*Simulation of Electrical Switch*

Design a C program to simulate the operation of an electrical switch where the program takes input value either 0 or 1. Representing the switch be off or on respectively.

Using a suitable conditional statement the program should intrepret the input values and display the corresponding condition as on or off. Additionally the program should handle invalid input value and provide appropreiate messages.

* **RESEARCH -**

1. **Embedded Dam Control System -**

*It consists of a set of sensors connected to a DC motor through an 8-bit microcontroller.*

*Water level is detected and depending on water level gates of the dam can be controlled using a DC motor and a personal computer.*

*By using this wastage of water is reduced and efficient utilization of water resources is happening.*

*With the help of the VDU system (visual Display Unit ),this system is built.*

*This also deals with real time calculation of upstream and downstream flow of water in dams. Recently the system has been upgraded with a PLC system. BASCOM-8051 software is used for writing code in C programs. In this system when water level is assumed as 4ft or more then dam gates open & decrement in water level leads the controller to close the gates.*

[*https://www.researchgate.net/publication/329673587\_Embedded\_Dam\_Gate\_Control\_System\_using\_'C'\_and\_Visual\_Basic*](https://www.researchgate.net/publication/329673587_Embedded_Dam_Gate_Control_System_using_'C'_and_Visual_Basic)

**2. BIoT Smart Switch -**

*Smart Switch are responsible for lighting system physical control in a building based on commands by the user communicating by a smart switchboard.*

*With the rise in development of simulation switches systems and solar powered street lighting systems, an increase in smart switches is also a matter. This module relies on standard wired or wireless communication protocol.*

[*https://www.mdpi.com/2075-5309/14/10/3076*](https://www.mdpi.com/2075-5309/14/10/3076)

* **METHODOLOGY -**

Aim : To simulate a system that detects vehicles moving in the wrong direction, captures essential information, and alerts the traffic police.

*The program asks the user to input the direction of the vehicle.*

* *1 = vehicle moving in correct direction*
* *0 = vehicle moving in wrong direction*
* *If the user inputs anything else except 1 & 0 , the program will display an error.*

*After the input from the user, the program uses a conditional statement (if-else).*

* *If input is 1 then the program will display “ Vehicle moving correctly. No action required.”*
* *If input is 0 then it will display “Alert! Wrong-way vehicle detected.”*

*If a vehicle is detected then the user needs to enter the number plate and location. Then the program displays the information and forwards it to the traffic police department.*

*In the future, we can extend this by connecting to cameras and automatically detect the wrong- way vehicles. Also we can use cameras which capture the photo of the number plate, if any vehicle is moving fastly. And send the info directly to traffic police . Else directly message to the victim for the fine.*

*We can use this for capturing the speed of the vehicle, if any is overspeeding.*

* **IDEATION -**

*The idea of this project came from the common problem of wrong-way driving, which often leads to accidents on the road. For thinking about a simulation of the switch(1 & 0) project, I thought this can work for this project.*

*I wanted a real-life application for this project. This project takes input of vehicle direction and then decides if it is violating the rules or not. If that person violates then information of the vehicle goes to the traffic control department. This project is easy to demonstrate using the c program and also allows use of the conditional statement.*

*ALGORITHM :-*

*STEP 1 : START*

*STEP 2 : Input the direction of the vehicle.*

*1 = using correct way*

*2 = using wrong way*

*Other than 1 or 0, display an error message or ask again.*

*STEP 3 : if 0 = “Alert !!! wrong way vehicle detected.”*

*STEP 4 : input the number plate and location.*

*STEP 5 : Print the information.*

*STEP 6 : else if 1 = “vehicle moving correctly.”*

*STEP 7 : Print “ Drive Safely.”*

*STEP 8 : STOP*

* **BUILD -**

#include <stdio.h>

int main() {

int direction;

char plate;

char location;

printf("=== Wrong-Way Vehicle Detection Simulator ===\n");

printf("Enter vehicle direction (1 = Correct, 0 = Wrong): ");

scanf("%d", &direction);

if (direction == 1) {

printf(" Vehicle moving in correct direction.\n");

}

else if (direction == 0) {

printf(" ALERT !!! Wrong-way vehicle detected! \n");

printf("Enter vehicle number plate (e.g., MH12AB1234): ");

scanf("%s", plate);

printf ("Enter the location where this happened:");

printf("\nCaptured Information:\n");

printf("Plate: %s\n", plate);

printf("Location: %s\n", location);

}

return 0;

}

* TEST -
* IMPLEMENT -