Computer Architecture

Lesson_03 The Machine Instruction Cycle

Lesson Title: The Machine instruction cycle.

IB Syllabus Alignment: Lesson 2.1.4 Explain the machine instruction cycle

SWBAT/IB Teaching Standard for Assessment: This should include the role of data bus and address bus

Do Now / Coding Component (2 minutes) *Students will share their sample code based on yesterday's demo on Fortran code (reprinted here)*

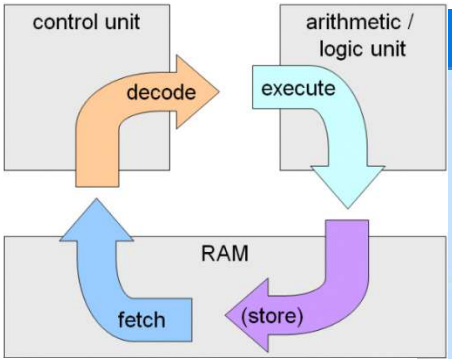
```
    IF ( L ) THEN
          N=N+1
          CALL
CALC
      ELSE
          K=K+1
          CALL
DISP
      END IF
```

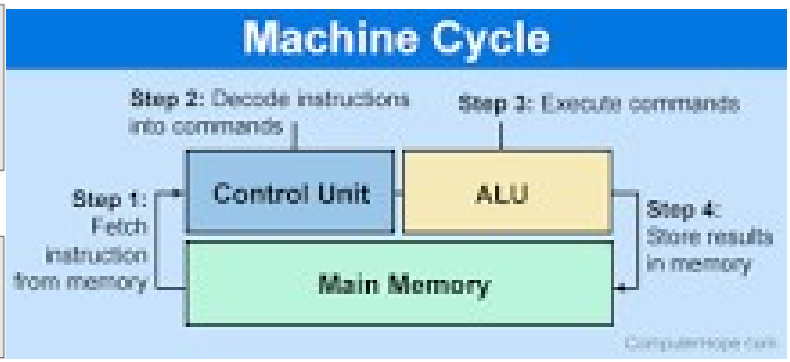
```
 IF ( C .EQ. 'a' ) THEN
          NA=NA+1
          CALL APPEND
     ELSE IF ( C .EQ. 'b' )
THEN
          NB=NB+1
          CALL BEFORE
     ELSE IF ( C .EQ. 'c' )
THEN
          NC=NC+1
          CALL CENTER
     END IF
```

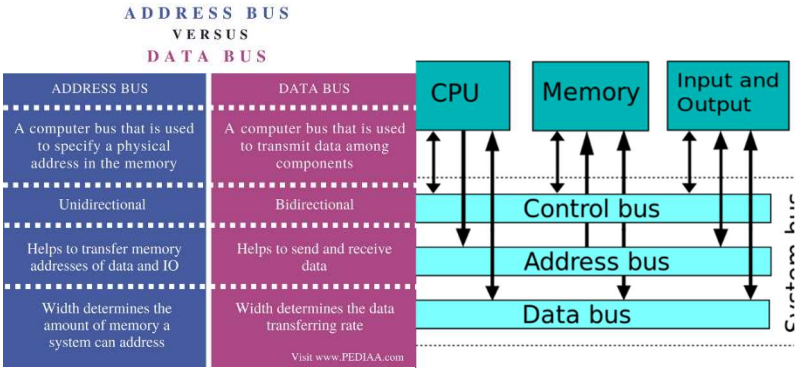
```
 IF ( PRESSURE .GT 1000.0 ) THEN
          IF ( N .LT. 0.0 ) THEN
               X = 0.0
               Y = 0.0
          ELSE
               Z = 0.0
          END IF
     ELSE IF ( TEMPERATURE .GT. 547.0
) THEN
          Z = 1.0
     ELSE
          X = 1.0
          Y = 1.0
     END IF
```

Part A. Introducing the Lesson *(5 minutes)* *Show these images and ask students what are the major advantages and disadvantages of each:*

Part B. Student Centered Activity. *(20 minutes)*







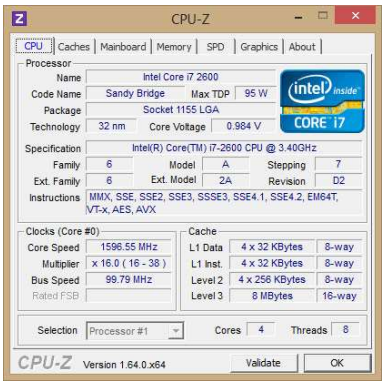
Task: Annotate the diagrams above based on your best understanding of the information provided.

Research/Reading Task Topic: Machine Cyle Reading
https://runestone.academy/ns/books/published/welcomecs/ComputerArchitecture/MachineCycle.html

Task: Why is the term "Bus" used in CS? Search the origin of this term.

Task: Research about Data Bus and Address Bus, then prepare a 5 minute presentation to explain the main differences and similarities. Include the reason for having 2 different types of bus.

Task: Compare the Intel 8085 and 8086/8088 processors in the context of the bus. Then compare both to the current Intel i7 and the Apple M.



Part C. Whole Group Lesson Component /Harkness Protocol *(15 minutes)*

The class will attempt to interpret this diagram:

Students will download the freeware CPU-Z and use it on their computer.