

# nature porter

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## 1. Introduction to gameplay

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The purpose of this experiment is to stack four building blocks of different colors from bottom to top in the order of blue, green, red and yellow and place them on the gray block in the middle. Then run the code, and the robot arm will pick up the fourth layer of blocks and place them. Go to the yellow area, pick up the third layer of blocks and put them in the red area, pick up the second layer of blocks and put them in the green area, pick up the bottom block and put them in the blue area in sequence. The way to place the building blocks is as shown in the figure below:



After executing the code, the robot arm will carry the building blocks to the corresponding position. The final effect is as shown in the figure below:



## 2. Code content

Code path:/root/Dofbot/3.ctrl\_Arm/10.move\_block.ipynb

```
#!/usr/bin/env python3
#coding=utf-8
import time
from Arm_Lib import Arm_Device
#Create a robotic arm object
Arm = Arm_Device()
time.sleep(.1)
```

```
# Define the function of clamping building blocks, enable=1: clamp, =0: release
def arm_clamp_block(enable):
    if enable == 0:
        Arm.Arm_serial_servo_write(6, 60, 400)
    else:
        Arm.Arm_serial_servo_write(6, 130, 400)
        time.sleep(.5)
# Define the mobile robot arm function and control the movement of servos No. 1-5
at the same time, p=[S1, S2, S3, S4, S5]
def arm_move(p, s_time = 500):
    for i in range(5):
        id=i+1
        if id == 5:
            time.sleep(.1)
            Arm.Arm_serial_servo_write(id, p[i], int(s_time*1.2))
        else :
            Arm.Arm_serial_servo_write(id, p[i], s_time)
            time.sleep(.01)
```

```
        time.sleep(s_time/1000)
# Robotic arm moves up
def arm_move_up():
    Arm.Arm_serial_servo_write(2, 90, 1500)
    Arm.Arm_serial_servo_write(3, 90, 1500)
    Arm.Arm_serial_servo_write(4, 90, 1500)
    time.sleep(.1)
```

```
# Define variable parameters at different locations
p_mould = [90, 130, 0, 0, 90]
p_top = [90, 80, 50, 50, 270]
p_Yellow = [65, 22, 64, 56, 270]
p_Red = [117, 19, 66, 56, 270]
p_Green = [136, 66, 20, 29, 270]
p_Blue = [44, 66, 20, 28, 270]
p_layer_4 = [90, 72, 49, 13, 270]
p_layer_3 = [90, 66, 43, 20, 270]
p_layer_2 = [90, 63, 34, 30, 270]
p_layer_1 = [90, 53, 33, 36, 270]
```

```
# Let the robotic arm move to a position ready to grab
arm_clamp_block(0)
arm_move(p_mould, 1000)
time.sleep(1)
# Move the fourth layer of building blocks to the yellow area
arm_move(p_top, 1000)
arm_move(p_layer_4, 1000)
arm_clamp_block(1)
arm_move(p_top, 1000)
arm_move(p_Yellow, 1000)
arm_clamp_block(0)
time.sleep(.1)
arm_move_up()
arm_move(p_mould, 1100)

# time.sleep(1)
```

```
# Move the third layer of building blocks to the red area
arm_move(p_top, 1000)
arm_move(p_layer_3, 1000)
arm_clamp_block(1)
arm_move(p_top, 1000)
arm_move(p_Red, 1000)
arm_clamp_block(0)
time.sleep(.1)
arm_move_up()
arm_move(p_mould, 1100)

# time.sleep(1)
```

```
# Move the second layer of building blocks to the green area
arm_move(p_top, 1000)
arm_move(p_layer_2, 1000)
arm_clamp_block(1)
arm_move(p_top, 1000)
arm_move(p_Green, 1000)
arm_clamp_block(0)
time.sleep(.1)
arm_move_up()
arm_move(p_mould, 1100)

# time.sleep(1)
```

```
# Move the first layer of building blocks to the blue area
arm_move(p_top, 1000)
arm_move(p_layer_1, 1000)
arm_clamp_block(1)
arm_move(p_top, 1000)
arm_move(p_Blue, 1000)
arm_clamp_block(0)
time.sleep(.1)
arm_move_up()
arm_move(p_mould, 1100)

# time.sleep(1)
```

```
del Arm # Release the Arm object
```