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| 佛山科学技术学院  实验报告  实验名称 实验4 定时器  实验项目 制作田径比赛电子计时器、篮球比赛电子计时器  专业班级 22物联网2班 姓名 学号  指导教师 罗平 成绩 日期 2024-04-17     1. 实验目的   1．学习80C51单片机定时器的使用和编程。  2．熟悉定时器中断处理程序的编程。  3. 掌握编写数据处理程序。  4．掌握具体的单片机嵌入式系统的软硬件设计方法。   1. 实验电路（元件清单）   1、实验电路原理图  IMG_256  2、元件清单   |  |  |  | | --- | --- | --- | | **元器件编号** | **元器件名称** | **说明** | | U1 | AT89C52.BUS | 总线型AT89C52单片机 | | S1-S5 | BUTTON | 开关 | | R1-R5 | RES | 电阻 | |  | 7SEG-BCD | BCD译码7段数码管显示器 |  1. 实验内容 2. 绘制原理图。      1. 编写程序。   （1）#include<reg52.h>  sbit startButton=P0^0;  sbit pauseButton=P0^1;  sbit resetButton=P0^2;  sbit exitButton=P0^3;  bit int0\_Mark;  unsigned char HEXtoBCD(unsigned char hex)  {  return((hex/10)\*16+(hex%10));  }  void main()  {  unsigned char uc10ms=0,uc1s=0,uc60s=0;  TMOD=0x01;  IE=0x82;  while(1)  {  uc10ms=0;uc1s=0;uc60s=0;  P1=HEXtoBCD(uc10ms);  P2=HEXtoBCD(uc1s);  P3=HEXtoBCD(uc60s);  while(startButton);  while(!startButton);  while(exitButton)  {  int0\_Mark=1;  TH0=0xDC;TL0=0x00;  TR0=1;  EA=1;  while(int0\_Mark);  EA=0;  TR0=0;    uc10ms++;    if(uc10ms==100){  uc10ms=0;uc1s++;  }  P1=HEXtoBCD(uc10ms);    if(uc1s==60){  uc1s=0;uc60s++;  }  P2=HEXtoBCD(uc1s);    if(uc60s==60){  uc60s=0;  }  P3=HEXtoBCD(uc60s);    if(!pauseButton)  {  while(pauseButton);  while(!pauseButton)  {  if(!pauseButton)  {  P1=HEXtoBCD(uc10ms);  P2=HEXtoBCD(uc1s);  P3=HEXtoBCD(uc60s);  }  if(exitButton==0)  {  exitButton=0;  break;  }  while(!pauseButton);  }  }  if(!resetButton)  {  uc10ms=0;  uc1s=0;  uc60s=0;  P1=HEXtoBCD(uc10ms);  P2=HEXtoBCD(uc1s);  P3=HEXtoBCD(uc60s);  }  }  }  }  void timer0() interrupt 1  {  EA=0;  int0\_Mark=0;  TR0=0;  TH0=0xDC;TL0=0x00;  TR0=1;  EA=1;  }  （2）  #include<reg52.h>  sbit startButton=P0^0;  sbit pauseButton=P0^1;  sbit resetButton=P0^2;  sbit exitButton=P0^3;  bit int0\_Mark;  unsigned char HEXtoBCD(unsigned char hex)  {  return((hex/10)\*16+(hex%10));  }  void main()  {  unsigned char uc10ms=0,uc1s=0,uc60s=0;  TMOD=0x01;  IE=0x82;  while(1)  {  uc10ms=0;uc1s=0;uc60s=12;  P1=HEXtoBCD(uc10ms);  P2=HEXtoBCD(uc1s);  P3=HEXtoBCD(uc60s);  while(startButton);  while(!startButton);  while(exitButton)  {  int0\_Mark=1;  TH0=0xDC;TL0=0x00;  TR0=1;  EA=1;  while(int0\_Mark);  EA=0;  TR0=0;    uc10ms--;    if(uc10ms==0){  uc10ms=100;uc1s--;  }  P1=HEXtoBCD(uc10ms);    if(uc1s==00){  uc1s=59;uc60s--;  }  P2=HEXtoBCD(uc1s);    if(uc60s==60){  uc60s=0;  }  P3=HEXtoBCD(uc60s);    if(!pauseButton)  {  while(pauseButton);  while(!pauseButton)  {  if(!pauseButton)  {  P1=HEXtoBCD(uc10ms);  P2=HEXtoBCD(uc1s);  P3=HEXtoBCD(uc60s);  }  if(exitButton==0)  {  exitButton=0;  break;  }  while(!pauseButton);  }  }  if(!resetButton)  {  uc10ms=0;  uc1s=0;  uc60s=12;  P1=HEXtoBCD(uc10ms);  P2=HEXtoBCD(uc1s);  P3=HEXtoBCD(uc60s);  }  }  }  }  void timer0() interrupt 1  {  EA=0;  int0\_Mark=0;  TR0=0;  TH0=0xDC;TL0=0x00;  TR0=1;  EA=1;  }  （3）  #include <REGX52.H>  sbit startButton=P0^0;  sbit pauseButton=P0^1;  sbit resetButton=P0^2;  sbit exitButton=P0^3;  sbit modeButton = P0^4;  bit int0\_Mark;  unsigned char HEXtoBCD(unsigned char hex)  {  return((hex/10)\*16+(hex%10));  }  void main()  {  unsigned char flag=1,uc1ms=0,uc10ms=0,uc1s=0;  TMOD=0x01;  IE=0x82;  while(1)  {  TH0=0xFC;TL0=0x18;  uc1ms=0;uc10ms=0;uc1s=0;  if(modeButton==0)  {  uc1s=99;  }  P1=HEXtoBCD(uc1ms);  P2=HEXtoBCD(uc10ms);  P3=HEXtoBCD(uc1s);  while(startButton);  while(!startButton);  if(modeButton==1)  {  while(exitButton)  {  int0\_Mark=1;  TH0=0xFC;TL0=0x18;  TR0=1;  EA=1;  while(int0\_Mark);  EA=0;  TR0=0;  uc1ms++;    if(uc1ms==10){  uc10ms++;uc1ms=0;  }  P1=HEXtoBCD(uc1ms);  if(uc10ms==100)  {  uc10ms=0;uc1s++;  }  P2=HEXtoBCD(uc10ms);  if(uc1s==100)  uc1s=0;  P3=HEXtoBCD(uc1s);  if(!pauseButton)  {  while(pauseButton);  while(!pauseButton)  {  if(!pauseButton)  {  P1=HEXtoBCD(uc1ms);  P2=HEXtoBCD(uc10ms);  P3=HEXtoBCD(uc1s);  }  if(exitButton==0)  {  exitButton=0;  break;  }  while(!pauseButton);  }  }  if(!resetButton)  {  uc1ms=0;  uc10ms=0;  uc1s=0;  P1=HEXtoBCD(uc1ms);  P2=HEXtoBCD(uc10ms);  P3=HEXtoBCD(uc1s);  }  }  }  if(modeButton==0)  {  while(exitButton)  {  int0\_Mark=1;  TH0=0xFC;TL0=0x18;  TR0=1;  EA=1;  while(int0\_Mark);    uc1ms--;  if(uc1ms==0){  uc10ms--;uc1ms=10;  }  P1=HEXtoBCD(uc1ms);  if(uc10ms==0)  {  uc10ms=100;uc1s--;  }  P2=HEXtoBCD(uc10ms);  if(uc1s==0)  uc1s=99;  P3=HEXtoBCD(uc1s);  if(!pauseButton)  {  while(pauseButton);  while(!pauseButton)  {  if(!pauseButton)  {  P1=HEXtoBCD(uc1ms);  P2=HEXtoBCD(uc10ms);  P3=HEXtoBCD(uc1s);  }  if(exitButton==0)  {  exitButton=0;  break;  }  while(!pauseButton);  }  }  if(!resetButton)  {  uc1ms=0;  uc10ms=0;  uc1s=99;  P1=HEXtoBCD(uc1ms);  P2=HEXtoBCD(uc10ms);  P3=HEXtoBCD(uc1s);  }  }  }  }  }  void timer0() interrupt 1  {  EA=0;  int0\_Mark=0;  TR0=0;  TH0=0xFC;TL0=0x18;  TR0=1;  EA=1;  }  3、主要模块程序流程图。     1. 实验数据调试及讨论 2. 第一二个实验都是定时10ms，将TH0设为0xDC，TL0设为0x00，实现每次跳10ms， 而第三个实验是将定时设为1ms，TH0设为0xFC，TL0设为0x18. 3. 第一二个实验都只有一种计时方式，区别在于变化是正还是倒，例如第一个实验是当10ms-1000ms时1s++；而第二个实验是当1000ms-0ms时1s--； 4. 第三个实验可以选择正计时或倒计时，默认正计时，选择退出按钮后，按下P0\_4对应的按钮，可以进行倒计时。      1. 软件清单   Proteus ISIS与Kill5。 |