Role Card:

Memory (RAM = Random Access Memory)

Task:

Storing program and data

Function:

- If you receive from the control bus the command **read**:
  1. Read address from address bus
  2. Give corresponding memory content to data bus

- If you receive from the control bus the command **write**:
  1. Read address from address bus
  2. Write data from data bus into corresponding memory

Role Card:

Data Bus

Task:

Move data between CPU and memory (RAM) (in both directions)

Function:

Transport data between CPU and Memory.

Role Card:

Adress Bus

Task:

Bring addresses from CPU (Adress Register or Program Counter) to the memory

Function:

If a new value is stored in the program counter or in the address register, bring this address to the memory.

Role Card:

Control Bus

Task:

Determine if it should be read from or written to the memory.
Receives this command from the control unit and passes it on to the memory.

Function:

Transport the commands **read** or **write** from the control unit to the memory.

Role Card:

Command Register and Control Unit

Task:

Loading the commands from the memory and executing them

Function:

1. Fetch command:
   1. Put content of program counter to the address bus
   2. Set the control bus to **read**
   3. Store the content of the data bus in the command register

2. Decode the command in the command register
   (which command is it? -> use the command decoder table)

3. Execute the command (according to the command card of the command)

4. Go back to step 1. (next command)

Role Card:

Arithmetic Logic Unit (ALU), Registers

Task:

Execute arithmetic (i.e. calculating) and logical commands (i.e. compare numbers),
Keeping track of register contents

Function:

- On request of the control unit: add the Registers A and B and store the result in register C.
- On request of the control unit: Add or subtract values to/from the program counter
- Keep track of register values (slip of paper)

Role Card:

Adress Register and Program Counter

Task:

Keeping track of address register and program counter value

Function:

As soon as the control unit or the ALU write a new value in one of these registers, note this value and pass it on to the address bus.