Activity 2-1 : Central Processing Unit

Group No : G-27

Group Member :

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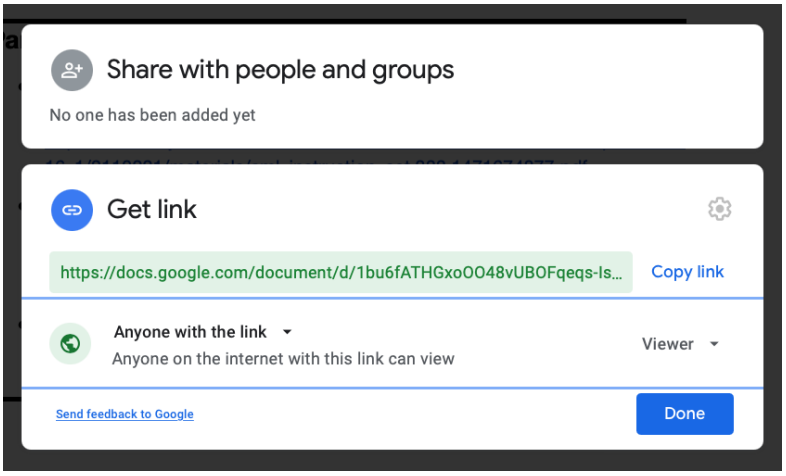
Part 0 : Preparation

- In part 1, use Activity 2 Reference: SML Instruction Set, which can be downloaded from CourseVille or below: https://www.mycourseville.com/sites/all/modules/courseville/files/uploads/2016_1/2110221/materials/sml_instruction_set.333.1471674877.pdf
- In part 2 and 3, Use Brookshear Simple Machine Emulator to perform the indicated tasks https://www.mycourseville.com/sites/all/modules/courseville/files/uploads/2016_1/2110221/materials/bme.333.1471675276.htm
- Make a copy of this sheet. Answer the questions in the box given. Share this file with the permission for **anyone with link can view the document**. Submit the URL of this file to CourseVille.



Part 1 : SML Instruction (20 minutes)

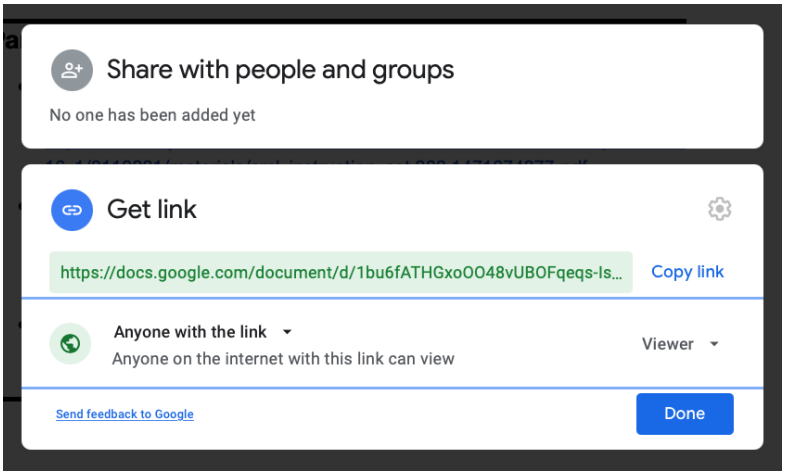
Program-A

Suppose a CPU is started with PC=10 and the following values in cells 10-19 in memory.

Address	Content
10	22
11	36
12	25
13	0F
14	83
15	25
16	33
17	20
18	C0
19	00

Question A.1 Decode the following instruction into English

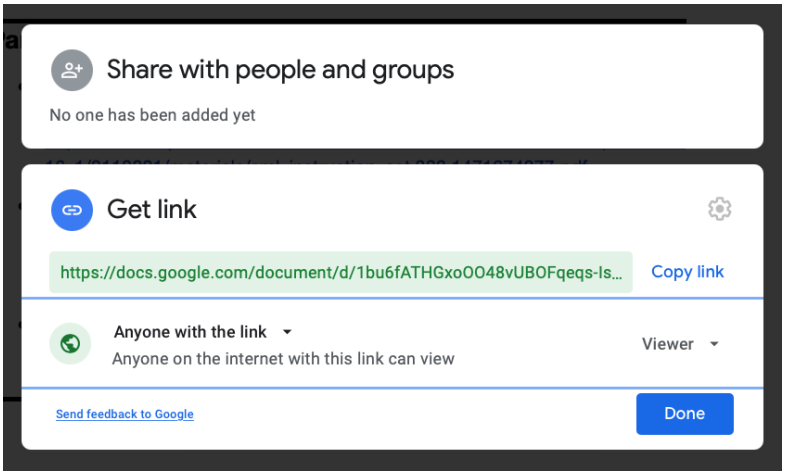
2236	Load register 2 with bit pattern 36
250F	Load register 5 with bit pattern 0F
8325	AND the bit patterns in registers 2 and 5 and place the result in register 3.
3320	STORE the bit pattern found in register 3 in the memory cell whose address is 20



C000	HALT execution

Question A.2 What does this program perform?

36 AND 0F and store the result in the memory cell 20



Program-B

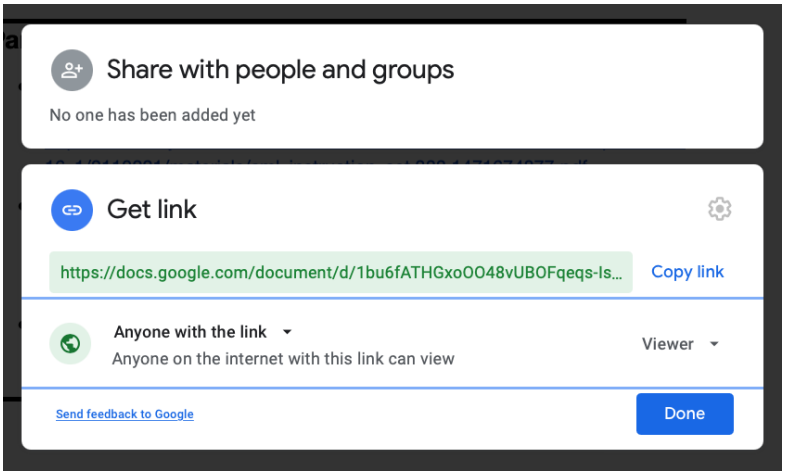
Suppose a CPU is started with PC=20 and the following values in cells 10-19 in memory.

Address	Content
20	11
21	30
22	20
23	05
24	B1
25	2A
26	22
27	00
28	B0
29	2C

Address	Content
2A	22
2B	01
2C	32
2D	31
2E	C0
2F	00
30	04
31	FF

Question B.1 Decode the following instruction into English

1130	Load register 1 with the bit pattern of memory cell 30 (04)
2005	Load register 0 with bit pattern 05
B12A	Jump to instruction 2A if bit pattern of register 1 is the same as register 0(In this case, they are not the same so the program continues as normal)
2200	LOAD the register 2 with the bit pattern 00
B02C	JUMP to the instruction located in the memory cell at address 2C if the bit pattern in register 0 is equal to the



	ff bit pattern in register number 0. Otherwise, continue with the nor
2201	LOAD the register 2 with the bit pattern 01
3231	STORE the bit pattern found in register 2 in the memory cell whose address is 31
C000	HALT execution

Question B.2 What does this program perform?

Compare bit pattern in memory cell 30 (04) with bit pattern 05:
-If they are the same, load register 2 with 01, then store it in address 31
-If they are not, load register 2 with 00, then store it in address 31