Research on Curriculum Reform "SCM Application Technology" project-based teaching

Zimin Wang[1] ， Baiqing He[2]

Nanchang institute of technology，Nanchang330044, China;

86035262@qq.com，308809980@ qq. com.

Key words: Curriculum reform; projectized; SCM

Abstract: In order to train technical personnel to adapt to the application of the social economy, Nanchang Institute of Technology and the engineering teaching philosophy and the existing existing training program together.On the "SCM Application Technology" curriculum reform precise, clear teaching objectives of the course, to promote the teaching practice, from theory to practice, from practice to the project, step by step to enhance and expand the teaching content, teaching reform program to enhance students' professional qualities.

One of "SCM Application Technology" Reform of key project is based lesson plans teaching reform.The so-called lesson plans that teachers preaching Tuition basis.Over the years, the teaching profession is theory-based, confirmatory experimental supplement.The Nanchang Institute of Technology saw the drawbacks of this teaching method, drastic reform, the first ax is Kanxiang teacher lesson plans.Former teacher lesson plans are great article introduces theoretical knowledge, and later Electronic and Information Engineering teaching team started studying how to improve students 'practical ability, after discussion agreed that, to improve students' practical ability, we must let students usual course of study often have the opportunity to do it.So now the lesson plan is no longer in the book exactly the theoretical knowledge, but includes a hands-on practical circuit design.

For example: practice teaching requires the production of "multi-switch indicates state" circuit.Lesson plans to introduce the electronic component through concrete strength functions and software programming methods, are briefly as follows:

Experimental task

As shown in FIG, AT89S51 MCU P1.0-P1.3 connected four light emitting diodes L1-L4, P1.4-P1.7 took four switches K1-K4, programmed to switch the state of the reflected light-emitting diodes .(The switch is closed, the corresponding lights switch off, the corresponding light off).

Total circuit diagram
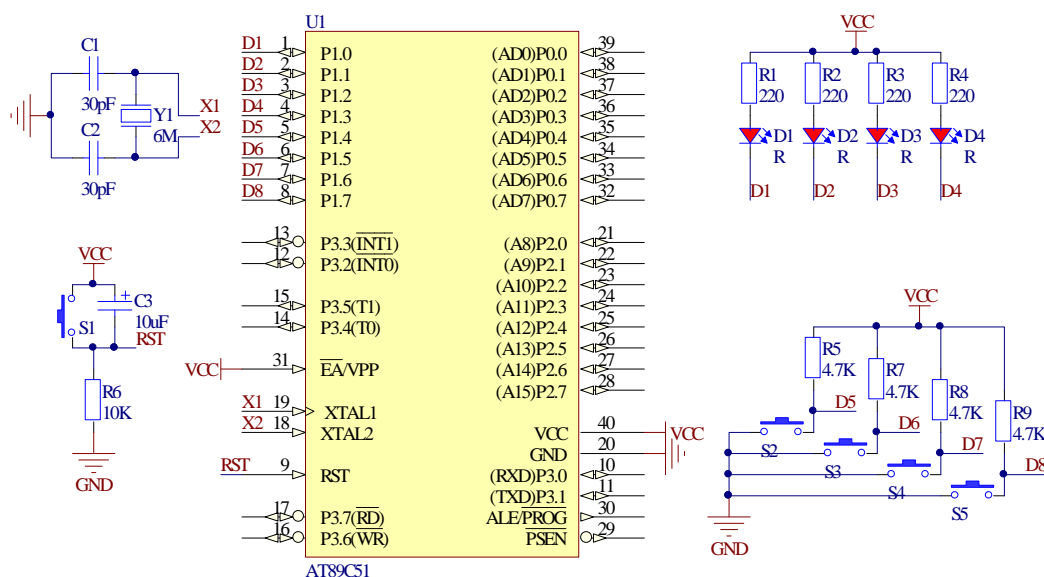
3, Each part of the circuit described

(1) Crystal oscillator circuit
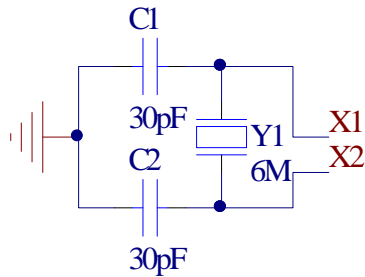
Microcontrollers have a crystal, crystal effect in the SCM system is very large, so that the design can not also a lack of natural crystal oscillator circuit design.It can be electrically equivalent to a capacitor and a resistor in series with a capacitor connected in parallel and then two-terminal network, the network has two electrical engineering this resonance point at a frequency of high and low points where the series resonant frequency of the lower and higher the parallel resonant frequency.Because crystals own characteristics resulting from this two frequencies quite close, within this very narrow frequency range, the crystal is equivalent to an inductor, so long as both ends of the crystal parallel capacitance on the right it will be composed of a parallel resonant circuit .The parallel resonant circuit is applied to a negative feedback circuit can constitute a sine wave oscillator circuit, which is the crystal oscillator circuit.

MCU read and write operations at the same time need to consume some time in MCU oscillator frequency and speed to run the program related.Crystal is to provide work to the microcontroller signal pulse, the pulse is MCU operating speed, such as 12M crystal.MCU operating speed is 12M per second, and the concept of a computer as CPU. Of course, there is a single-chip operating frequency range, not too large, generally 24M not go up, or instability.For the sake of stability of the circuit, ATMEL company access only recommend ceramic capacitor to ground two 10pf-50pf in two crystal pin to reduce the impact on the stability of the circuit-kai wave, so the distribution of the crystal oscillator capacitor 10pf between -50pf can be, there is no formula.

(2) Reset circuit
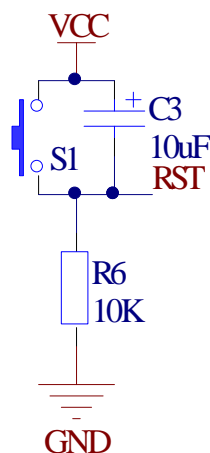
Reset circuit is a circuit used to return to the initial state of the circuit device, its operating principles and the computer has the same purpose, but the principles and means to start differently.Principle microcontroller reset circuit RST pin receives 2US above the level of the signal, as long as capacitor charging and discharging time is greater than 2US, can be reset, so that the capacitance value of the circuit can be changed.

SCM system in operation when they need to be reset, press the reset button inside the program automatically executed from the beginning.89 MCU reset signal is input from the RST pin to Schmitt trigger chip in the.Monolithic At reset, the port pin is in panic state, until the reset is complete, the system will be set to all-I port state.MCU reset circuit There are four main types, one type of differential, integral Second, Third comparison type, four is a watchdog type.Reset operation in two ways, the one power-on reset, the second is manual (switch) reset. When in power-on reset, power is instability, such that the system will not reset the program counter (PC) are not a suitable initial value, which will affect the normal operation of the CPU work.

(3) Key circuit
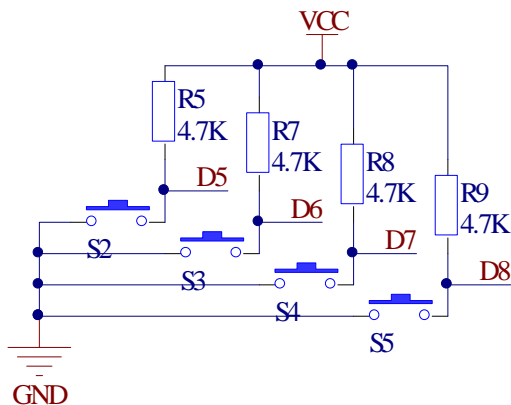
Plus a pull-up resistor, active low

(4) LED circuit
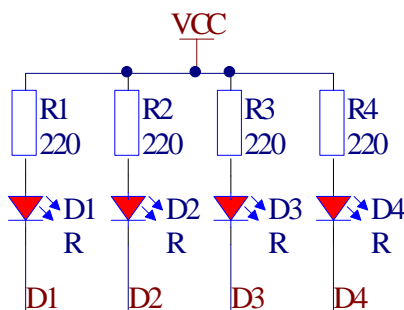
Active low, it can control the LED two buttons light off.

4. System board hardwired

(1) the "SCM system" area of P1.0-P1.3 with a wire connected to the L1-L4 port "Eight LEDs indicating the module "area;

(2) the "SCM system" area of P1.4-P1.7 with a wire connected to the "four-way toggle switch" area K1-K4 port;

Programming content

(1) State detection switch

For switch status detection, the relative microcontroller, is the relationship between the input, we can state polling of each switch, depending on the state of each switch so that the corresponding LED indication, you can use JB P1.X, REL or JNB P1.X, REL instructions to complete; and to be a one-time detection of four digital state, and then allowed to instructions, you can use MOV a, P1 command once the P1 port status reads all, and then take the high 4 bits to indicate status.

(2) Output Control

According to state of the switch, a light emitting diode L1-L4 to indicate that we can use SETB

P1.X CLR P1.X instructions to complete and can also be used MOV P1, # 1111XXXXB method once instructions.
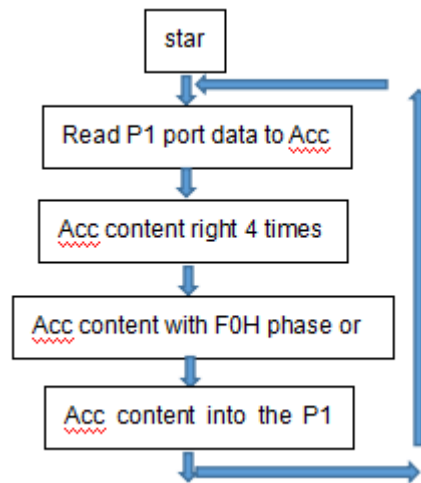
6. Block Diagram

Figure 2

With specific training programs to replace traditional theoretical lectures, so that students understand the principles of the use of each element in the hands, and raise awareness of electronic components.And through specific practices, through different ways to write a program, tighter integration project, to complete the practice of teaching.

Based on the curriculum reform project teaching of "SCM Application Technology" it is to determine the teaching plan microcontroller course covers every semester courses, hours and credits, including lessons and content of Practice Course.But the most important thing for the reform of teaching practice in this regard: to determine the appropriate open training programs.Now let the students themselves to literature, to design the composition of the project, to verify the feasibility of the project, and finally make real electronic products.Through training programs to stimulate students' imagination and exploration of self-learning ability.

References

[1] Zhang Lihua. Based on the characteristics of Construction and Transportation Electronic and Information Engineering CDIO orbit [J]. Wuhan University (Natural Science Edition). 2012(S2)

[2] Liang Na, Sun Shaoping, Jin Yingxue, Guo Gang. Exploration and Practice enhance interest in Pharmacology Teaching Reform [J]. Heilongjiang education (Theory and Practice).2016(04)

This thesis topic is: Based on the research results of curriculum reform "SCM Application Technology" project teaching, the number of JXJG-15-25-8.