



EG-212

Computer

Architecture

Assignment-1

TEAMMATES

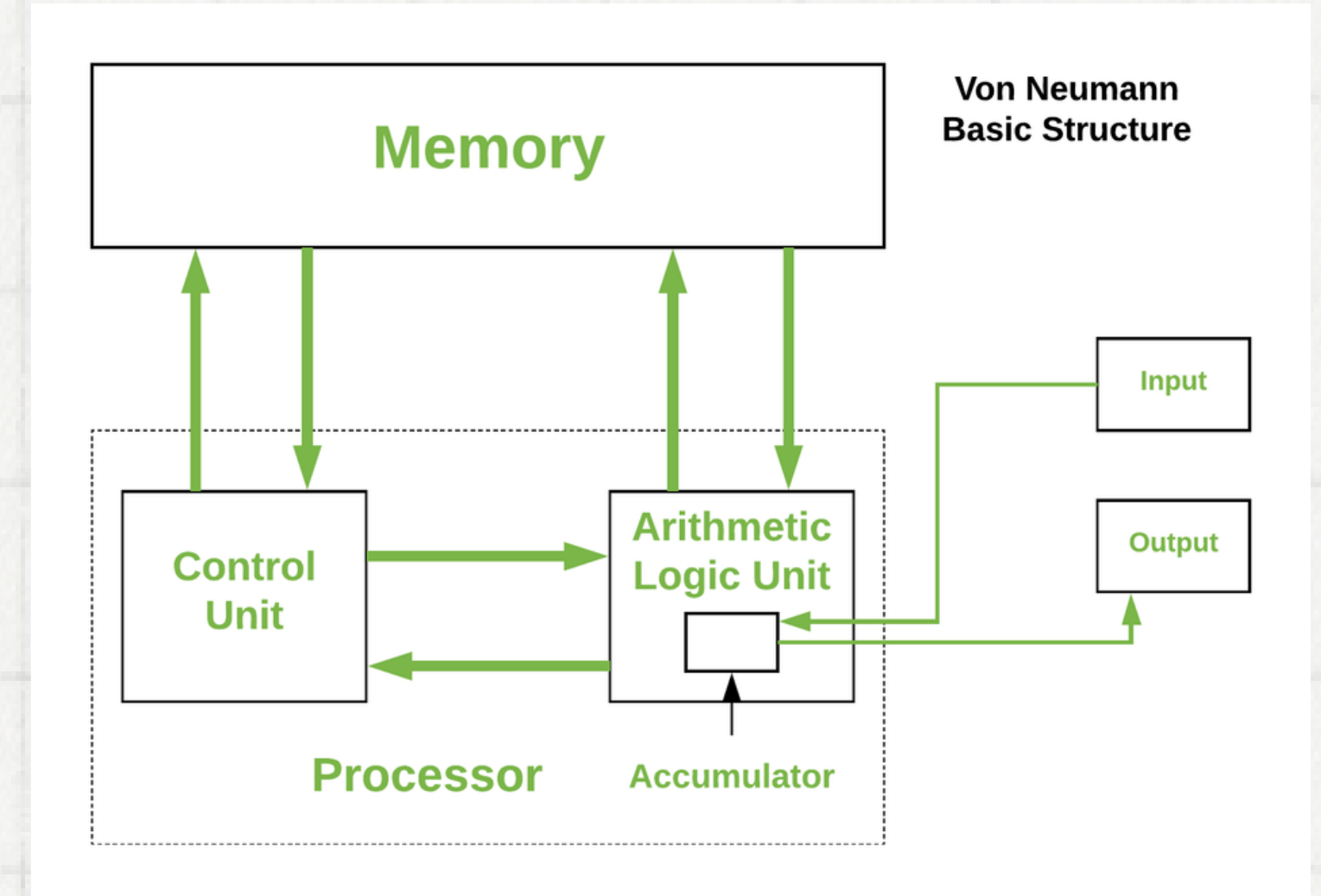
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IAS: Institute Of Advanced Study in Princeton

- *Also known as Princeton Machine.
- *As known as IAS Machine (IAS: Institute Of Advanced Study In Princeton).
- *It was built out of 1700 vacuum tubes (450kg).
- *These tubes contain electrodes for controlling electron flow.
- *Keeps programs, instruction, data in memory
- *ALU: Operates on Data
- *Control Unit: Controls & interprets the instructions
- *Input and Output (I/O): Peripherals




```
#include<stdio.h>

void main(){
    int a=12;
    int b=40;
    int max;
    int min;
    int temp;
    (a>b) ? (max=a) : (max=b);
    (a>b) ? (min=b) : (min=a);
    while (b>0){
        temp=a;
        a=b;
        b=temp%b;
    }
    int c=1;
    int lcm=max*c;
    while (lcm%min!=0){
        c=c+1;
        lcm=max*c;
    }
    printf("The HCF of %d and %d is %d.\n",min,max,a);
    printf("The LCM of %d and %d is %d.\n",min,max,lcm);
}
```

- **The code starts by declaring two integer variables, a and b, with values of 12 and 40 respectively.**
- **Then it declares two more integer variables, max and min, which will be used to store the maximum and minimum values between a and b.**
- **Next, there is an if-else statement using the ternary operator (? :).**
- **This is a shorthand way of writing an if-else statement where the condition is placed before the question mark (?), followed by what should happen if the condition is true (max=a) after the colon (:), followed by what should happen if the condition is false (max=b).**
- **After that, there is another ternary operator statement for finding the minimum value between a and b.**
- **The only difference here is that instead of assigning a value to min variable directly like in case of max variable we are checking whether 'a' or 'b' has smaller value.**
- **Then comes a while loop which runs as long as b>0.**
- **Inside this loop there are three statements: temp=a; assigns current value of 'a' to temporary variable called temp; then next line assigns current value of 'b' to 'a'; finally third line calculates remainder when dividing temp with b using modulus (%) operator.**
- **This process continues until we get remainder zero i.e., till HCF found out.**
- **Once outside this while loop we have our HCF stored in variable named "a".**
- **Now comes another while loop which runs until LCM calculated becomes divisible by smallest number among given**
- **The code attempts to find the highest common factor (HCF) and lowest common multiple (LCM) of two given numbers, 12 and 40, and print them out.**

Extra instructions used:

MAX M(X):

Takes the value in memory location M(X), compares it with the value in AC, and updates AC with the greatest of the two values

MIN M(X):

Takes the value in memory location M(X), compares it with the value in AC, and updates AC with the least of the two values

LTHAN0 M(X):

**Takes the value in memory location M(X),
if the value is less than or equal to 0, AC value is made 1, if not, AC value is made -1**

EQO M(X):

**Takes the value in memory location M(X),
if the value is equal to 0, AC value is made 1, if not, AC value is
made -1**

MULT M(X):

**Takes the value in memory location M(X), multiplies it with the
value of AC, and stores the result in AC**

INPUT:

**Takes an input from the user and updates AC with the input
value**

STOP:

**when both right and left instruction are given as STOP, the
program counter ends there**

Enter a number : 12

Enter a number : 40

HCF = 4

LCM = 120