```
#include "pwm.h"
//端子などの定義
#define Un (D4)
#define Vn (D13)
#define Wn (D8)
#define Hu (D1)
#define Hv (D0)
#define Hw (D2)
#define VR (A0)
#define PWMHz 20000.0f
//PWMクラスからインスタンスを生成
PwmOut pwmU(5);    //5pin Up
PwmOut pwmV(10);   //10pin Vp
PwmOut pwmW(9);    //9pin Wp

void setup() {
  pinMode(Hu, INPUT_PULLUP);  // set input mode with pull-up MOS for hall sensor
  pinMode(Hv, INPUT_PULLUP);
  pinMode(Hw, INPUT_PULLUP);
  digitalWrite(Un, HIGH);
  digitalWrite(Vn, HIGH);
  digitalWrite(Wn, HIGH);
  pinMode(Un, OUTPUT);
  pinMode(Vn, OUTPUT);
  pinMode(Wn, OUTPUT);
  attachInterrupt(Hu, HuIrq, CHANGE);  // attach interrupt
  attachInterrupt(Hv, HvIrq, CHANGE);
  attachInterrupt(Hw, HwIrq, CHANGE);

  while(analogRead(VR) > 20);
  pulseOutput();
  pwmU.begin(PWMHz, 0.0f);   //5pin 周期  50us = 20kHz; パルス幅 0%
  pwmW.begin(PWMHz, 0.0f);   //9pin 周期  50us = 20kHz; パルス幅 0%
  pwmV.begin(PWMHz, 0.0f);   //10pin 周期  50us = 20kHz; パルス幅 0%
}

void loop() {
  float speed;
  speed = analogRead(VR) * 100 * 5.0f / 3.3f / 1024.0f;  //A0端子の入力値を0～100%に変換
  if(speed > 100) speed = 100;  //リミッタ処理
  if(speed < 0) speed = 0;
  pulseOutput();  //パルスデューティを出力に設定
  delay(1);  //待ち時間は適当に設定
}

// Hall sennsor Interrupt
//ホールセンサ割込み
void HuIrq() {  //U-Hall change interrupt
  pulseOutput();
}

void HvIrq() {  //V-Hall change interrupt
  pulseOutput();
}

void HwIrq() {  //W-Hall change interrupt
  pulseOutput();
}

// change pulse output pin
//ホールセンサの位置に合わせたPwM出力
void pulseOutput() {
int hall;

hall = 0;  // check hall sensor state
hall = digitalRead(Hw);
hall |= digitalRead(Hv) << 1;
hall |= digitalRead(Hu) << 2;
hall &= 0x07;
switch(hall){
  case 1: //0,
  digitalWrite(Un,1);
  digitalWrite(Vn,0); //W相上アームをPWM→V相下アームをONして電流を流す
  digitalWrite(Wn,1);
  pwmU.pulse_perc(0);
  pwmV.pulse_perc(0);
  pwmW.pulse_perc(speed);
  break;
  case 3: //60
  digitalWrite(Un,1);
  digitalWrite(Vn,0); //U相上アームをPWM→V相下アームをONして電流を流す
  digitalWrite(Wn,1);
  pwmU.pulse_perc(speed);
  pwmV.pulse_perc(0);
  pwmW.pulse_perc(0);
  break;
  case 2: //120
```

```
digitalWrite(Un,1);
digitalWrite(Vn,1);
digitalWrite(Wn,0); //U相上アームをPWM→W相下アームをONして電流を流す
pwmU.pulse_perc(speed);
pwmV.pulse_perc(0);
pwmW.pulse_perc(0);
break;
case 6: //180
digitalWrite(Un,1);
digitalWrite(Vn,1);
digitalWrite(Wn,0); //V相上アームをPWM→W相下アームをONして電流を流す
pwmU.pulse_perc(0);
pwmV.pulse_perc(speed);
pwmW.pulse_perc(0);
break;
case 4: //240
digitalWrite(Un,0); //V相上アームをPWM→U相下アームをONして電流を流す
digitalWrite(Vn,1);
digitalWrite(Wn,1);
pwmU.pulse_perc(0);
pwmV.pulse_perc(speed);
pwmW.pulse_perc(0);
break;
case 5: //300
digitalWrite(Un,0); //W相上アームをPWM→U相下アームをONして電流を流す
digitalWrite(Vn,1);
digitalWrite(Wn,1);
pwmU.pulse_perc(0);
pwmV.pulse_perc(0);
pwmW.pulse_perc(speed);
break;
default:
break; //ホールセンサが不正な値を示した時は何もしない
  }
}
```