Task 3-2
Harry in the Maze

1)Harry:

```
int Sensor_1 = 3 ;
int Sensor_2 = 4;
int Sensor_3 = 5;
int State_1 , State_2 ,State_3 ;
```

- First, we define the Sensor ports so we can use it easily later in the code, and we define Three variables to carry the values of the sensors inputs.

```
Serial.begin(9600);
pinMode(Sensor_1, INPUT);
pinMode(Sensor_2, INPUT);
pinMode(Sensor_3, INPUT);
```

- Second, we declare the inputs in setup.

```
void loop()
{
  State_1 = digitalRead (Sensor_1);
  State_2 = digitalRead (Sensor_2);
  State_3 = digitalRead (Sensor_3);

  if (State_1 == LOW && State_2 == HIGH && State_3 == LOW)
  {
    Serial.print("Move Forward");
  }
  else if (State_1 == LOW && State_2 == LOW && State_3 == LOW)
  {
    Serial.print("Move Backward");
  }
   else if (State_1 == LOW && State_2 == LOW && State_3 == HIGH)
   {
     Serial.print("Rotate 90 degree to the right");
   }
   else if (State_1 == HIGH && State_2 == LOW && State_3 == LOW)
   {
     Serial.print("Rotate 90 degree to the left");
   }
```

- Then, we put the if conditions for the movement according to the sensor's inputs.

2)Safe:

```
#define signal1_A  2
#define signal1_B  3
#define signal2_A  4
#define signal2_B  5
#define signal3_A  6
#define signal3_B  7
int G_led = 8;
long long counter1 =0;
long long counter2 =0;
long long counter3 =0;
int angle1 , angle2 , angle3 ;
```

- First, we define the encoder signal ports so we can use it easily later in the code, and we define the led port , the three counters and the three angles .

```
void setup()
{
  pinMode(G_led,OUTPUT);
  pinMode(signal1_A,INPUT_PULLUP);
  pinMode(signal1_B,INPUT_PULLUP);
  attachInterrupt(digitalPinToInterrupt(signal1_A),ISR_A,CHANGE);
  attachInterrupt(digitalPinToInterrupt(signal1_B),ISR_B,CHANGE);
  pinMode(signal2_A,INPUT_PULLUP);
  pinMode(signal2_B,INPUT_PULLUP);
  attachInterrupt(digitalPinToInterrupt(signal2_A),ISR2_A,CHANGE);
  attachInterrupt(digitalPinToInterrupt(signal2_B),ISR2_B,CHANGE);
  pinMode(signal3_A,INPUT_PULLUP);
  pinMode(signal3_B,INPUT_PULLUP);
  attachInterrupt(digitalPinToInterrupt(signal3_A),ISR3_A,CHANGE);
  attachInterrupt(digitalPinToInterrupt(signal3_B),ISR3_B,CHANGE);
  Serial.begin(50000);
```

- Second, we declare the inputs and the interrupts for the encoders in setup.

```
void loop()
{
  angle1 = (counter1*9);
  angle2 = (counter2*9);
  angle3 = (counter3*9);
  if (angle1==37 && angle2==10 && angle3==54)
  {
    digitalWrite(G_led,HIGH);
  }
```

- Then, we calculate the angles for the encoders, and declare the if condition to turn the led on.

```
void ISR_A()
{
  if (digitalRead(signal1_A)!= digitalRead(signal1_B))
   counter1++;
  else
   counter1--;
}

void ISR_B()
{
  if (digitalRead(signal1_A)<= digitalRead (signal1_B))
   counter1++;
  else
   counter1--;
}
void ISR2 A()
```

- Then, we declare the ISR function for each encoder.