Programming Concepts

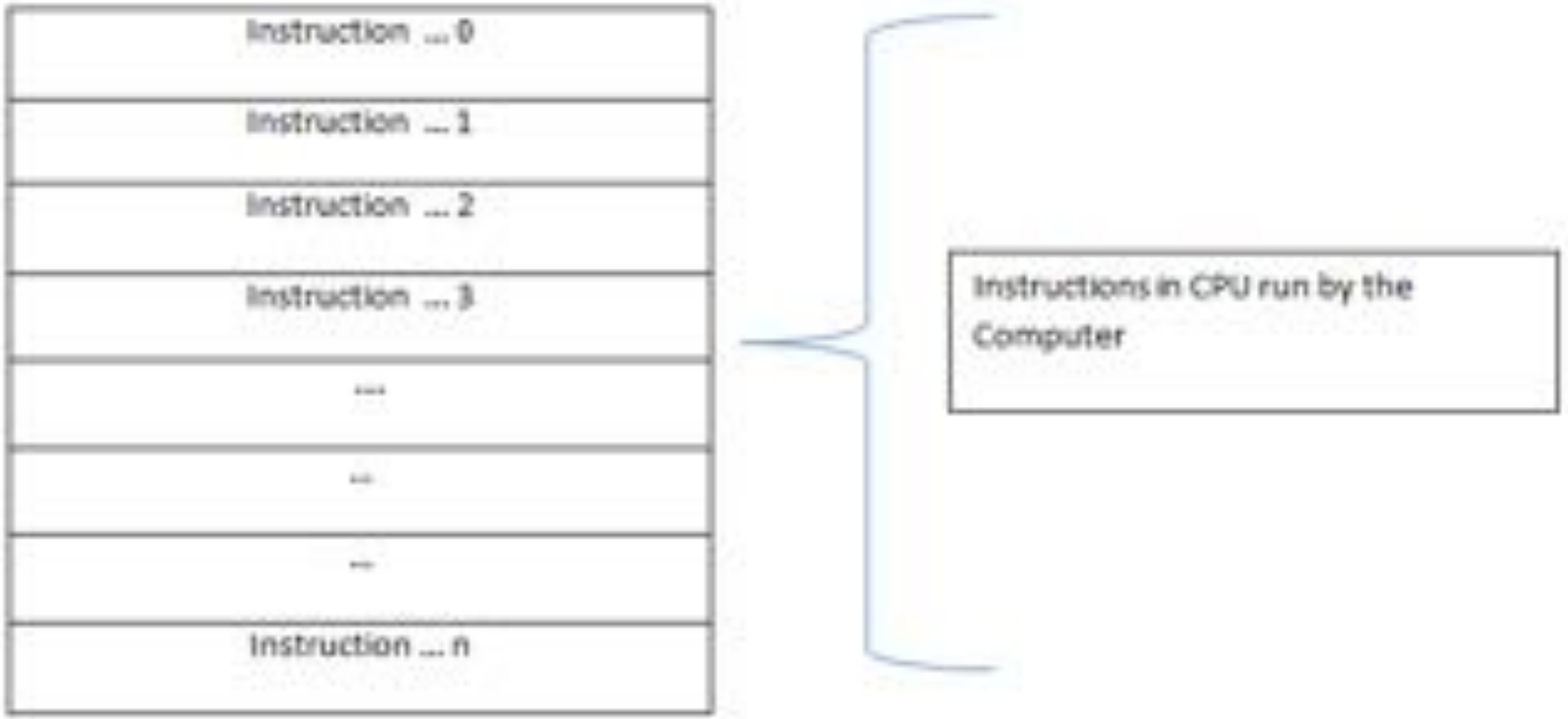
What is a Program

A program is a set of instructions that the computer executes.

What is a Program – To be more Precise

To be more precise, a program is a set of instructions loaded in the CPU that the CPU executes to achieve an outcome

A Program is mainly set of Instructions



Demonstrating add.sh & Execution Thread

```
  GNU nano 2.0.6                File: add.sh

#!/bin/bash -x
x=100;
y=100;
z=$(( $x + $y ))
echo $z
```

add.sh program with following Instructions

1. **Variable $x Declaration and Assignment**
2. **Variable $y Declaration and Assignment**
3. **Addition of $x and $y and assigning to variable $z**
4. **Displaying $z**
5. **NOTE : Arithmetic Expression *$((expression))***

```
Narayans-MacBook-Pro:TerminalCommands narayan$ nano add.sh
Narayans-MacBook-Pro:TerminalCommands narayan$ ./add.sh
+ x=100
+ y=100
+ z=200
+ echo 200
200
Narayans-MacBook-Pro:TerminalCommands narayan$
```

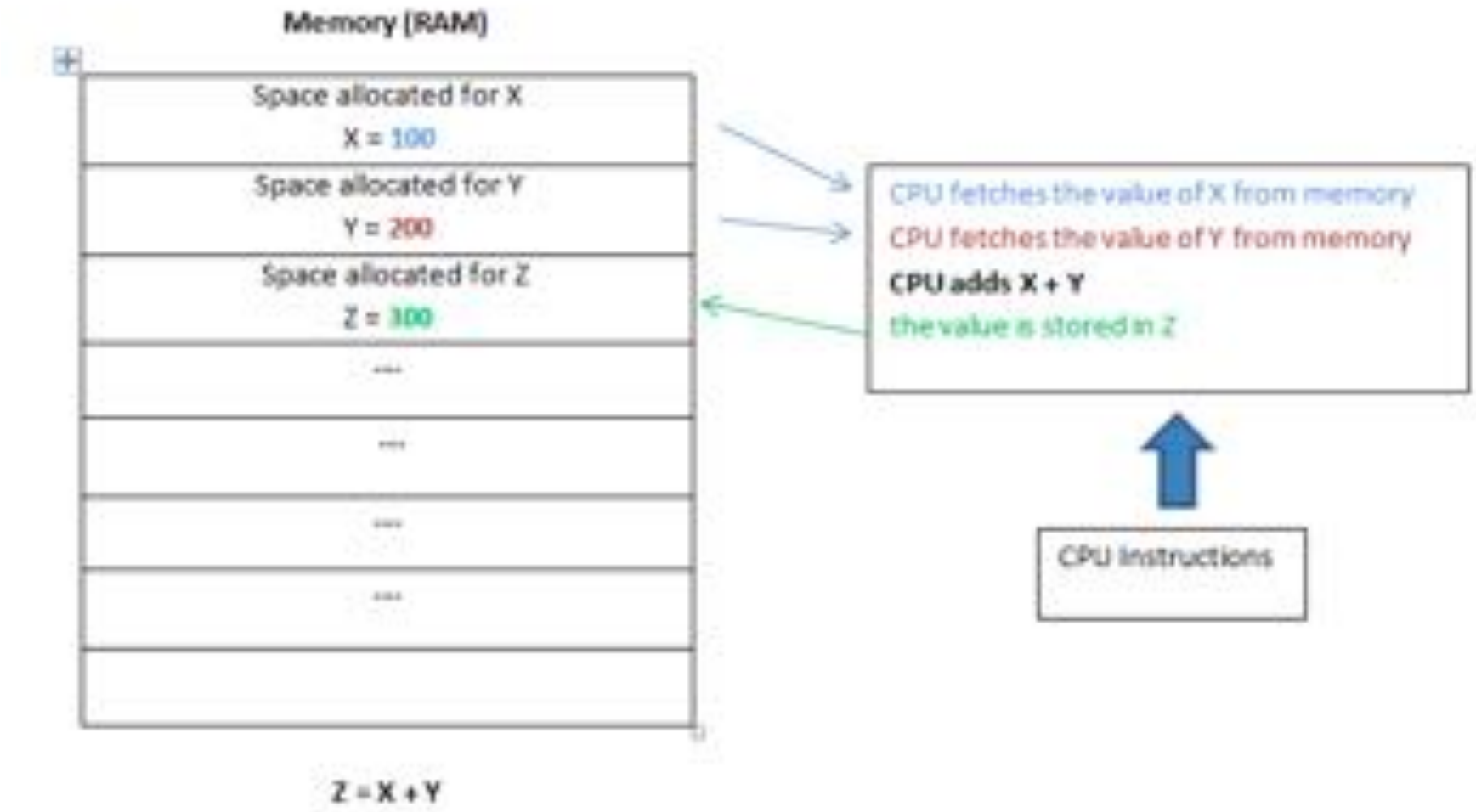
Terminal showing 4 execution steps indicated by "+"

1. **Space allocated in RAM for $x**
2. **Space allocated in RAM for $y**
3. **CPU fetches value of $x and $y from memory. Adds $x + $y and stores the value in $z**
4. **Display the value of $z**

Core Hardware Components to Run a Program

- The two major components to execute a program are
- *i) CPU to* runs a set of instructions and
  ii) Memory (RAM) that works as a temporary storage to help the CPU achieve the desired output/outcome.

A Program is mainly set of Instructions



Demonstrating add.sh & Execution Thread

TerminalCommands — nano add.sh — 75×21

```
  GNU nano 2.0.6                File: add.sh

#!/bin/bash -x
read -p "Enter first number: " x
read -p "Enter second number: " y
z=$(( $x + $y ))
echo $z
```

TerminalCommands — -bash — 75×21

```
Narayans-MacBook-Pro:TerminalCommands narayan$ nano add.sh
Narayans-MacBook-Pro:TerminalCommands narayan$ ./add.sh
+ read -p 'Enter first number: ' x
Enter first number: 100
+ read -p 'Enter second number: ' y
Enter second number: 100
+ z=200
+ echo 200
200
```

Thankyou