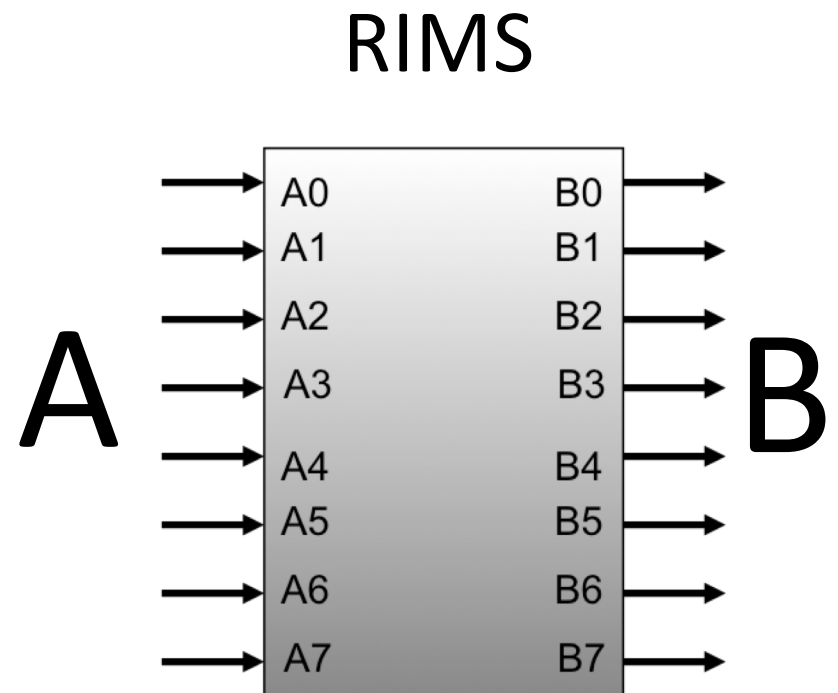


RIMS Microcontroller Architecture

- In-class exercises, quizzes, and exams will be based on RIMS
- Key things to understand:
 - Input: A
 - Output: B



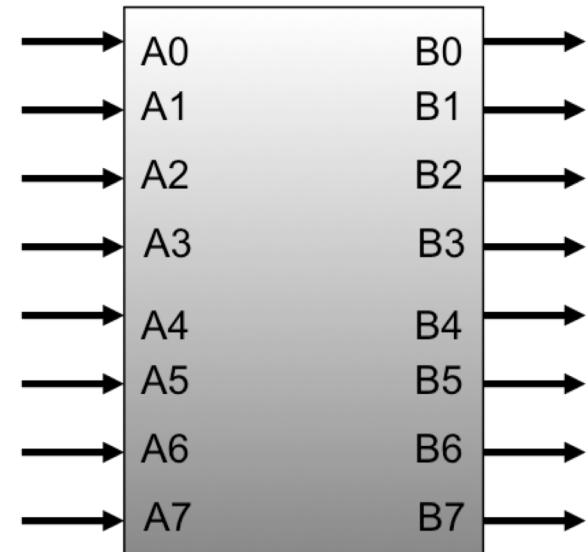
Core Concepts

```
// Built-in variable A, representing RIMS'  
// 8 input pins as a single 8-bit variable  
unsigned char A;
```

```
// Built-in variable B, representing RIMS' 8  
// output pins as a single 8-bit variable  
unsigned char B
```

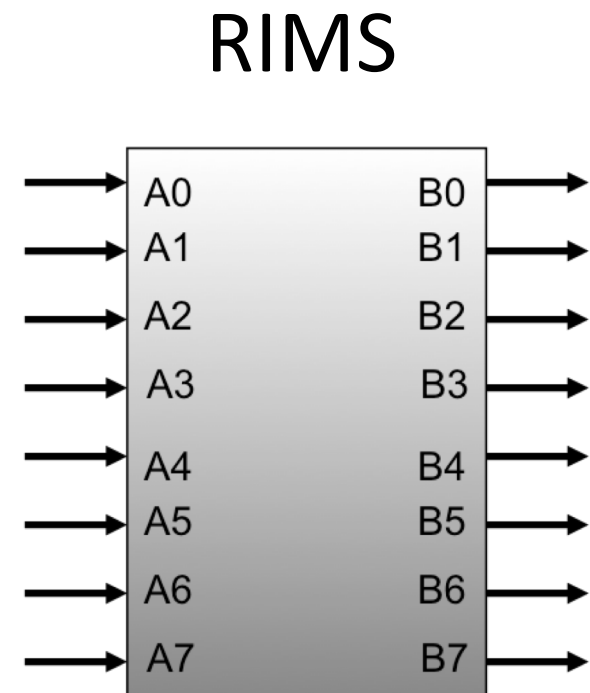
- This means that you cannot create your own variables named A and B
- You cannot write to A
- You cannot read from B

RIMS



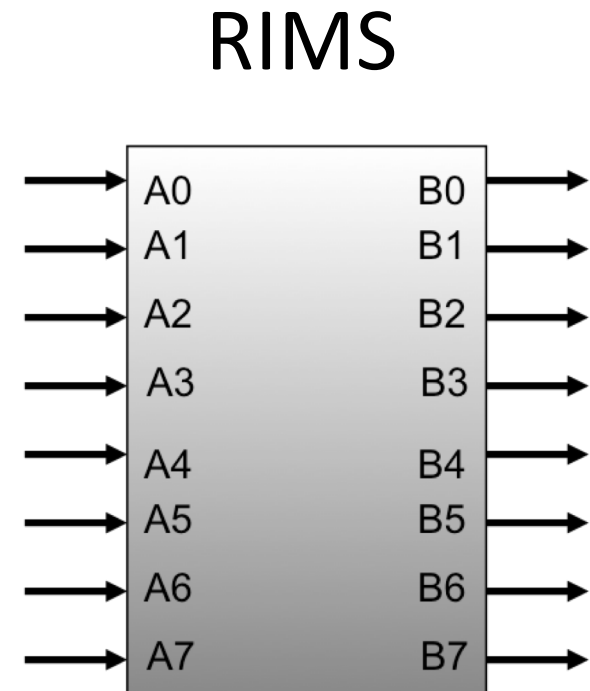
Core Concepts

- You have read access to the individual input bits, A0-A7
- You have write access to the individual output bits B0-B7
- You **cannot** read from or write to groups of bits:
 - A[2-5], B[2, 4, 7], etc.



Core Concepts

- You have read access to the individual input bits, A0-A7
- You have write access to the individual output bits B0-B7
- You **cannot** read from or write to groups of bits:
 - ~~A[2-5], B[2, 4, 7], etc.~~



Simple Examples

- Set B to 3x the value of A (ignoring overflow)

$$B = 3 * A;$$

- Copy bits A3 to B3 and A4 to B4

$$B3 = A3; B4 = A4;$$

or

$$B = A \& (0x18);$$

Masking

- $B = A \& (0x18);$



Masking

- $B = A \& (0x18);$

	A7	A6	A5	A4	A3	A2	A1	A0
	0x1				0x8			
&								
&	0	0	0	1	1	0	0	0
	B7	B6	B5	B4	B3	B2	B1	B0

Masking

- $B = A \& (0x18);$

	A7	A6	A5	A4	A3	A2	A1	A0
	0x1				0x8			
&	0	0	0	1	1	0	0	0
&	0	0	0	A4	A3	0	0	0
=	0	0	0	A4	A3	0	0	0
	B7	B6	B5	B4	B3	B2	B1	B0