With in this project, the aim was to design and code a microcontroller system that would effectively comply with the four different switch inputs, each performing unique functions such as motor control, LED sequences and communication with the virtual terminal, the system was developed using embedded C and simulated using proteus.

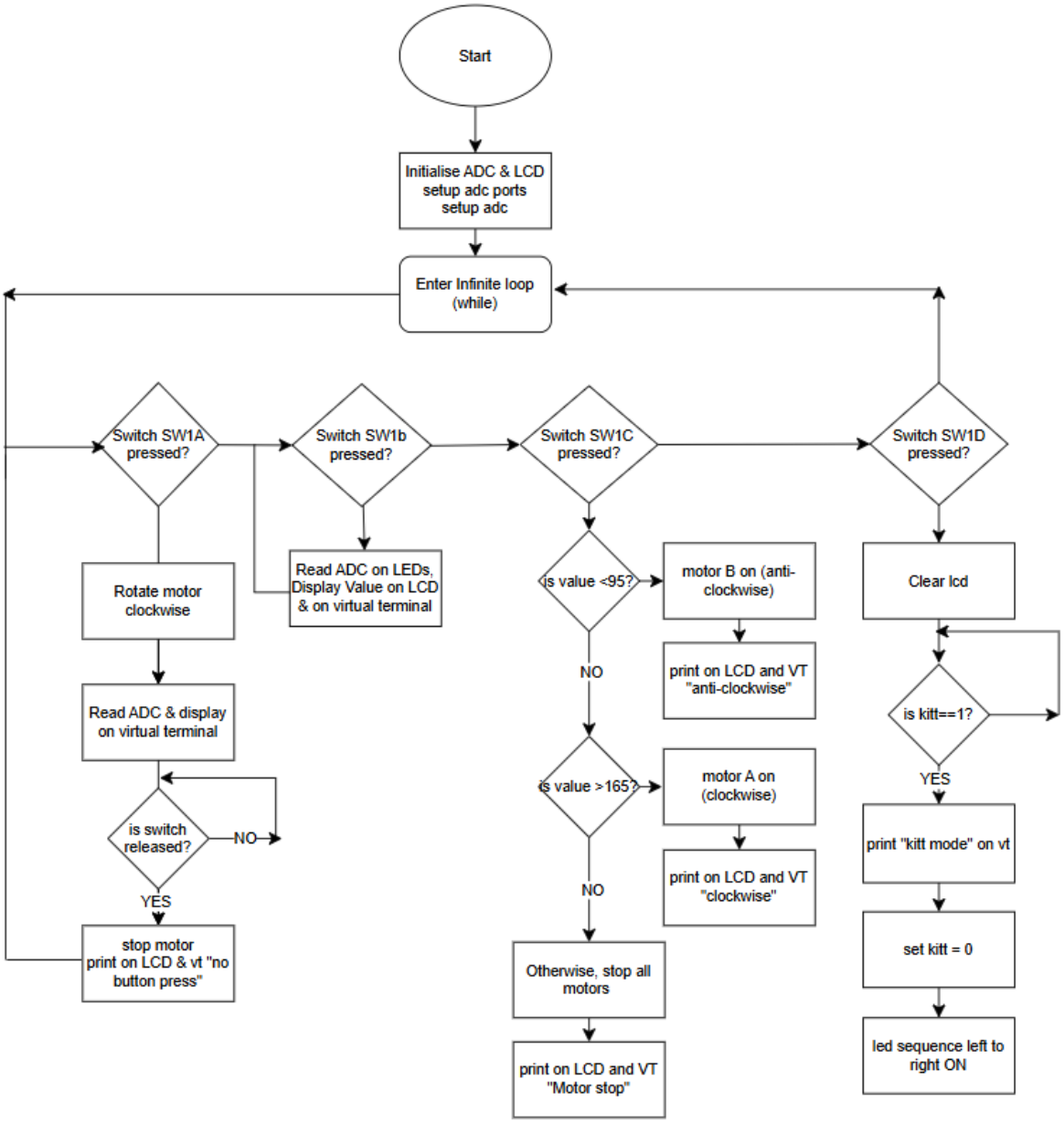
Each switch condition was implemented in its own function to improve code modularity and readability. In order to efficiently achieve this task functions such as conditional logic, masking, ADC setup and LCD functions were used to fulfil the requirements of this project.

LCD display: used to display information such as ADC values, motor status and messages “Kitt mode”

Input switch (SW1-A to SW1-D): switches are connected to PORTA and are used to select different modes of operation. Each switch triggers a specific function.

Pushbutton: allows for manual input to control motor A’s Rotation

Virtual terminal: Echos messages and data for monitoring and debugging purposes


Start
Initialise ADC & LCD
setup adc ports
setup adc
Enter Infinite loop
(while)
Switch SW1A
pressed?
Switch SW1b
pressed?
Switch SW1C
pressed?
Switch SW1D
pressed?
Rotate motor
clockwise
Read ADC on LEDs,
Display Value on LCD
& on virtual terminal
Read ADC & display
on virtual terminal
is switch
released?
NO
YES
stop motor
print on LCD & vt "no
button press"
is value <95?
motor B on (anti-
clockwise)
print on LCD and VT
"anti-clockwise"
NO
is value >165?
motor A on
(clockwise)
print on LCD and VT
"clockwise"
NO
Otherwise, stop all
motors
print on LCD and VT
"Motor stop"
Clear lcd
is kitt==1?
YES
print "kitt mode" on vt
set kitt = 0
led sequence left to
right ON