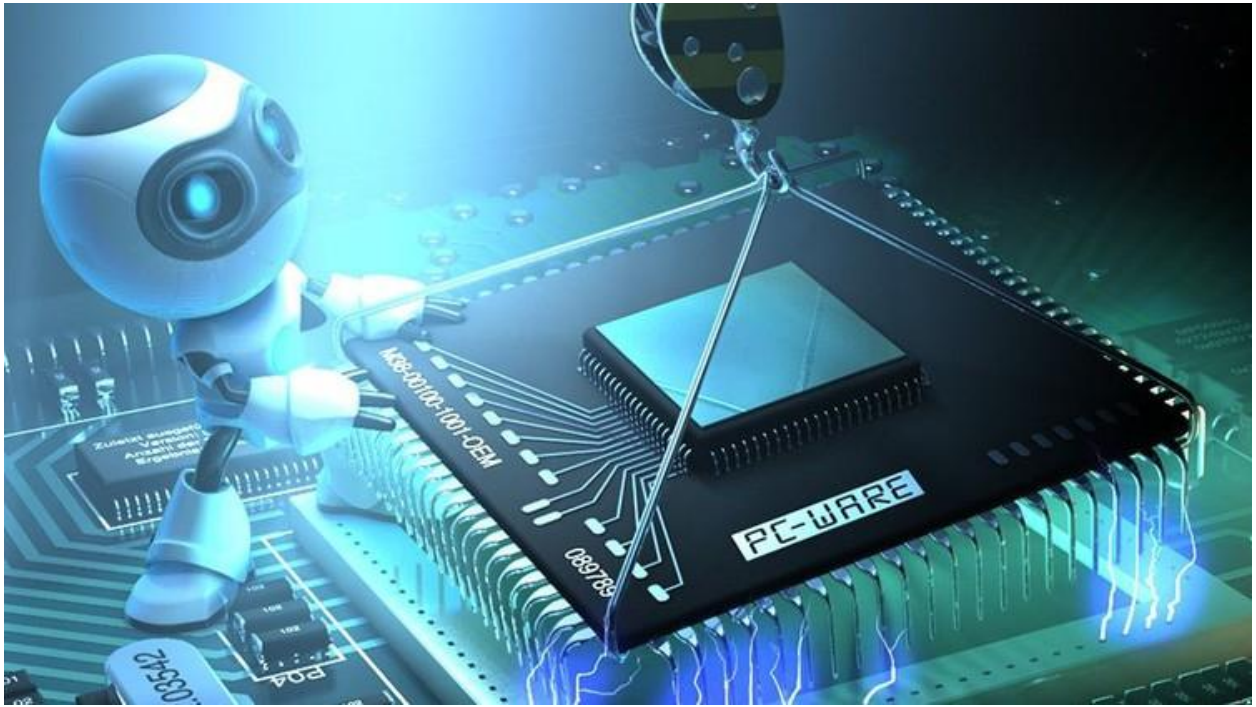
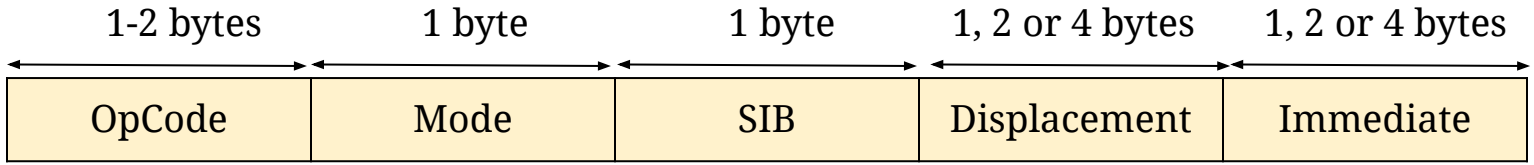
Instruction Encoding



Instruction Encoding



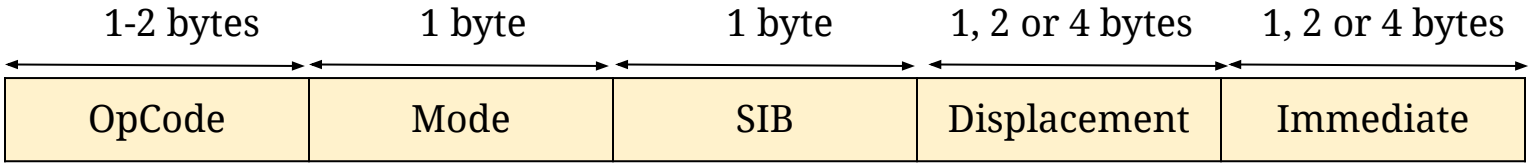
General format of the instructions

```
MOVL $37, -40(%ebp,%esi, 4)
```

- **OpCode** codifies:
  - the operation to perform
  - the size of the operands
  - which is the source operand and which is the destination
  - if the source operand is an immediate or register/memory

- **Mode** codifies:
  - the addressing mode of the memory operand if any
  - the register for register operands
  - indicates if there is displacement in the case that an operand is in memory

Instruction Encoding

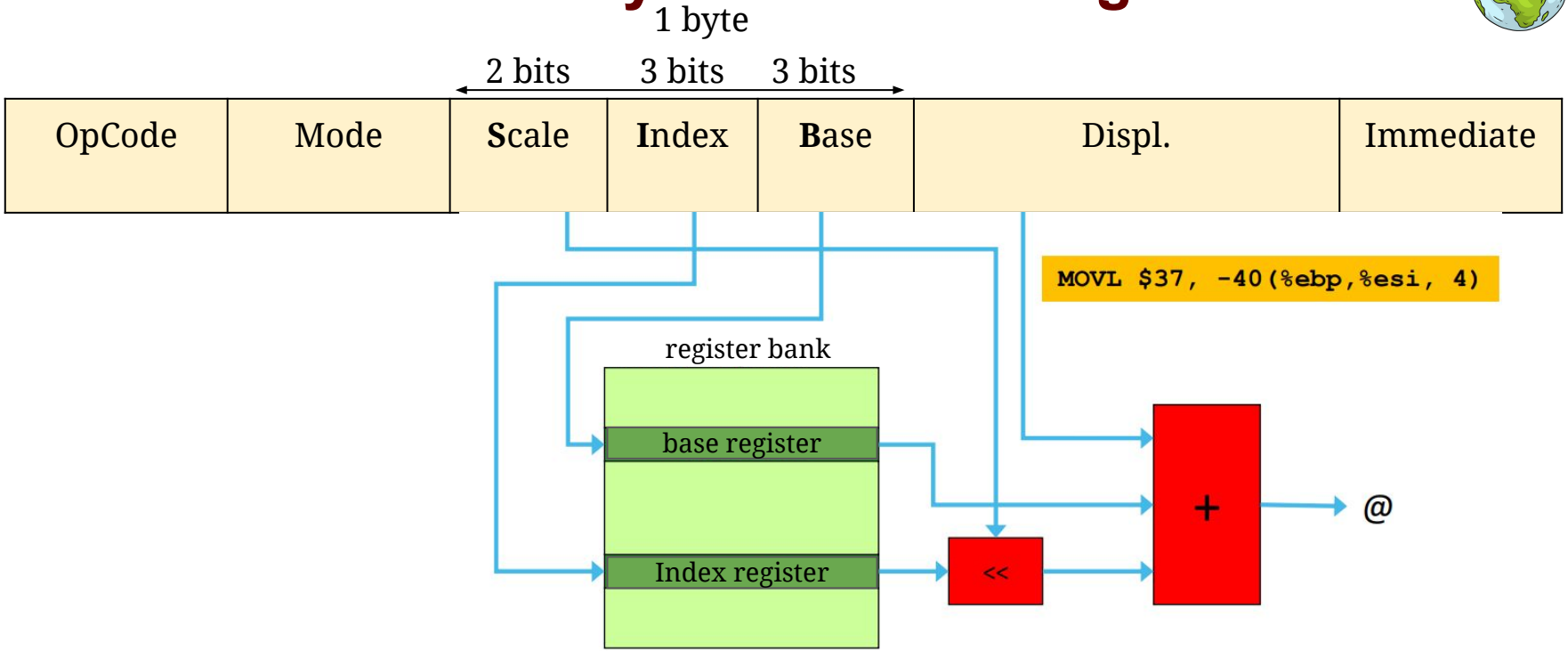


General format of the instructions

```
MOVL $37, -40(%ebp,%esi, 4)
```

- **SIB** codifies:
  - The scale (S)
  - The index register (I)
  - The base register (B)

Memory Mode Encoding



Possible values of Scale: 0, 1, 2, 3 (is equivalent to multiplying by 1,2,4,8 respectively)