



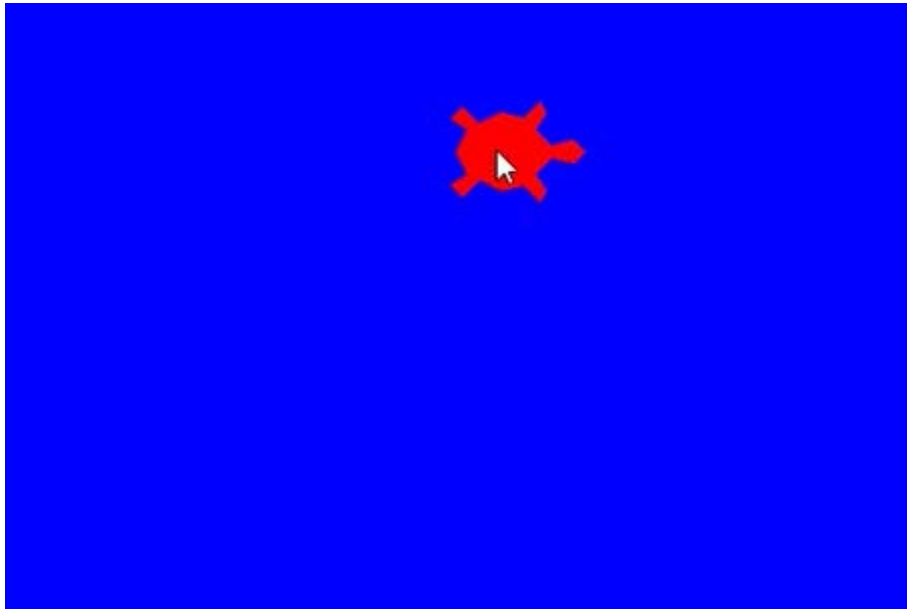
## Lesson 17: Mouse and Keyboard Control (Function `ondrag()`)

Today we continue investigate event-driven programs. Let's experiment examples using `ondrag()` function. Turtle graphics allows you to respond to mouse drag events with the `ondrag` function. Like the `onclick` function, the `ondrag` function expects another function as an argument. The latter function is triggered repeatedly, while the user drags the mouse from one position to another in the turtle graphics window. Initially, you must position the mouse on the turtle's shape for the first drag event to be detected. As before, the event-handling function's two arguments will be the current mouse coordinates.

### 1. Example #1 (Turtle moves according `ondrag` function)

```
import turtle
wn=turtle.Screen()
wn.bgcolor('blue')
t1= turtle.Turtle('turtle')
t1.penup()
t1.color('red')
t1.shapesize(3)
t1.speed('fastest')

def dragging(x, y):
    #t1.ondrag(None)
    #t1.setheading(t1.towards(x, y))
    t1.goto(x, y)
    t1.ondrag(dragging)
t1.ondrag(dragging)
```



## 2. **Example #2** (Turtle moves and specifies the space orientation)

```
import turtle
wn=turtle.Screen()
wn.bgcolor('blue')
t1= turtle.Turtle('turtle')
t1.penup()
t1.color('red')
t1.shapesize(3)
t1.speed('fastest')

def dragging(x, y):
    t1.ondrag(None)
    t1.setheading(t1.towards(x, y))
    t1.goto(x, y)
    t1.ondrag(dragging)
t1.ondrag(dragging)
```

### 3. Example #3 (Example #1 with two turtles)

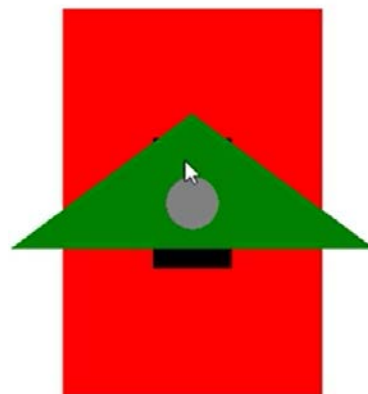
```
import turtle
wn=turtle.Screen()
wn.bgcolor('gold')
t1= turtle.Turtle('turtle')
t1.penup()
t1.color('red')
t1.shapesize(3)

t2= turtle.Turtle('turtle')
t2.color('blue')
t2.shapesize(2)
t2.up()
t2.goto(100,100)

def dragging(x, y):
    t1.ondrag(None)
    t1.goto(x, y)
    t1.ondrag(dragging)
    #reset()
t1.ondrag(dragging)

def dragging2(x, y):
    t2.ondrag(None)
    t2.goto(x, y)
    t2.ondrag(dragging2)
    #reset()
t2.ondrag(dragging2)
```

### 4. Example #4 (Build our house)



**Video result:**

<https://youtu.be/pFRGnwrFAyQ>

## Code:

```
import turtle
wn=turtle.Screen()
t1= turtle.Turtle('square')
t1.shapesize(15,10)
t1.penup()
t1.color('red')
t1.speed('fastest')

t2= turtle.Turtle('square')
t2.shapesize(5,3)
t2.penup()
t2.color('black')
t2.speed('fastest')

t3= turtle.Turtle('triangle')
t3.shapesize(14,6)
t3.left(90)
t3.penup()
t3.color('green')
t3.speed('fastest')

t4= turtle.Turtle('circle')
t4.shapesize(2)
t4.left(90)
t4.penup()
t4.color('grey')
t4.speed('fastest')

def dragging1(x, y):
    t1.goto(x, y)

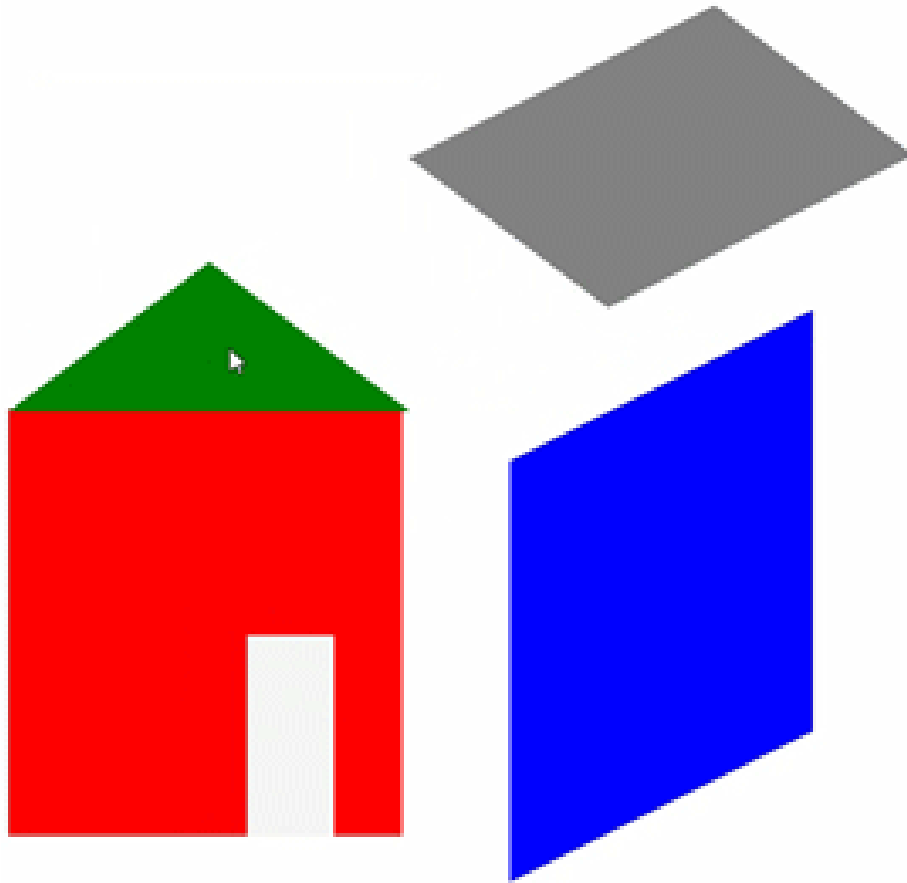
def dragging2(x, y):
    t2.goto(x, y)

def dragging3(x, y):
    t3.goto(x, y)

def dragging4(x, y):
    t4.goto(x, y)

t1.ondrag(dragging1)
t2.ondrag(dragging2)
t3.ondrag(dragging3)
t4.ondrag(dragging4)
```

## 5. Example #5 (Build 3D-House)



**Video Result**

<https://youtu.be/tDgwecF0kP8>

## Code:

```
import turtle
wn=turtle.Screen()
wn.setup(1000,1000)
turtle.tracer(2)
TEXT_FONT=('Arial', 20,'bold')
capture=turtle.Turtle()
capture.hideturtle()
capture.up()
capture.setposition(-400,-300)
capture.write('Build a House dragging parts with a mouse', font=TEXT_FO
t=[]
sh=['square','square','triangle','square','square','square']
clr=['red','whitesmoke','green','whitesmoke','blue','gray']
for n in range (6):
    t.append(turtle.Turtle())
    t[n].shape(sh[n])
    t[n].up()
    t[n].color(clr[n])
    t[n].speed('fastest')
t[0].shapessize(15,13.8)
t[0].goto(-300,200)
t[1].shapessize(7,3)
t[1].goto(-300,-100)
t[2].shapessize(14,6)
t[2].goto(300,200)
t[2].left(90)
t[3].shapessize(2)
t[3].shearfactor(-0.5)
t[3].goto(300,-100)
t[4].shapessize(12,7.8)
t[4].right(-116.5)
t[4].shearfactor(-0.5)
t[4].goto(0,300)
t[5].shapessize(14.8,10.6)
t[5].right(0)
t[5].shearfactor(-0.5)
t[5].goto(0,-10)
def dragging0(x, y):
    t[0].goto(x, y)

def dragging1(x, y):
    t[1].goto(x, y)

def dragging2(x, y):
    t[2].goto(x, y)

def dragging3(x, y):
    t[3].goto(x, y)

def dragging4(x, y):
    t[4].goto(x, y)

def dragging5(x, y):
    t[5].goto(x, y)

my_dragg=[dragging0,dragging1,dragging2,dragging3,dragging4,dragging5]

for m in range (6):
    t[m].ondrag(my_dragg[m])
```

## 6. Example#6 (Butterfly with function onclick())

```
import turtle
wn=turtle.Screen()
import time
wn.setup(1200,1100)
wn.bgcolor('pink')
wn.bgpic('grass.gif')
t1=turtle.Turtle()
t2=turtle.Turtle()
t3=turtle.Turtle()
t4=turtle.Turtle()
t5=turtle.Turtle()
t6=turtle.Turtle()
t7=turtle.Turtle()

t1.up()
t2.up()
t3.up()
t4.up()
t5.up()
t6.up()
t7.up()

image1='flo1.gif'
image2='flo2.gif'
image3='flo3.gif'
image4='flo4.gif'
image5='flo5.gif'
image6='flo6.gif'
image=[]
for i in range (118):
    #print(i)
    il=str(i)
    image.append(il+'.gif')

wn.addshape (image1)
t1.shape (image1)
t1.goto (-100,-230)

wn.addshape (image2)
t2.shape (image2)
t2.goto (-300,-420)

wn.addshape (image3)
t3.shape (image3)
t3.goto (300,-170)

wn.addshape (image4)
t4.shape (image4)
t4.goto (0,235)

wn.addshape (image5)
t5.shape (image5)
t5.goto (-150,380)

wn.addshape (image6)
t6.shape (image6)
t6.goto (400,-450)

while True:

    for i in range (18):

        wn.addshape (image [i])
        t7.shape (image [i])
        time.sleep (0.1)

    def fly(x, y):
        t7.goto(x, y)

    wn.onclick(fly)
```



**Video Result:**

[https://youtu.be/tDESIsOs\\_0Y](https://youtu.be/tDESIsOs_0Y)