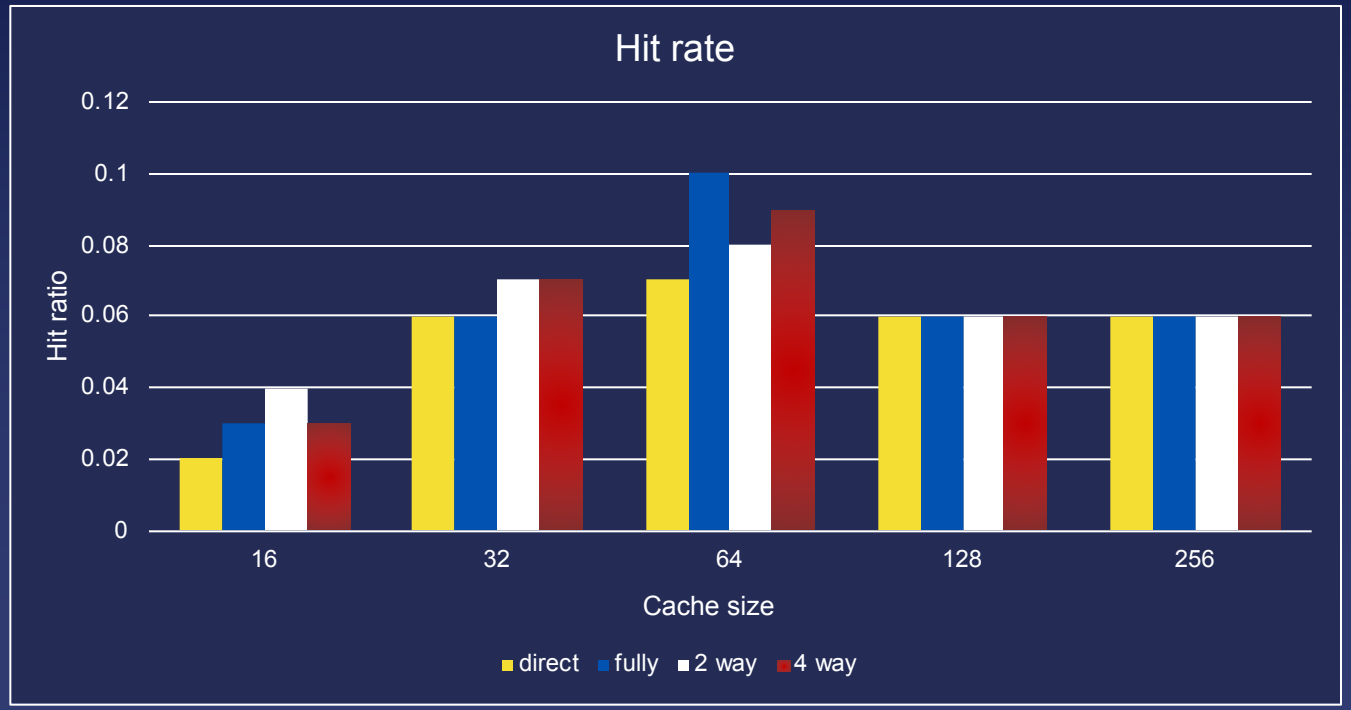
CONTENTS

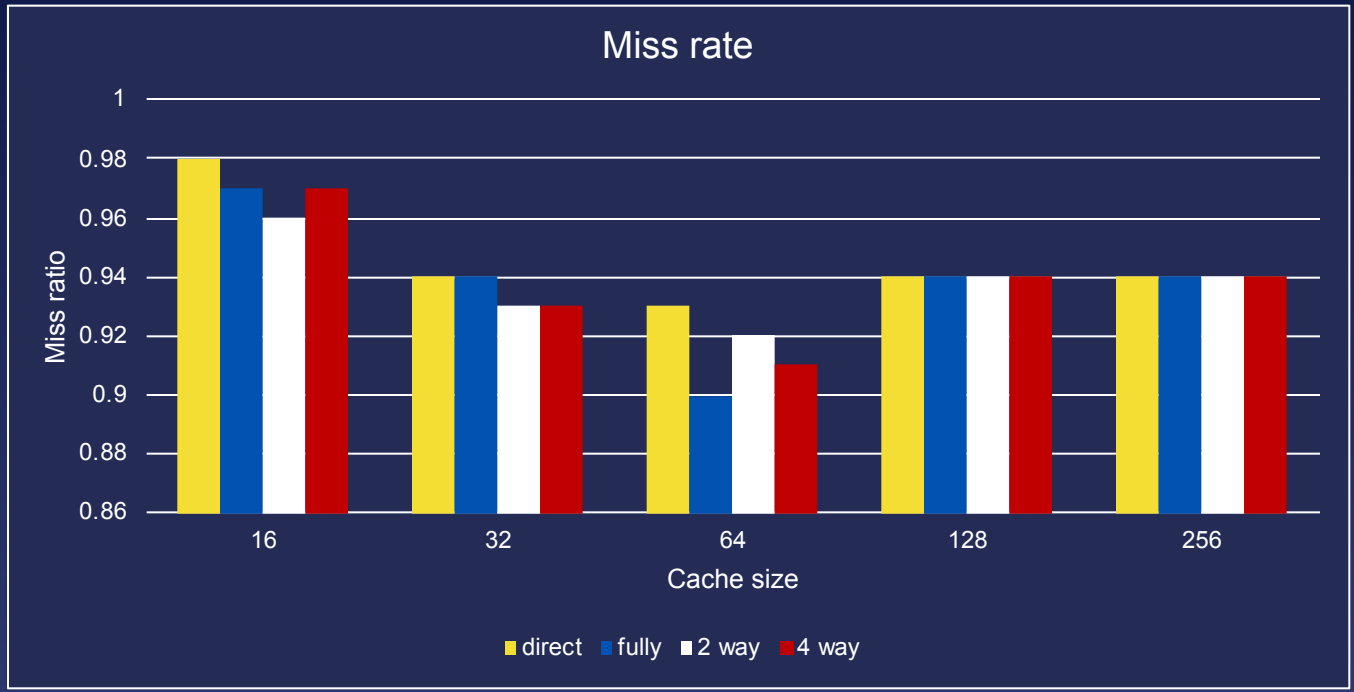
A - SAME SIZE OF CACHE

Memory Size: 512



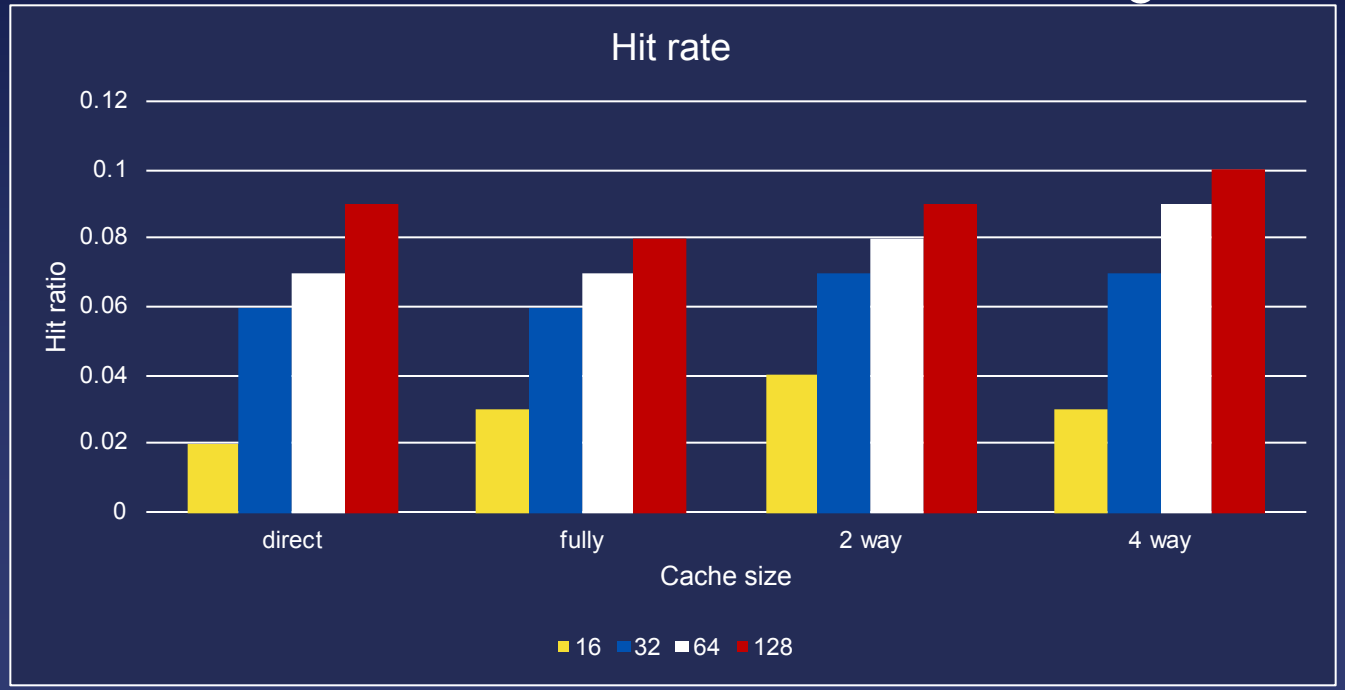
A - SAME SIZE OF CACHE

Memory Size: 512



B - DIFFERENCE SIZE OF CACHE

Memory Size: 512



C-

Memory Size: 512

D- Direct Mapping

Tag	Index(line)	Offset (Word)
100	000100	0
3 bit	6 bit	0 bit

```
MEMORY SIZE = 512->2^9, CACHE SIZE= 64 -> 2^6, BLOCK/LINE OFFSET=0

PHYSICAL ADDRESS = LOG2 512 = 9 BITS
9 BITS WILL BE DIVIDED INTO TAG AND CACHE LINE
NUMBER OF LINES = CACHE SIZE/ LINE SIZE
NUMBER OF LINES = 2^6/ 2^0 = 2^6-> LINE INDEX OF 6 BITS
NUMBER OF BLOCKS = MEMORY SIZE / BLOCK SIZE
NUMBER OF BLOCKS = 2^9/2^0 = 2^9-> BLOCK INDEX OF 9 BITS
TAG = BLOCK INDEX -LINE INDEX
TAG = 9-6=3 BITS
TAG OF 3 BITS WILL IDENTIFY WHICH PARTICULAR BLOCK IS
CURRENTLY STORED IN A SPECIFIC LINE.
```

D- Fully Associative

Tag	Offset (Word)
100010100	0
9 bit	0 bit

```
MEMORY SIZE = 512->2^9, CACHE SIZE= 64 -> 2^6, BLOCK/LINE OFFSET=0

PHYSICAL ADDRESS = LOG2 512 = 9 BITS

NUMBER OF BLOCKS = CACHE SIZE / BLOCK SIZE
NUMBER OF BLOCKS = 2^9/2^0 = 2^9-> BLOCK INDEX OF 9 BITS

TAG BIT SIZE = BLOCK INDEX
TAG= 9 BITS
```

D- 2-Way associative

Tag	Index (Set)	Offset (Word)
111	**100110**	**0**
3 bit	6 bit	0 bit

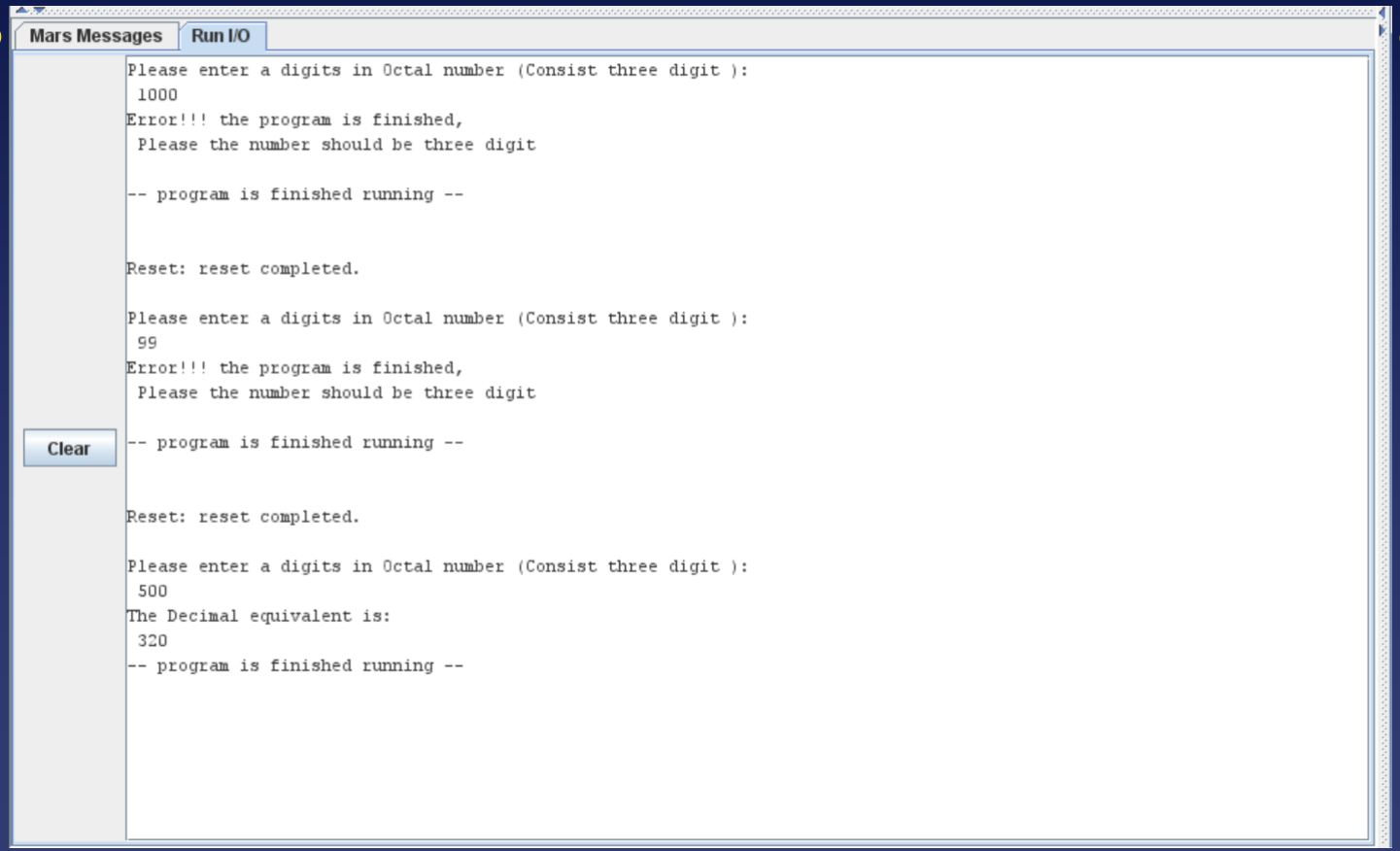
```
MEMORY SIZE = 512->2^9, CACHE SIZE= 64 -> 2^6, BLOCK/LINE OFFSET=0
PHYSICAL ADDRESS = LOG2 512 = 9 BITS
9 BITS WILL BE DIVIDED INTO TAG AND SET INDEX
NUMBER OF LINES = CACHE SIZE/ LINE SIZE
NUMBER OF LINES = 2^6/2^0 = 2^6
NUMBER OF SET = NUMBER OF LINES / SET SIZE
NUMBER OF SET = 2^6/2^2 = 2^6
SET INDEX = 4 BITS
TAG = ADDRESS LENGTH -(NUMBER OF SET+OFFSET)
TAG = 9-(6+0)=3 BITS
TO  IDENIFY WHICH BLOCK IS MAPPED TO A SPECIFIC LINE, WE ONLY SEARCH
INSIDE THE SET THAT THE BLOCK IS MAPPED TO USING COMPARATOS OF SIZE
BITS.
```

D- 4-Way associative

Tag	Index (Set)	Offset (Word)
00111	**1100**	**0**
5 bit	4 bit	0 bit

```
MEMORY SIZE = 512->2^9, CACHE SIZE= 64 -> 2^6, BLOCK/LINE OFFSET=0
PHYSICAL ADDRESS = LOG2 512 = 9 BITS
9 BITS WILL BE DIVIDED INTO TAG AND SET INDEX
NUMBER OF LINES = CACHE SIZE/ LINE SIZE
NUMBER OF LINES = 2^6/2^0 = 2^6
NUMBER OF SET = NUMBER OF LINES / SET SIZE
NUMBER OF SET = 2^6/2^2 = 2^4
SET INDEX = 4 BITS
TAG = ADDRESS LENGTH -(NUMBER OF SET+OFFSET)
TAG = 9-(4+0)=5 BITS
TO  IDENIFY WHICH BLOCK IS MAPPED TO A SPECIFIC LINE, WE ONLY SEARCH
INSIDE THE SET THAT THE BLOCK IS MAPPED TO USING COMPARATOS OF SIZE 5
BITS.
```

OUTPUT OF CODE




THANKS FOR
LISTENING