模块 7

测验： 有限状态机

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Q1 指针与字符串

编写一个比较两个以 null 结尾的字符串的函数。 指向两个字符串的指针通过引用传递给函数。 如果字符串不匹配，则返回参数将为 0；如果字符串匹配，则返回参数将为非零。 原型是

int StringCompare(char *pt1, char *pt2);

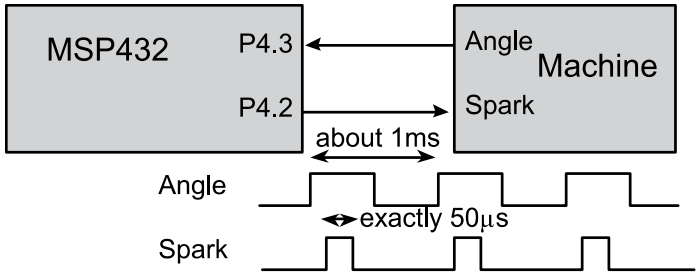
Q2 数组与索引

写出一个计算两个数组的点积的函数。每个数组都有十个 32 位有符号整数。原型是：

int32_t DotProduct(int32_t buf1[10], int32_t buf2[10]);

Q3 有限状态机

使用链表有限状态机设计一个基于微机的控制器。该系统具有一个输入和一个输出。



输入**角度**是一个周期信号，频率为 20 到 1000 Hz（周期为 1 到 50 ms）。 每次**角度**从 0 变为 1 时，输出**触发**应为正脉冲（正好为 50µs 宽）。**角度**上升沿和**触发**脉冲开始之间的延迟应尽可能短。 **角度**的周期可以在 1 毫秒到 50 毫秒之间变化。 由于**角度**是输入，您无法控制它，只响应其上升沿。

a) 为该系统设计一个输入，一个输出有限状态机。 绘制状态转换图。使用描述性的状态名。
b) 显示 C 代码以创建静态分配的链表。 包含声明，将其放入微型计算机的 ROM 中。
c) 显示 C 语言控制器。 控制器可以没有条件语句（如果没有开关，没有条件运算符）。 假设这是微型计算机执行的唯一任务， 即，显示所有必要的说明。 使程序在复位上自动启动。 您可以在 **Clock.c** 中调用函数。

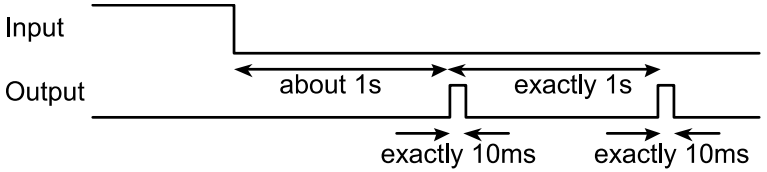
Q4 有限状态机

设计具有两个输入和两个输出的 FSM。 输入在端口 4 位 0,1 上，输出在端口 5 位 0,1 上。 最初输出为 00。您也可以假设两个输入都是 0。机器等待第一个输入变为 1。如果 P4.1 先变为高电平，则将输出设置为 10，如果 P4.0 先变为高电平，则 输出转到 01，如果两个输入同时变为高电平，则输出变为 11。

a) 为该系统设计两输入，两输出有限状态机。 绘制状态转换图。 使用描述性的状态名。
b) 显示 C 代码以创建静态分配的链表。 将下一个状态实现为指针，包含语句以将其放入微型计算机的 ROM 中。
c) 显示 C 语言控制器。 控制器可以没有条件语句（如果没有开关，没有条件运算符）假设这是微机执行的唯一任务。 即，显示所有必要的说明。 使程序在复位上自动启动。 您可以在 **Clock.c** 中调用函数。

Q5 有限状态机

您将使用 Moore FSM 设计起搏器。 有一个输入和一个输出。 如果心脏自己跳动，输入将会很高。 如果心脏没有自己跳动，输入将是低的。 如果心脏没有击打你的机器应该放心。 如果心脏单独跳动，输入将很高，输出应该很低。 但是，如果输入为低电平，则应通过每 1000 ms 输出 10 ms 输出脉冲来调节心率。 P4.0 输出，P4.1 输入。



a) 为该系统设计一个输入，一个输出有限状态机。 绘制状态转换图。 使用描述性的状态名
b) 显示 C 代码以创建静态分配的链表。 包含声明，将其放入微型计算机的 ROM 中。
c) 显示 C 语言控制器。 控制器可以没有条件语句（如果没有开关，没有条件运算符）。 假设这是微型计算机执行的唯一任务。 即，显示所有必要的说明。 使程序在复位上自动启动。 您可以在 **Clock.c** 中调用函数。

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