

ABSTRACT

Dynamic programming is a method of problem solving by describing solutions into a smaller steps, so that the final solution is a whole of these stages. Based on that, a research entitled "Scheduling of Electrical Devices Use in 2 Level House Using Dynamic Programming Algorithm" in order to limit the cost of electricity.

The purpose of this research is to apply dynamic programming algorithms to make automation of the use of electrical devices in a building prototype. Dynamic programming algorithm is placed on the Firebase cloud that is connected to a database so that it can be accessed anywhere and uses a microcontroller as a device controller.

In this research a system is designed where dynamic programming algorithms are used to control the electrical energy use of electronic devices in a 2-level home prototype, by managing the electrical energy used based on the maximum user-defined electricity costs, so that electricity usage can be optimized without exceeding the specified costs.

From the results of the research showed the use of dynamic programming methods can be applied to provide optimal solutions for the use of electrical devices. Device usage time can be limited and energy usage is reduced by 78.24% which is affected by current, voltage and value or priority factors of each device where the higher the priority value, the electrical device's schedule to light up is longer. Dynamic programming algorithm cannot work if the quota in the firebase function cloud has reached the limit. Automation on this 2 level home prototype can be a solution and can be applied to limit the cost of electricity each month according to the user's wishes.

Keywords: *dynamic programming algorithm, automation, firebase, microcontroller, cloud.*