COMP1021
Introduction to Computer Science

Clicking on the Turtle Window

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Events We Have Looked At

- So far, we have looked at the following events:
  - Click (clicking on a turtle)
    e.g. `turtle.onclick(drawcircle)`
  - Drag (dragging a turtle)
    e.g. `turtle.ondrag(moveturtle)`
  - Pressing a key on the keyboard
    e.g. `turtle.onkeypress(dosomething)`
- Now let's look at using this event:
  - Clicking on the turtle window (not on a turtle)

Clicking on the Turtle Window

- `onscreenclick()` is used for when you click on the turtle window (the event does not occur if you click on a turtle)
- For example:

```
def myfunction(x, y):
    . . .
```

x and y give the location where the click occurred, they are automatically given to the function

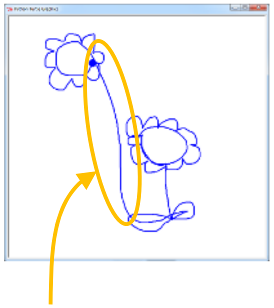
```
turtle.onscreenclick(myfunction)
```

The mouse click event is applied to the turtle window

When the user clicks somewhere on the turtle window (but not on a turtle) the `myfunction` *function will be executed*

Improving the Previous Drawing Program

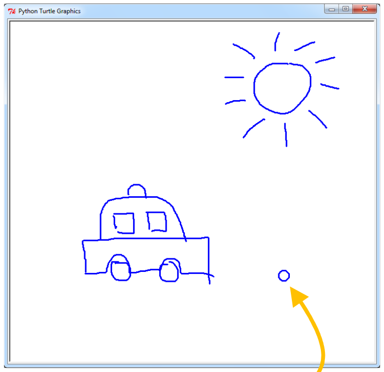
- In previous discussions, we showed a 'drawing program' which used the mouse drag event
- A problem with that program is that the resulting lines have to be connected
- We can improve that drawing program by also using the *screenclick* event to jump to a new place



When the previous program is used an unwanted line connects everything

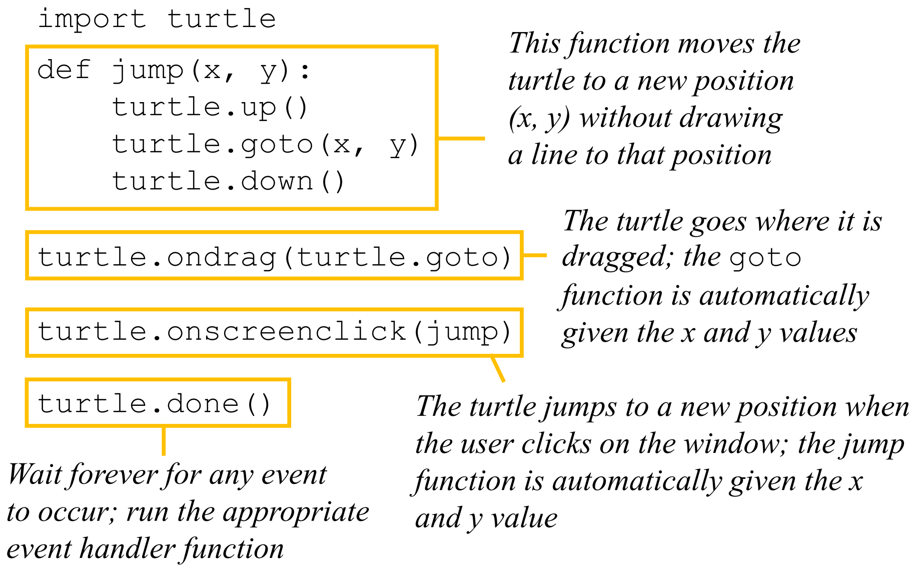
Improving the Drawing Program

- Using the screenclick event the turtle can ‘jump’ to a new position – without drawing any line from the old position
- An example picture drawn using the improved drawing program is shown on the right
- That means pictures can be created which are not made from a single long line



This is the appearance of the turtle in the improved drawing example

Improved Drawing Program



```
import turtle
def jump(x, y):
    turtle.up()
    turtle.goto(x, y)
    turtle.down()
turtle.ondrag(turtle.goto)
turtle.onscreenclick(jump)
turtle.done()
```

This function moves the turtle to a new position (x, y) without drawing a line to that position

The turtle goes where it is dragged; the `goto` *function is automatically given the x and y values*

The turtle jumps to a new position when the user clicks on the window; the jump function is automatically given the x and y value

Wait forever for any event to occur; run the appropriate event handler function

Making the Turtle Better

- The code on the previous slide gives the most important code in the program (i.e. the code which handles the event)
- However, this code is also included in the program to make the turtle easier to see and drag around:

```
turtle.shape("circle")     # Looks better than a triangle
turtle.fillcolor("")       # Make the circle hollow
turtle.shapesize(1, 1, 3)  # Make the outline thicker
turtle.pencolor("blue")    # Looks nicer than black
turtle.pensize(3)          # Make the drawn lines thicker
turtle.speed(0)            # Make the turtle move quickly
```