Prototype Proposal

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As a project that sets out to recreate a water fountain, the design requires a series of pumps to jettison water at varying heights.

As such, the prototype will be to take one of the pumps and demonstrate control over it using PWM from the Discovery board microcontroller. It will consist of a pump and the Discovery board connected to a breadboard, which is connected to a source of (minimum) 3V and ground. Various other electrical parts, such as two 1k Ohm resistors, will also be a part of the circuit.

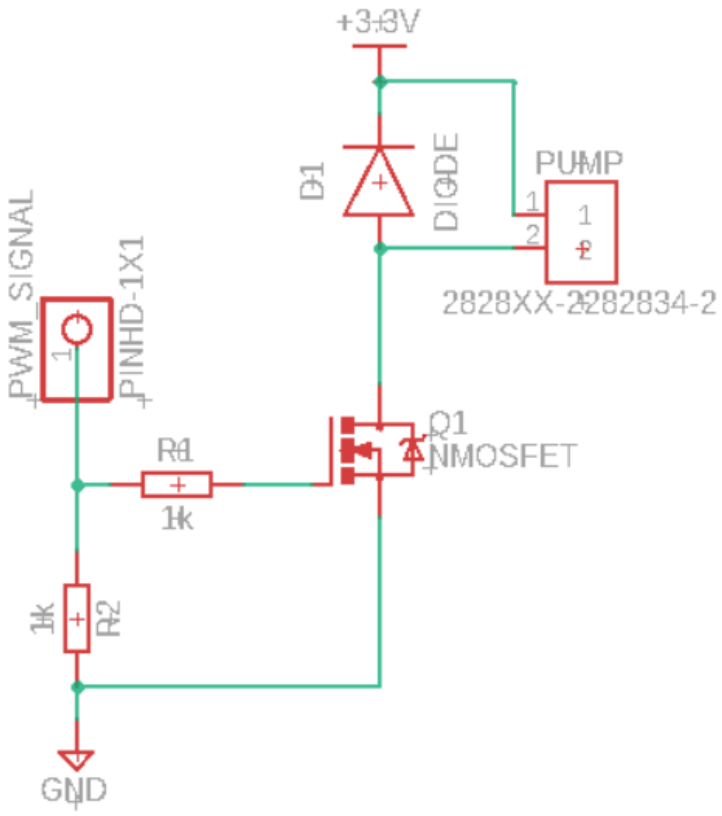

Figure 1 - Circuit schematic of the prototype.

At the same time, the pump will be submerged underwater not only to demonstrate it works, but to prolong the life of the unit.

Model	Voltage Scope(DC)	Current(A)	Power(W)	Max Water Head(M)	Max Flow Rate(L/H)	Starting Voltage	waterproofing grade
JT-DC3W-3	3V	0.12	0.36	0.35	80	1	IP68
JT-DC3W-4.5	4.5V	0.18	0.91	0.55	100	1	IP68

Figure 2 - Data given by Amazon on the pumps.

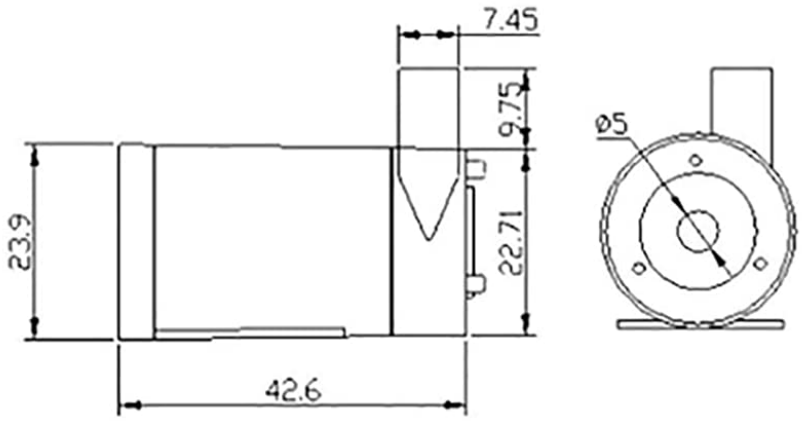

Figure 3 - Pump dimensions.

The goal of the demonstration is to show how changing the voltage to the pump creates differing heights of water. The varying voltage is to be controlled by the PWM with the input given by a potentiometer. The higher the potentiometer, the shorter the water height and vice versa.

Once it’s determined that the height of the water can be controlled by the PWN, the next step would be to create an FFT to supply the input instead of the potentiometer. At the same time, that PWM controls the brightness of the LEDs to surround pumps. Figuring out one side will facilitate the implementation of the other and seeing as the pumps will be the main feature of the project, it was decided to work with them first.

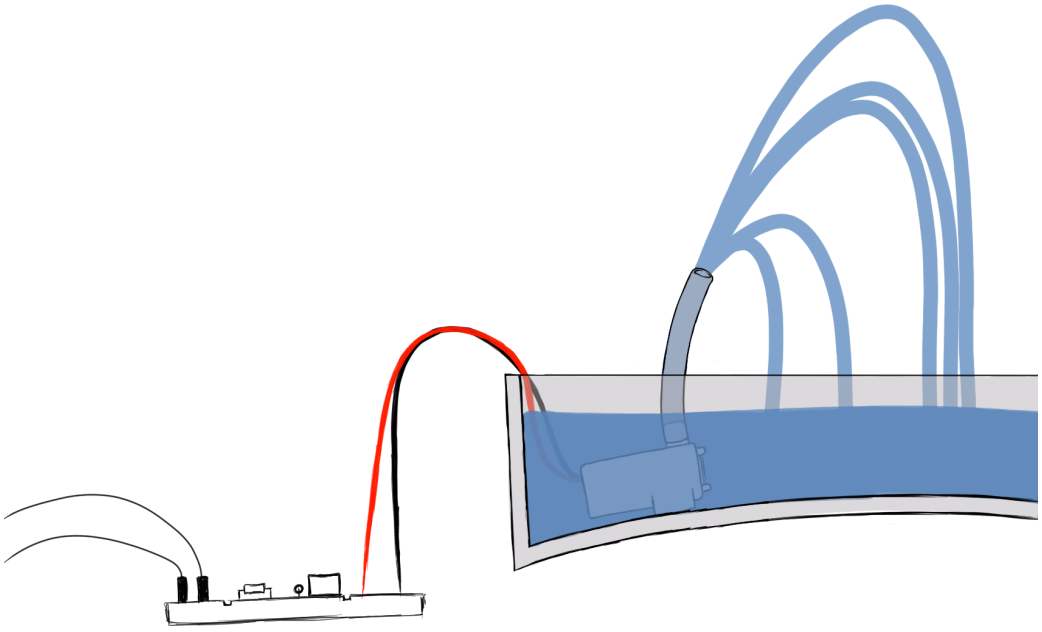

Figure 4 - Rough sketch of prototype demonstration.