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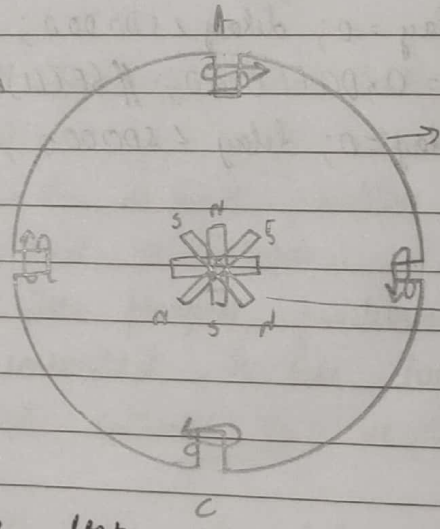
Lab Program NO: 11

Write an embedded C program to Interface and control a Stepper Motor.

Stepper Motor: are DC motors that move in discrete steps. They have multiple coils that are organized in groups called "phases". By energizing each phase in sequence, motor will rotate one step at a time. With computer controlled stepping you can achieve very precise positioning and/or speed control.

A B C D Energized Poles
1 0 1 0 A and C
0 1 0 1 B and D



Wave step

Coil A	Coil B	Coil C	Coil D
H	L	L	L
L	H	L	L
L	L	H	L
L	L	L	H

P	Pins
P0.12	A
P0.13	B
P0.14	C
P0.15	D

Energizing

	P0.12	P0.13	P0.14	P0.15
Pole A	1	0	0	0
Pole B	0	1	0	0
Pole C	0	0	1	0
Pole D	0	0	0	1

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Stepper Motor Embedded C Program:

```
#include <LPC21xx.H>
void clock_wise (void);
void anti_clock_wise(void);
unsigned long int var1, var2;
unsigned int i=0, j=0, k=0;

int main()
{
  PINSEL0 = 0x00000000;
  IO0DIR  = 0x0000F0000;
  while(1)
  { for(j=0; j<50; j++)
    clock_wise();
    for(k=0; k<50; k++)
    anti_clock_wise();
    for(k=0; k<65000; k++);
  }
}

void clock_wise(void)
{ var1 = 0x00000800;
  for(i=0; i<=3; i++)
  { var1 = var1 << 1;
    IO0PIN = var1;
  for(k=0; k<60000; k++);
}
}

void anti_clockwise(void)
{ var1 = 0x00010000;
  for(i=0; i<=3; i++)
  { var1 = var1 >> 1;
```

```
IOOPIN = var I;
    for(k=0; k<60000 ; k++);
  }
}
```

Output: The step motor will rotate clockwise and anti-clockwise.