Suppose that below (Part 2) will represent a snapshot of our data segment and that each box in memory dump indicates a single byte. The starting address of the first byte is 0x00020170 in hex. Suppose further that the data identifiers are as described below.

Part 1 (2 pts): Finish writing out the memory address for each label below. The first label ‘szMsg’ has been completed for you.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | .data |  |
| **0x00020170** | szMsg: | .asciz | “Factorial” |
| 0x0002017A | cCr: | .byte | 10 |
| 0x0002017B | sValArr: | .hword | -1,-2 |
| 0x0002017F | iValArr: | .word | 0,0,0 |
| 0x0002018B | bValArr: | .byte | 1,2,3,4 |

Part 2 (4 pts, 1 pt for each row, no partial credit): Here is the actual data segment. Fill in the memory addresses and contents below based on the data values in Part 1. ALL VALUES MUST BE WRITTEN IN HEX AND HOW THEY ACTUALLY APPEAR IN MEMORY! Capital ‘A’ is hex: 0x41 and lower case ‘a’ is 0x61.

**MEMORY DUMP**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **0x00020170** | 0x46 | 0x61 | 0x63 | 0x74 | 0x6F | 0x72 | 0x69 | 0x61 |
| 0x00020178 | 0x6C | 0x00 | 0x0A | 0xFF | 0xFF | 0xFE | 0xFF | 0x00 |
| 0x00020180 | 0x00 | 0x00 | 0x00 | 0x00 | 0x00 | 0x00 | 0x00 | 0x00 |
| 0x00020188 | 0x00 | 0x00 | 0x00 | 0x01 | 0x02 | 0x03 | 0x04 |  |

Part 3: (3 pts) Now the contents of storage have changed to reflect the results of execution of code by a program to be the following…complete the row address values.

**MEMORY DUMP**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **0x00020170** | 0x4a | 0x4f | 0x4b | 0x45 | 0x52 | 0x00 | 0x69 | 0x61 |
| 0x00020178 | 0x6c | 0x00 | 0x0a | 0xff | 0x00 | 0xf8 | 0xff | 0xff |
| 0x00020180 | 0xff | 0xff | 0xff | 0x08 | 0x08 | 0x00 | 0x00 | 0x63 |
| 0x00020188 | 0x00 | 0x00 | 0x00 | 0x70 | 0x69 | 0x65 | 0x00 |  |

Based on your work in Parts 1-3, answer the following questions (4 pts each)

1. What are the hex values that are now stored in szMsg? 4a 4f 4b 45 52 00 69 61 6c 00
2. What is the hex value of sValArr[0] in big endian? 0x00FF
3. What is the hex value of iValArr[1] in big endian? 0x00000808
4. What is the hex value of bValArr[2]? 0x65