EE3046 Microcomputer Theory and Laboratory, Spring 2017

Homework W01

Due date: 2017.02.19 Sunday

What are your thoughts on the features of the ATmega328P microcontroller, which are listed below. Please describe at least three of your thoughts.

There is no standard answer to this question. Your answer can be and should be subjective. For example, one of your thoughts may be 「I don't like it. It has too many instructions. How can I remember 131 instructions?」.

Please send your answer in a Microsoft word file to ncuee3046@gmail.com. The word file's name and the email subject (主旨) should follow the format "(Student ID number) (Student's name) (Homework number)", for example, "102509876 蔡查理 W01". The homework number "W01" stands for "Week 01".

Features
* High Performance, Low Power Atmel®AVR® 8-Bit Microcontroller Family
* Advanced RISC Architecture
  –131 Powerful Instructions – Most Single Clock Cycle Execution
  –32 x 8 General Purpose Working Registers
  –Fully Static Operation
  –Up to 20 MIPS Throughput at 20MHz
  –On-chip 2-cycle Multiplier
* High Endurance Non-volatile Memory Segments
  –4/8/16/32KBytes of In-System Self-Programmable Flash program memory
  –256/512/512/1KBytes EEPROM
  –512/1K/1K/2KBytes Internal SRAM
  –Write/Erase Cycles: 10,000 Flash/100,000 EEPROM
  –Data retention: 20 years at 85°C/100 years at 25°C(1)
  –Optional Boot Code Section with Independent Lock Bits
    ♦ In-System Programming by On-chip Boot Program
    ♦ True Read-While-Write Operation
  –Programming Lock for Software Security
* Atmel® QTouch® library support
  –Capacitive touch buttons, sliders and wheels
  –QTouch and QMatrix® acquisition
  –Up to 64 sense channels
* Peripheral Features
  –Two 8-bit Timer/Counters with Separate Prescaler and Compare Mode
  –One 16-bit Timer/Counter with Separate Prescaler, Compare Mode, and Capture Mode
  –Real Time Counter with Separate Oscillator
  –Six PWM Channels
  –8-channel 10-bit ADC in TQFP and QFN/MLF package
    ♦ Temperature Measurement
  –6-channel 10-bit ADC in PDIP Package
    ♦ Temperature Measurement
  –Programmable Serial USART
  –Master/Slave SPI Serial Interface
  –Byte-oriented 2-wire Serial Interface (Philips I2 C compatible)
  –Programmable Watchdog Timer with Separate On-chip Oscillator
  –On-chip Analog Comparator
  –Interrupt and Wake-up on Pin Change