Lab05　2017/12/21

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PURPOSE

This lab is aimed at improving our understanding of the principle of interrupt-driven io and the usage of stack and intterrupt vector.

To some degree, it's important and different to get gripe of the principle and write the programm buglessly.

PRINCEPLE

stack

It is a kind of data structure that allow it's elements last in, first out. Because of this characteritics, it is widely used in many situations. In this lab, it is used to store the origin programm's info such as the PSR and PC in superuser stack.

interrupt-driven io

It's more efficient than polling, because it needn't to examine the KBSR every instruction cycle. The cpu just execute the instructions until the interrupt occurs. After compare the priority of tasks, it deals with the io. After that, the cpu will continue to execute the origin programm, seeming nothing happened.

interrupt service subroutine

It is a subroutine that handle the interrupt situation. It is somewhat identitical to the trap routinues and trap vectors. In this lab, we should write a subroutine to judge if the keyboard input is a number.

PROCEDURE

1. Firstly, I learnd related rules. It's the key step of this lab 😃
2. THen I write the interrupt service routine. THough we can't use the trap vector to output a string, it is just a piece of cake .
3. As for the user_programm, I set the stack point namely R6 as val x3000, then I set the IE bit of the KBSR as 1 by using MASK x4000. Then I use the instruction STI R0, INKB to set the interrupt entry x0180 : x1500
4. Last, I write a endless loop for outputing the str CS@USTC CS@USTC CS@USTC CS@USTC CS@USTC CS@USTC
5. NOTICE: Because of the high speed of outputing, It is hard to see the output of the interrupt service

routine. When I running this programm, I set a breakpoint at the last instruction of the interrupt sercice routinue, which location is x151e.

RESULT

input a num

input a non-number

SUMMARY

Through this lab, I have a deep understanding the stack and interrupt-driven io. I am exemely happy to learn such knowledge which is useful and intersting.

Thanks for the studying guide of Mrs An and teaching assistants.

Merry Christmas