

Computer Science
Programmatic Assessment

Term: Fall 2023

CS Program PLO # 4: “Students will have a fundamental understanding of computer systems.”

Course: CS 266 Comp Organization & Assembly Language (required for all CS majors)

Assessment Question

Name and describe the four major components of the Von Neumann Architecture.

Rubric:

PLO #4	Fall 2023
3—ADVANCED	Students are able to name and correctly describe the four major components of the Von Neumann architecture.
2—COMPETENT	Students are able to name the components of the Von Neumann Architecture, but have errors such as indicating the CPU as a component when this unit is actually a combination of the Arithmetic Logic Unit (ALU) and the Control Unit (CU).
1—BEGINNING	The student is able to indicate something about computer architecture, but the answer does not cover the components of the Von Neumann Architecture. Only names of components appear in answer.
0 – Incomplete	The question was left blank.

Assessment	Reader 1	Reader 2	Average
Student 1	3 – Very Thorough Description	3 - Thorough & Accurate	3
Student 2	2 – Some issues w/ALU and CU descriptions	2 - Some incomplete Descriptions	2
Student 3	2 – Has components. Described all as CPU. Hard to read due to be taken and scanned at Palamanui.	3 - Each component is listed with a basically accurate description	2.5
Student 4	3 – Succinct. Also described fetch, decode, execute for CU	3 - Components are listed with accurate descriptions.	3
Student 5	2 – OK, but indicates CU’s only job is to tell ALU what to do	2 - Listed correct components but ALU & CU descriptions are inaccurate	2

Student 6	3 – Good description of Control Unit	3 - Accurate & Complete	3
Student 7	2 – Input does more than take in commands from user	2 - Correct components but incomplete descriptions	2
Student 8	2 – Good, but control unit is more than register data and information	2 - some inaccurate information in descriptions	2
Student 9	1 – Seems to be a collection of facts on architecture, but covers some of the points	1 - incorrect components listed	1
Student 10	3 – Great answer and covers fetch, decode, execute cycle	2 - ALU description is incorrect	2.5
Student 11	2 – Nice succinct answer. ALU does more than comparison	3 - Generally correct descriptions	2.5
Student 12	1 – Named two hardware components (CPU & RAM)	1 - missing 2 components; 2 inaccurate component names; no descriptions	1
Student 13	3 – Excellent & Detailed answer	3 - good thorough answer	3
Student 14	1 – Only the names of the components appear in the answer	1 - components were listed but descriptions were missing	1
Student 15	2 – Confuses the ALU and CU functions to a small extent	2 - some inaccurate descriptions	2
Student 16	3 – I like that they mention the stored program concept	3 - generally accurate descriptions	3
Student 17	2 – Could better describe the functions of memory	1 - overly vague descriptions	1.5
Student 18	2 – Names 4 components, but slight errors in the description	2 - some descriptions are only partially correct	2
			Reader agreement - 14/18 (78%)

Observations: Students were generally able to correctly name the components of the Von Neumann architecture. Some of the descriptions of the components contained slight errors in terms of what functions the components performed. The two readers were in general agreement in their assessment, and when they differed, the differences were slight.

Recommendations to improve student performance: Include an assignment that has students step through all of the tasks involved in running a machine language program in the Von Neumann architecture so that the functions of these components are made clearer.