

Script:

```
#!/usr/bin/env python
# coding: latin-1

# Setup the libraries ready for use
import ThunderBorg
# Initialisierung ThunderBorg
TB = ThunderBorg.ThunderBorg()
TB.Init()

# Load the library
# Create a board object
# Setup the board

import UltraBorg
UB = UltraBorg.UltraBorg()
UB.Init()
import time
import os
import sys
from threading import Thread

# Variablen initialisieren

maxpower = 12.0 / 12.0
dist1 = 0
dist2 = 0
act_dist1 = 0
act_dist2 = 0
act_dist3 = 0
act_dist4 = 0
stopp = 0
speed = 0
min_dist = 0

print("Test Motor 1 Sek an")
TB.SetMotors(0.5 * maxpower)
time.sleep(1)
TB.MotorsOff()

def readdistance():

    global act_dist1
    global act_dist2
    global act_dist3
```

```
global act_dist4
```

```
while True:
```

```
    act_dist1 = UB.GetDistance1()
    act_dist2 = UB.GetDistance2()
    act_dist3 = UB.GetDistance3()
    act_dist4 = UB.GetDistance4()
    act_dist1 = int(act_dist1)
    act_dist2 = int(act_dist2)
    act_dist3 = int(act_dist3)
    act_dist4 = int(act_dist4)
    print("act_dist1 read ", act_dist1)
    print("act_dist2 read ", act_dist2)
    print("act_dist3 read ", act_dist3)
    print("act_dist4 read ", act_dist4)
    time.sleep(0.5)
```

```
def control():
```

```
    global stopp
    global act_dist1
    global act_dist2
    global act_dist3
    global act_dist4
    global maxpower
    global speed
    global min_dist
    stopp = 0
```

```
while stopp == 0:
```

```
    if (act_dist1 != 0) or (act_dist2 != 0) and (act_dist1 <= 10000) or (act_dist2 <= 10000):
```

```
        dist1 = act_dist1
        dist2 = act_dist2
        print("After check >0 und <10000")
        print("dist1 nach min-max ", dist1)
        print("dist2 nach min-max", dist2)
        print("speed ", str(speed))
        #time.sleep(5)
```

```
# Steuerung der Geschwindigkeit bis zum Hindernis in
# drei Stufen. Die letzte Stufe direkt vor dem Hinternis
```

```
# stoppt das Roboter-Auto und laest es rueckwaerts
# weiter fahren.
```

```
if (min_dist + 1500 <= dist1 <= min_dist + 10000) and (min_dist + 1500 <= dist2 <=
min_dist + 10000):
```

```
    print("After check >1500 und <3000")
    print("dist1 ", dist1)
    print("dist2 ", dist2)
    speed = 0.5
    print("speed auf 0.5 ", str(speed))
    TB.SetMotors(speed * maxpower)
    #time.sleep(2)
```

```
elif (min_dist + 750 <= dist1 <= min_dist + 1500) and (min_dist + 750 <= dist2 <=
min_dist + 1500):
```

```
    print("After check >750 und <1500")
    print("dist1 ", dist1)
    print("dist2 ", dist2)
    speed = 0.4
    print("speed auf 0.4 ", str(speed))
    TB.SetMotors(speed * maxpower)
    #time.sleep(2)
```

```
elif (min_dist + 400 <= dist1 <= min_dist + 750) and (min_dist + 400 <= dist2 <= min_dist
+ 750):
```

```
    print("After check >400 und <750")
    print("dist1 ", dist1)
    print("dist2 ", dist2)
    speed = 0.30
    print("speed auf 0.3 ", str(speed))
    TB.SetMotors(speed * maxpower)
    #time.sleep(2)
```

```
elif dist1 or dist2 <= 400:
```

```
    print("After check <= 400")
    print("dist1 ", dist1)
    print("dist2 ", dist2)
    speed = 0
    print("speed auf 0 Motor stopp ", str(speed))
    TB.SetMotors(speed * maxpower)
    time.sleep(2)
    #if direction == "f":
    # direction = "r"
    # Zeigt den Pfeil fuer das rueckwaerts Fahren an.
```

```

        #matrix.display_pixels("arrow")
        #matrix.display_rotate(270)
    # elif direction == "r":
    #     direction = "f"
    # Zeigt den Pfeil fuer das vorwaerts Fahren an.
    #matrix.display_pixels("arrow")
    #matrix.display_rotate(90)

else:
    # Damit das Auto bei einer Entfernung groesser
    # 100 + min_dist losfaehrt wird diese Abfrage
    # gebraucht die speed von 0 auf 0.5 setzt.
    print("Else check, all ok speed on 0.5")
    speed = 0.5

    TB.SetMotors(speed * maxpower)

```

```

t_readdistance = Thread(target=readdistance)
t_readdistance.start()
t_control = Thread(target=control)
t_control.start()
t_readdistance.join()
t_control.join()

```

Log Output

```

pi@raspi:~/auto_robot $ sudo python autonom_dist13.py
Loading ThunderBorg on bus 1, address 15
Found ThunderBorg at 15
ThunderBorg loaded on bus 1
Loading UltraBorg on bus 1, address 36
Found UltraBorg at 36
UltraBorg loaded on bus 1
Test Motor 1 Sek an
After check >0 und <10000
('dist1 nach min-max ', 0)
('dist2 nach min-max', 0)
('speed ', '0')
After check <= 400
('dist1 ', 0)
('dist2 ', 0)
('speed auf 0 Motor stopp ', '0')

```

('act_dist1 read ', 1585)
('act_dist2 read ', 1582)
('act_dist3 read ', 437)
('act_dist4 read ', 429)
('act_dist1 read ', 1586)
('act_dist2 read ', 1581)
('act_dist3 read ', 435)
('act_dist4 read ', 429)
('act_dist1 read ', 1589)
('act_dist2 read ', 1583)
('act_dist3 read ', 436)
('act_dist4 read ', 429)
('act_dist1 read ', 1590)
('act_dist2 read ', 1583)
('act_dist3 read ', 436)
('act_dist4 read ', 429)
After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')
After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')
After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')
After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')

After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')
After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')
After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')
After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')
After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')

After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')
After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')
After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')
After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')
After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')

After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')
After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')
After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')
After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')
After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')

After check >0 und <10000
('dist1 nach min-max ', 1590)
('dist2 nach min-max', 1583)
('speed ', '0.5')
After check >1500 und <3000
('dist1 ', 1590)
('dist2 ', 1583)
('speed auf 0.5 ', '0.5')
Failed reading ultrasonic #1 distance!
After check >0 und <10000
('dist1 nach min-max ', None)
('dist2 nach min-max', 1583)
('speed ', '0.5')
Else check, all ok speed on 0.5
After check >0 und <10000
('dist1 nach min-max ', None)
('dist2 nach min-max', 1583)
('speed ', '0.5')
Else check, all ok speed on 0.5
After check >0 und <10000
('dist1 nach min-max ', None)
('dist2 nach min-max', 1583)
('speed ', '0.5')
Else check, all ok speed on 0.5
After check >0 und <10000
('dist1 nach min-max ', None)
('dist2 nach min-max', 1583)
('speed ', '0.5')
Else check, all ok speed on 0.5
After check >0 und <10000
('dist1 nach min-max ', None)
('dist2 nach min-max', 1583)
('speed ', '0.5')
Else check, all ok speed on 0.5
After check >0 und <10000
('dist1 nach min-max ', None)
('dist2 nach min-max', 1583)
('speed ', '0.5')
Else check, all ok speed on 0.5
Failed reading ultrasonic #2 distance!
After check >0 und <10000
('dist1 nach min-max ', None)
('dist2 nach min-max', None)
('speed ', '0.5')
After check <= 400
('dist1 ', None)
('dist2 ', None)
('speed auf 0 Motor stopp ', '0')

Exception in thread Thread-1:

Traceback (most recent call last):

```
File "/usr/lib/python2.7/threading.py", line 801, in __bootstrap_inner
    self.run()
```

```
File "/usr/lib/python2.7/threading.py", line 754, in run
    self.__target(*self.__args, **self.__kwargs)
```

```
File "autonom_dist13.py", line 55, in readdistance
    act_dist1 = int(act_dist1)
```

TypeError: int() argument must be a string or a number, not 'NoneType'

After check >0 und <10000

```
('dist1 nach min-max ', None)
```

```
('dist2 nach min-max', None)
```

```
('speed ', '0')
```

After check <= 400

```
('dist1 ', None)
```

```
('dist2 ', None)
```

```
('speed auf 0 Motor stopp ', '0')
```

After check >0 und <10000

```
('dist1 nach min-max ', None)
```

```
('dist2 nach min-max', None)
```

```
('speed ', '0')
```

After check <= 400

```
('dist1 ', None)
```

```
('dist2 ', None)
```

```
('speed auf 0 Motor stopp ', '0')
```

After check >0 und <10000

```
('dist1 nach min-max ', None)
```

```
('dist2 nach min-max', None)
```

```
('speed ', '0')
```

After check <= 400

```
('dist1 ', None)
```

```
('dist2 ', None)
```

```
('speed auf 0 Motor stopp ', '0')
```

```
^Z
```

```
[13]+ Angehalten          sudo python autonom_dist13.py
```

```
pi@raspi:~/auto_robot $
```