COMP8049 – Embedded Systems Engineering Project – Part A

Completion Date: 4th November 2024

Value: 25 marks

Question 1

a) Give a brief overview of how the editor in question 2 will work using the *kputc* function and the *lines* array.
b) Explain how you would modify the code to handle (you cannot just use a huge array and you don't have the malloc function as there is no heap):
i) long lines
ii) scrolling left and right with long lines.
iii)handle long files e.g. 1000 lines long.

You do not have to provide code.

(6 marks)

Question 2

Simple editor program for the emulated versatilepb board. You may use the supplied sample code in your editor. The supplied code is not optimised to aid usability e.g. it re-displays the whole editor window on a key press.

You will need to implement at least the following in your editor :-

a). left, right and down arrow keys (up arrow is 'done'). You can determine the appropriate escape sequence by using the 2.6 example and printing out the key stroke values.

b). backspace and delete.

c). delete a line e.g. ctrl -d.

d) insert mode – currently key strokes overwrite the previous character. Need to avoid pushing characters over the edge of the screen.

e). copy a line and insert the line in a new location

(15 marks)

Question 3

What is the esp8266 WiFi module? Give an overview of the IoT and smart home devices based on the esp8266 WiFi module. Refer to firmware for such devices e.g. tasmota, esphome, mongoose OS in your answer.

See here for some examples:

https://esphome.io/guides/diy.html.

https://www.itead.cc/smart-home.html

https://www.shelly.si/en/wifi-relays/1-shelly-1-wifi-relay-switch-3800235262009.html

https://esphome.io/

https://www.home-assistant.io/

https://tasmota.github.io/docs/About/

https://mongoose-os.com/

https://github.com/cesanta/mongoose-os-smart-light

https://lwn.net/Articles/822516/

(4 marks)