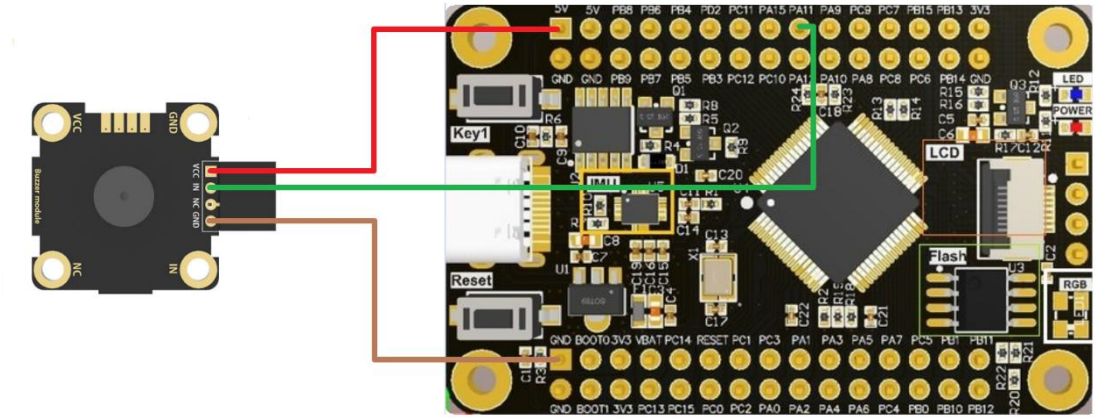
Passive Buzzer singing

1. Learning Target

In this course, we mainly learn to use STM32F103RCT6 drive passive buzzer to sing "Happy Birthday".

2. Preparation before Class

The hardware needed is STM32F103RCT6 development board, passive buzzer module, Dupont line.



passive buzzer module	STM32F103RCT6
VCC	3.3V
GND	GND
IN	PA11

3.code snippet

Initializes the buzzer pin

```
void BEEP_Init(void)
{
  GPIO_InitTypeDef  GPIO_InitStructure;
  RCC_APB2PeriphClockCmd(RCC_APB2Periph_GPIOA, ENABLE);
  GPIO_InitStructure.GPIO_Pin = GPIO_Pin_11;
  GPIO_InitStructure.GPIO_Mode = GPIO_Mode_Out_PP;
  GPIO_InitStructure.GPIO_Speed = GPIO_Speed_50MHz;
  GPIO_Init(GPIOA, &GPIO_InitStructure);
  GPIO_ResetBits(GPIOA,GPIO_Pin_11);

}
```

The song is represented by two arrays, one is the pitch and one is the duration of the pitch.

```
void play_music(void)
{
//
//    uc16 tone[] = {247,262,294,330,349,392,440,294,523,587,659,698,784,1000};
//    u8 music[]={5,5,6,8,7,6,5,6,13,13,5,5,6,8,7,6,5,3,13,13,2,2,3,5,3,5,6,3,2,1,6,6,5,6,5,3,6,5,13,13,
//                  5,5,6,8,7,6,5,6,13,13,5,5,6,8,7,6,5,3,13,13,2,2,3,5,3,5,6,3,2,1,6,6,5,6,5,3,6,1,
//                13,8,9,10,10,9,8,10,9,8,6,13,6,8,9,9,8,6,9,8,6,5,13,2,3,5,5,3,5,5,6,8,7,6,6,10,9,9,8,6,5,6,8 };
//    u8 time[] = {2,4,2,2,2,2,2,8,4, 4,2,4,2,2,2,2,2,8,4, 4, 2,4,2,4,2,2,4,2,2,8,2,4,2,2,2,2,2,8,4 ,4,
//                 2,4,2,2,2,2,2,8,4, 4,2,4,2,2,2,2,2,8,4,4,2,4,2,4,2,2,4,2,2,8,2,4,2,2,2,2,2,8,
//                 4,2,2,2,4,2,2,2,2,2,8,4,2,2,2,4,2,2,2,2,2,8,4,2,2,2,4,2,2,5,2,6,2,4,2,2,2,4,2,4,2,2,12 };

/*****************************************************************************************************************************/

//
                  // 0   1   2   3   4   5   6   7  低1  低2 低3 低4 低5 低6低7
    uc16 tone[] ={250,262,294,330,350,393,441,495,525,589,661,700,786,882,990}; //
    u8 music[]={5,5,6,5,8,7,5,5,6,5,9,8,5,5,12,10,8,7,6,11,
                  11,10,8,9,8,5,5,8,5,5,12,10,8,7,6,11,11,10,8,9,8    //
    };
        u8 time[] = {1,2,2,2,2,4,1,2,2,2,2,4,1,2,2,2,1,4,
                       4,1,2,2,2,2,4,1,2,4,1,2,2,2,1,4, 4,1,2,2,2,2,4,4        //
        };

    u32 yanshi;
    u16 i,e;
    yanshi = 10;
    for(i=0;i<sizeof(music)/sizeof(music[0]);i++){
        for(e=0;e<((u16)time[i])*tone[music[i]]/yanshi;e++){
            Sound((u32)tone[music[i]]);
        }
    }
}
```

4.Experimental Phenomenon

After the program download completed, the single chip connected to the electricity, we can hear the buzzer "sing" Happy birthday song.