**Requirement:**

1. Implement the HALT, TRAP, IN, OUT, CHK instruction.
2. Add a printer and a keyboard to the panel.

**Design and Implementation:**

HALT:

Stop the machine.

TRAP:

When the Trap instruction occurs, the processor saves the current PC and MSR contents to the memory, then fetch the address from location 0 into PC which becomes the next instruction to executed.

IN:

Input character to register from device.

OUT

Output character to device from register.

CHK

Check device status to register.

ASCII converter:

The converter takes the input from the file and converts the input into binary string.

1. deal with the string format
2. convert the string to binary

three cases:

Printer:

Printer prints every operations and result on the screen.

Keyboard:

Get input from users.

**Result:**