

# Week five

[Help Center](#)

## Mouse events — Mouse input

- SimpleGUI supports two event handlers for mouse events.
- The mouse clicked event handler is triggered when the mouse is clicked. The handler is registered via `set_mouseclick_handler`.
- The mouse dragged event handler is triggered when the mouse is clicked and dragged. This handler is registered via `set_mousedragged_handler`.
- The variable passed to each of these handlers is the position of the mouse in canvas coordinates when the event is triggered.
- Lecture examples - [Mouse Input](#)
- More examples - [Ball Movement](#), [Click Lines](#), [Tic-Tac-Toe](#)

## List methods — List methods

- Given a list `lst`, the methods `lst.append()`, `lst.extend()` add a single element and an entire list to the end of the list `lst`, respectively.
- The list method `lst.index()` returns the index of an item in a list.
- The list methods `lst.remove()`, `lst.pop()` remove item by its value and its index, respectively, from the list.
- The list methods `lst.reverse()`, `lst.sort()` reverse and sort the list, respectively.
- Lecture examples - [List Methods](#)
- More examples - [More List Methods](#)

## Iteration and list comprehension — List examples

- A iterable object is one that is capable of returning its members one at a time.
- Strings, lists, dictionaries and sets are examples of iterable objects.
- The compound statement `for x in lst: ...` successively assigns `x` to elements of the iterable object `lst` and executes the body of the statement with this assignment.
- The expression `[exp for x in lst]` is a list comprehension associated with the list `lst`. Its value is the list generated by assigning `x` to be successive elements in `lst` and evaluating `exp`.
- Lecture examples - [List of Balls](#), [Color Changing Balls](#), [Removing Balls](#)
- More examples - [Numbered List](#), [Factors](#), [Equilateral Polygons](#)

## Dictionaries — Dictionaries

- A dictionary `d` is a collection of pairs of the form `key:value` enclosed in curly brackets `{}`.
- Given a key `k`, the Python expression `d[k]` returns the value `v` associated with the key.
- New items can be added to the dictionary via assignments `d[key] = val`.
- Lecture examples - [Cipher](#)
- More examples - [Secret Code](#), [Shape Colors](#)

## Loading and drawing images — Images

- The SimpleGUI function `load_image` takes the URL for an image and loads it into CodeSkulptor.
- The methods `image.get_width()` and `image.get_height()` return the width and height of a loaded image. Note that these methods return zero while the image is loading.
- `draw_image` takes an image and a source rectangle and draws the portion of the image, restricted to the source rectangle, onto a destination rectangle on the canvas.

- `draw_image` supports transparency via alpha channels in `.png` images.
- CodeSkulptor assets (images and sounds) can be stored in Dropbox and loaded via a public URL (with "?dl=1" appended).
- Lecture examples - [Map Magnifier](#)
- More examples - [Image Backgrounds](#), [Image Changes](#)

## Programming Tips — Week 5

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