Name:

Teacher:

Class:

Date:

Logic Gate Applications - Practice Problems Set 4
逻辑门运用-练习题4:

1. An electronics company has designed the following control system for an automatic washing machine. The design includes 3 different switches: a _Power Switch_ that can be turned **ON (1)** or **OFF (0)**, a _Door Switch_ that can be **CLOSED (1)** or **OPEN (0)**, and a _Water Level Switch_ that can indicate that the tank is **FULL (1)** or **EMPTY (0)**.
    某电子公司为自动洗衣机设计了以下控制系统。该设计包括3个不同的开关：可打开（1）或关闭（0）的电源开关，可关闭（1）或打开（0）的门开关，以及可指示水箱已满（1）或已空（0）的水位开关。
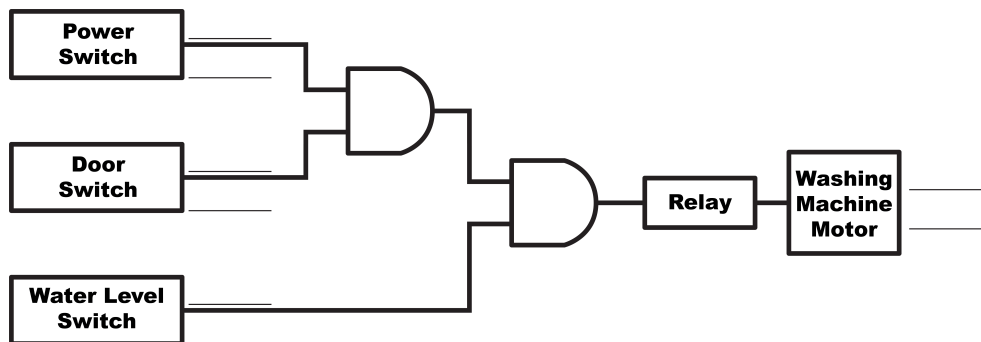
a) Label the diagram with the logical states at each point in the circuit.
    用电路中每个点的逻辑状态标记图表。

b) What logic gates are used to create the microcontroller in this circuit?
    在这个电路中，使用的什么逻辑门来创建微控制器?
    _____

c) Complete the truth table for this circuit.完成此电路的真值表。

Power	Door	Water Level	Machine Motor
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

d) Under what conditions will stop the washing machine from working?
在什么情况下洗衣机会停止工作?

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2. The company wants to design a second control circuit for their automatic washing machine. This second circuit will be used to control a built in heater. The company's concept is to have two different settings that the operator can select from. First setting would allow the heater to be used to heat the water in the washing machine during a wash cycle if the operator is planing to wash whites or linens. The second setting would allow the operator to set the machine to dry or warm cloths without having to washing them.
该公司想为他们的自动洗衣机设计第二个控制电路，将用于控制内置加热器，旨在让操作员可以从两种不同的设置中进行选择。如果操作员打算清洗白衣服或亚麻布，则第一个设置允许在清洗周期内使用加热器加热洗衣机中的水。第二个设置将允许操作员将机器设置为干燥或加热衣物，而无需清洗衣物。

The new circuit would use the following switches: Power Switch, Door Switch, Water Level Switch, and a new switch named Heater.
新电路将使用以下开关：电源开关、门开关、水位开关和一个加热器的新开关。

The heater will turn **ON** if the washing machine door is **CLOSED**, there is water in the tank, and the heater switch is turned **ON**, __OR__ if the door is **CLOSED** and the heater switch is turned **ON**.
如果洗衣机门关闭、水箱中有水且加热器开关打开，或者如果门关闭且加热器开关打开，加热器将打开。

Draw the circuit here: