



# CMSC 124

Design and Implementation  
of Programming Languages

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## Influences on Language Design

1. Readability
2. Writability
3. Reliability
4. Cost
5. Portability
6. Generality
7. Well-definedness

### Computer Architecture

### Computer Architecture

the *design of the hardware*  
where the program will run

### Computer Architecture

most PLs were designed around  
the most popular architecture:  
the *von Neumann architecture*.

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### von Neumann Architecture

### von Neumann Architecture

created by  
*John von Neumann*  
and others



### von Neumann Architecture

the *program and data*  
*are stored in the memory*  
while each command is  
*executed by the CPU.*

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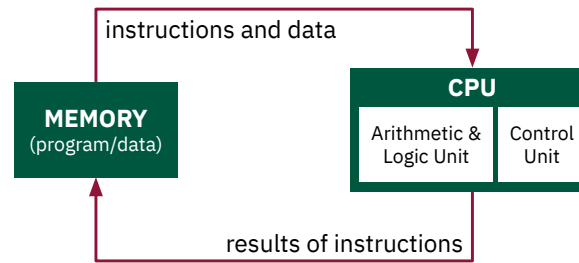
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## von Neumann Architecture

### fetch-decode-execute cycle

1. Fetch instruction/data. Increment the program counter to point to the next instruction.
2. Decode instruction.
3. Execute instruction.

## von Neumann Architecture



## von Neumann Architecture

since the *program is* loaded in contiguous memory cells, *step-by-step execution* of instructions will be efficient in this architecture.



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