### Screen Setup

**setup()** - Set the size and position of the graphics window

```python
setup(width=800, height=800)
ssetup(width=800, height=600, startx=0, starty=0)
```

**title()** - Set the title of graphics window

```python
title("My first program")
```

**bgpic()** - Set the background image of the graphics window.
Accepts only GIF images

```python
bgpic("my-background.gif")
```

**clearscreen()** - Delete everything from the graphics window and sets a white background

```python
clearscreen()
```

**exitonclick()** - Close the graphics window when the screen is clicked

```python
exitonclick()
```

### Coordinates

**home()** – Move turtle to the origin – coordinates (0, 0) – and set its heading to its start-orientation

```python
home()
```

**goto()** - Move turtle to an absolute position without changing turtle’s orientation. If the pen is down, draw line

```python
goto(200, -100)
```

**setx()** - Set the turtle’s first coordinate (x), leave second coordinate unchanged

```python
setx(-50)
```

**sety()** - Set the turtle’s second coordinate (y), leave first coordinate unchanged

```python
sety(150)
```

### Pen Control

**pendown()** - Pull the pen down – drawing when moving

```python
pendown()
```

**penup()** - Pull the pen up – no drawing when moving

```python
penup()
```

**pensize()** - Set the line/boundary thickness to the specified width

```python
pensize(width=10)
```

**hideturtle()** - Make the turtle invisible. It’s a good idea to do this while you’re in the middle of doing some complex drawing, because hiding the turtle speeds up the drawing observably

```python
hideturtle()
```

**showturtle()** - Make the turtle visible

```python
showturtle()
```
### Writing on Screen

**write()** - Write text at the current turtle position according to `align` ("left", "center" or right) and with the given `font`. A font is a triple specifying `fontname`, `fontsize` and `fonttype`. Font type can be any combination of “bold” or “normal” with “italic” and/or “underline”

- `write("Loyola")`
- `write("Loyola", align="left")`
- `write("Tanzania", align="center", font=("Arial", 16, "bold underline"))`
- `write("Tanzania", align="center", font=("Calibri", 16, "normal italic underline"))`

### Motion and Drawing

- **`dot()`** - Draw a circular dot with diameter `size`, using `color`.
  ```python
dot()
dot(50, "red")
```

- **`forward()`** - Move the turtle forward by the specified distance, in the direction the turtle is headed
  ```python
  forward(50)
  ```

- **`backward()`** - Move the turtle backward by distance, opposite to the direction the turtle is headed without changing the turtle's heading/direction
  ```python
  backward(60)
  ```

- **`right()`** - Turn turtle right by specified angle. Units are in degrees by default, but can be set via the `degrees()` and `radians()` functions
  ```python
  right(90)
  ```

- **`left()`** - Turn turtle left by specified angle. Units are in degrees by default, use `radians()` function to specify angles in radians
  ```python
  left(120)
  ```

- **`circle()`** - Draw a circle with given radius. `extent` - an angle – determines which part of the circle is drawn (by default it is 360 degrees. E.g. If extent is 180 degrees, a semi-circle will be drawn
  ```python
  circle(100)
circle(100, extent=180)
  ```

- **`undo()`** - Undo (repeatedly) the last turtle action(s)
  ```python
  undo()
  ```

- **`speed()`** - Set the turtle’s speed to an integer value in the range of 0 to 10. 1 is the slowest and 10 the fastest. 0 disables animations and turtles move at the fastest speed possible. “fastest”: 0, “fast”: 10, “normal”: 6, “slow”: 3, “slowest”: 1
  ```python
  speed(6)
speed("normal")
  ```

### Input Methods

- **`textinput()`** - Pop up a dialog window for input of a string. Parameter `title` is the title of the dialog window, `prompt` is a text mostly describing what information to input. Return the string input. If the dialog is canceled, return None
  ```python
  name = textinput(title="User Details", prompt="Please enter your name")
  ```

- **`numinput()`** - Pop up a dialog window for input of a number. `title` is the title of the dialog window, `prompt` is a text mostly describing what numerical information to input. `minval` is the minimum value for input and `maxval` is the maximum value for input
  ```python
  age = numinput(title="Age", prompt="Please enter your age", minval=0, maxval=100)
  ```

Reference: [https://docs.python.org/3/library/turtle.html](https://docs.python.org/3/library/turtle.html)
### Color Control

<table>
<thead>
<tr>
<th>bgcolor() - Set the background color of the graphics window</th>
</tr>
</thead>
<tbody>
<tr>
<td>bgcolor(&quot;black&quot;)</td>
</tr>
<tr>
<td>bgcolor(0, 0, 0)</td>
</tr>
</tbody>
</table>

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<tr>
<th>pencolor() - Set the pen color (boundary of the drawing)</th>
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<tr>
<td>pencolor(&quot;white&quot;)</td>
</tr>
<tr>
<td>pencolor(255, 255, 255)  # If the color mode is 255</td>
</tr>
<tr>
<td>pencolor(1, 1, 1)  # If the color mode is 1</td>
</tr>
</tbody>
</table>

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<tr>
<th>fillcolor() - Set the fillcolor (interior of a drawing)</th>
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</tr>
<tr>
<td>fillcolor(0, 0, 0)</td>
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<th>begin_fill() - To be called just before drawing a shape to be filled</th>
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<th>end_fill() – Fill all the shapes that were drawn since the last</th>
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<td>begin_fill()</td>
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<td>end_fill()</td>
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### Events and States

Reference: [https://docs.python.org/3/library/turtle.html](https://docs.python.org/3/library/turtle.html)