

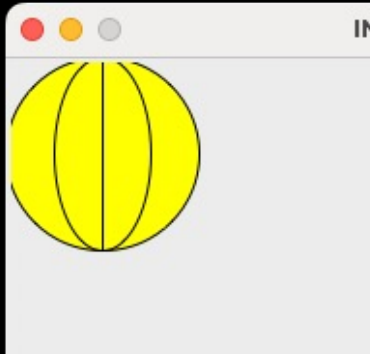
GRAFISKE BRUKERGRENSESNITT

INF100

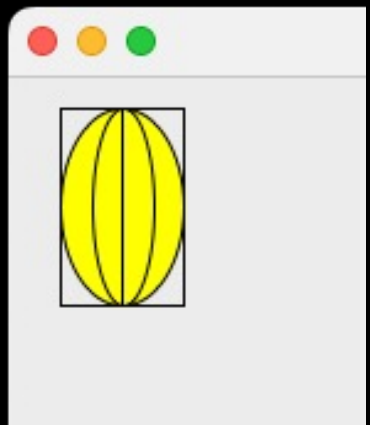
HØST 2024

Torstein Strømme

FLEKSIBLE TEGNINGER



```
def draw_ball_fixed(canvas):  
    canvas.create_oval(0, 0, 100, 100, fill='yellow')  
    canvas.create_oval(25, 0, 75, 100)  
    canvas.create_line(50, 0, 50, 100)
```

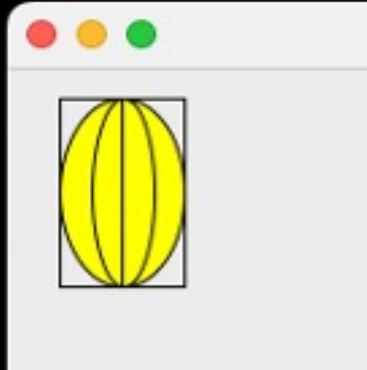


```
def draw_ball_scaled(canvas, width, height):  
    ...
```

```
def draw_ball_shifted(canvas, dx, dy):  
    ...
```

```
def draw_ball_in_box(canvas, x1, y1, x2, y2):  
    ...
```

FLEKSIBLE TEGNINGER



```
def draw_ball_in_box(canvas, x1, y1, x2, y2):  
    std_width = 100  
    std_height = 100  
    width = x2 - x1  
    height = y2 - y1  
    w_factor = width / std_width  
    h_factor = height / std_height
```

```
canvas.create_oval(  
    0 * w_factor + x1,  
    0 * h_factor + y1,  
    100 * w_factor + x1,  
    100 * h_factor + y1,  
    fill='yellow'  
)
```

samme som før

alle x-verdier

alle y-verdier

```
...
```



EVENT_APP



```
from uib_inf100_graphics.event_app import run_app

def app_started(app):
    app.count = 42

def key_pressed(app, event):
    app.count += 1

def redraw_all(app, canvas):
    cx = app.width / 2
    cy = app.height / 2
    canvas.create_text(cx, cy, text=f'{app.count}', font='Arial 60')

run_app(width=500, height=200)
```



```
from uib_inf100_graphics.event_app import run_app

def app_started(app):
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```

← *for å starte programmet*



```
from uib_inf100_graphics.event_app import run_app
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def app_started(app):  
    app.count = 42
```



kalles når programmet starter

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def key_pressed(app, event):  
    app.count += 1
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```

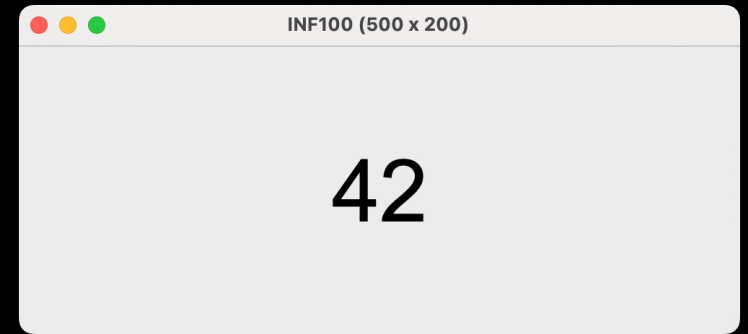
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def app_started(app):  
    app.count = 42
```

```
def key_pressed(app, event):  
    app.count += 1
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def redraw_all(app, canvas):  
    cx = app.width / 2  
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*tenk på **app** som en samling med variabler*



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    canvas.create_text(cx, cy, text=f'{app.count}', font='Arial 60')
```

```
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oppretter en ny variabel «count»




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kalles (av uib_inf100_graphics) når lerretet skal tegnes



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tegning gjøres akkurat som før





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variabler for width og height finnes i app fra før



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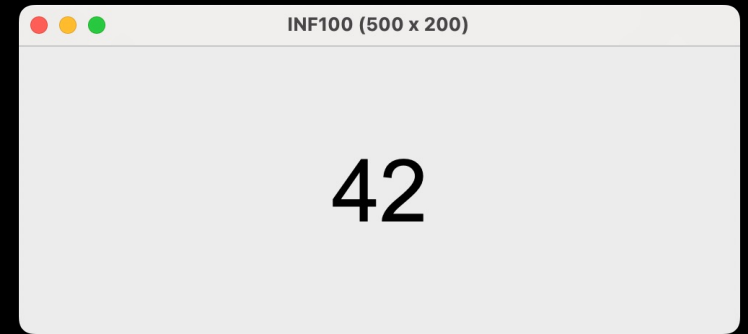
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def redraw_all(app, canvas):  
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    canvas.create_text(cx, cy, text=f'{{app.count}}', font='Arial 60')
```

```
run_app(width=500, height=200)
```

variabel vi nettopp opprettet i app_started



`app.count`



```
from uib_inf100_graphics.event_app import run_app
```

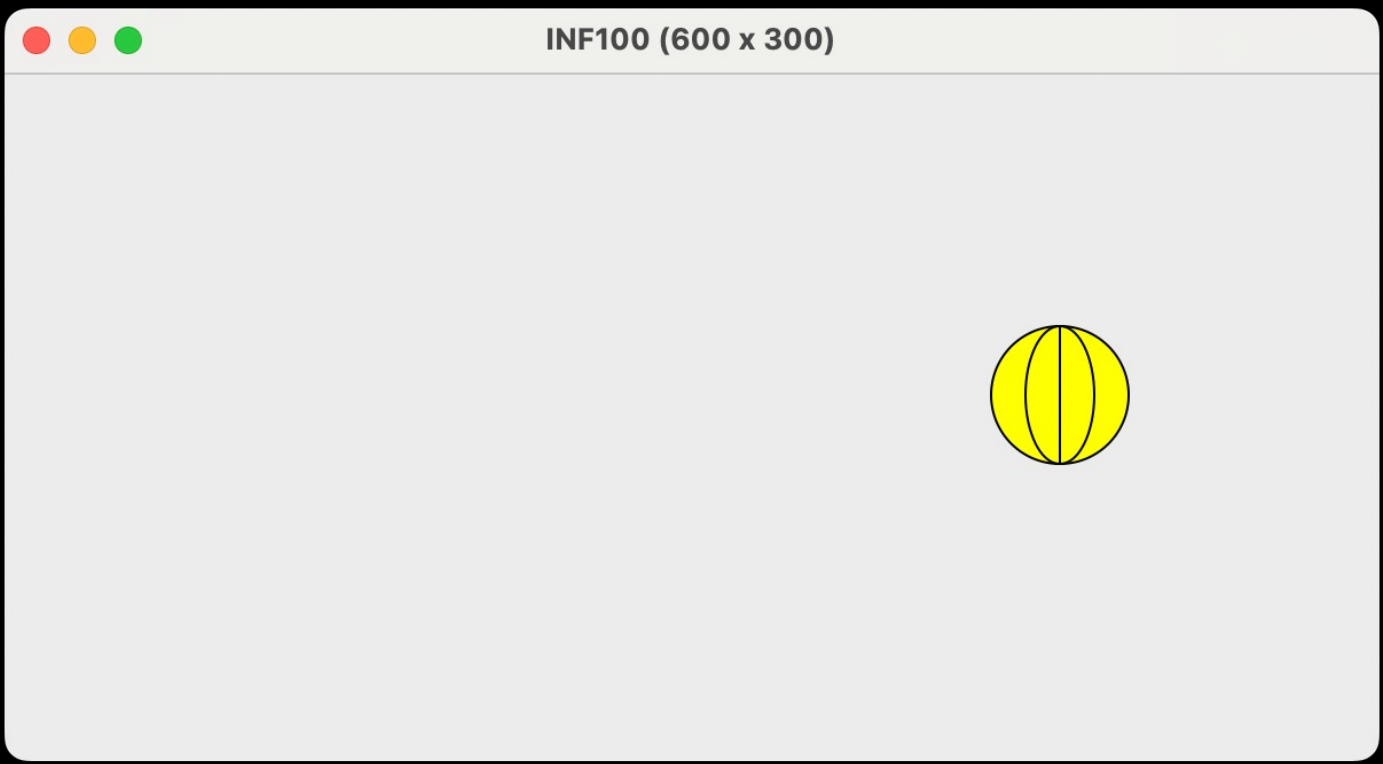
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def app_started(app):  
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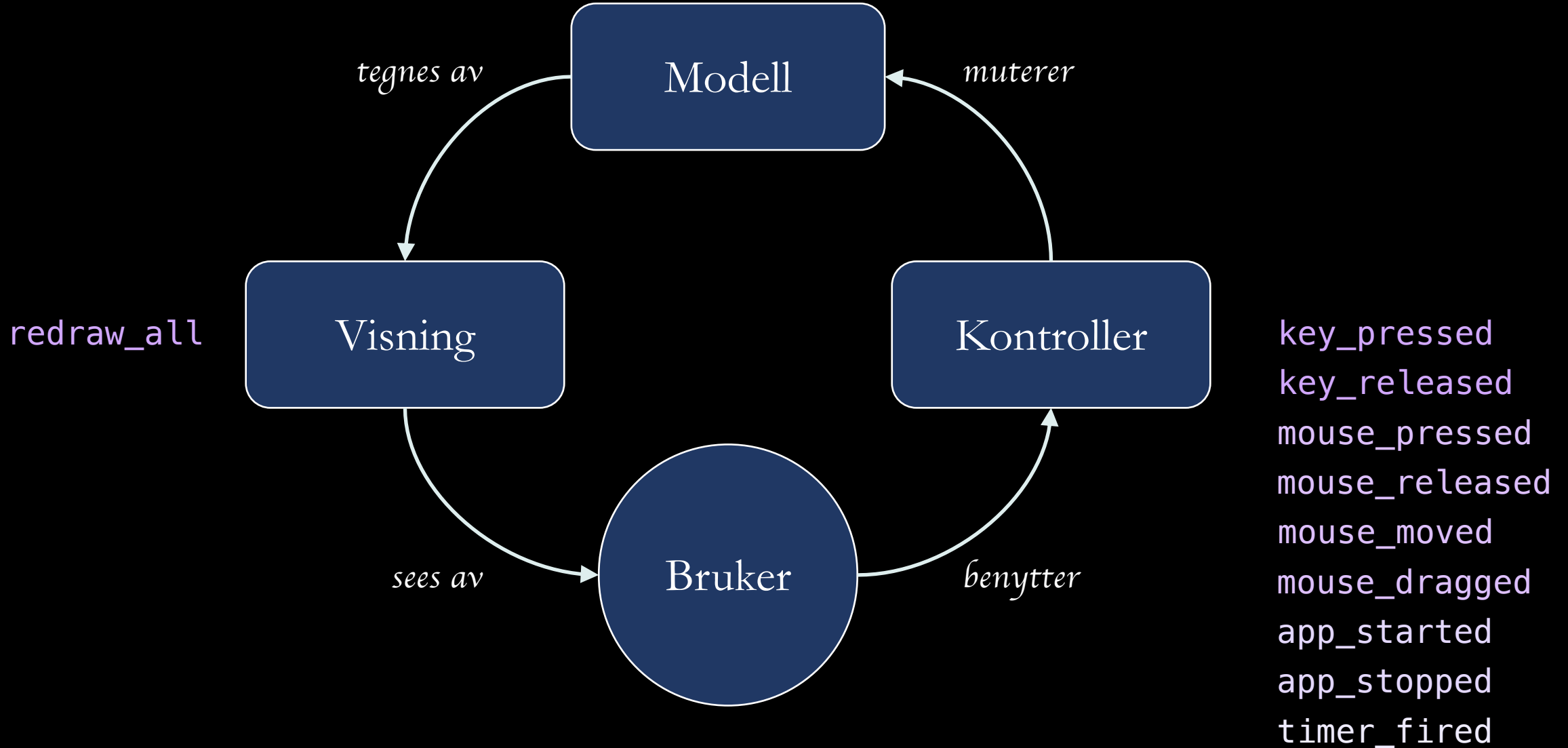
```
def redraw_all(app, canvas):  
    cx = app.width / 2  
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```

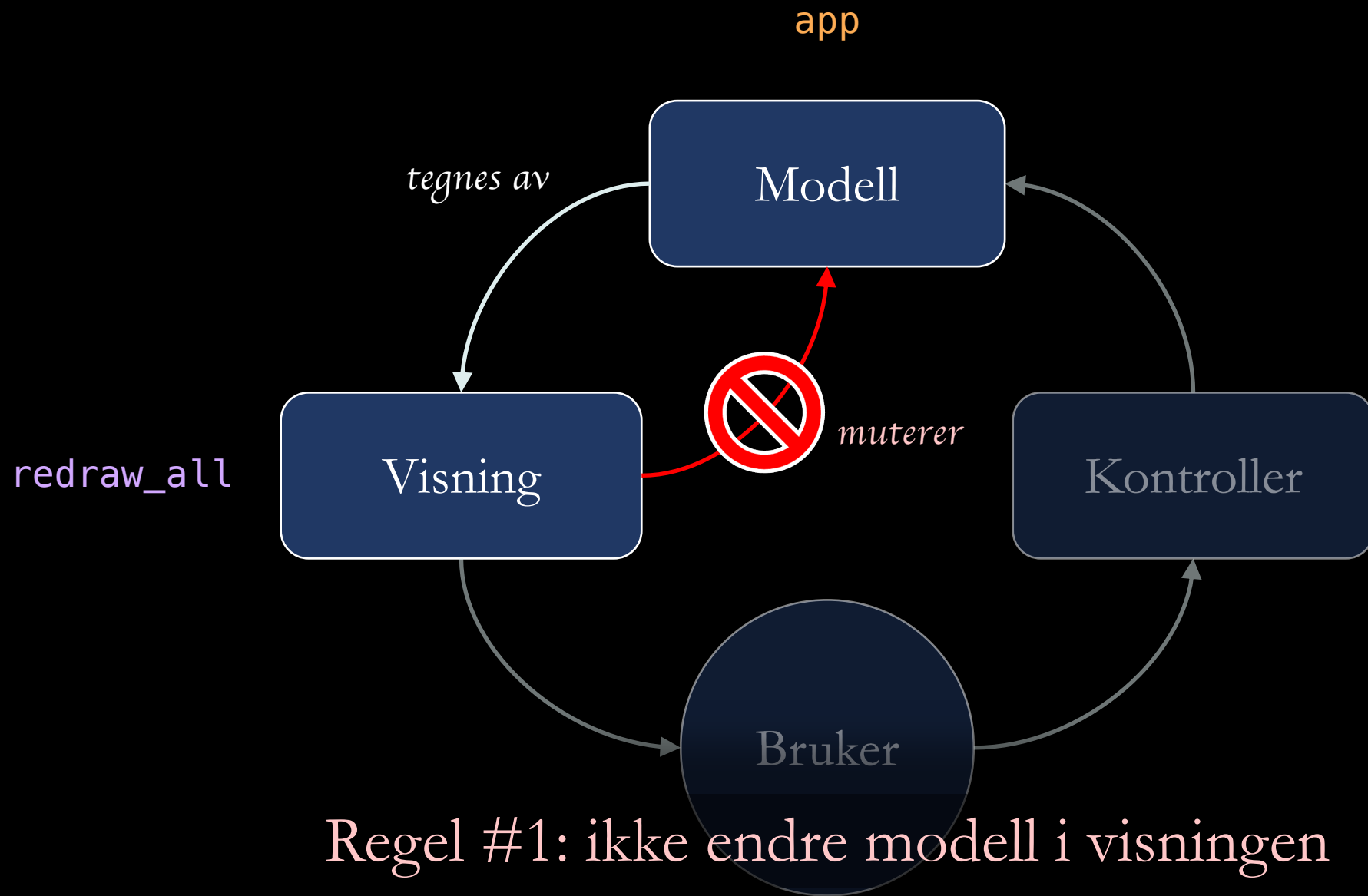
```
run_app(width=500, height=200)
```

← kalles hver gang en tast trykkes

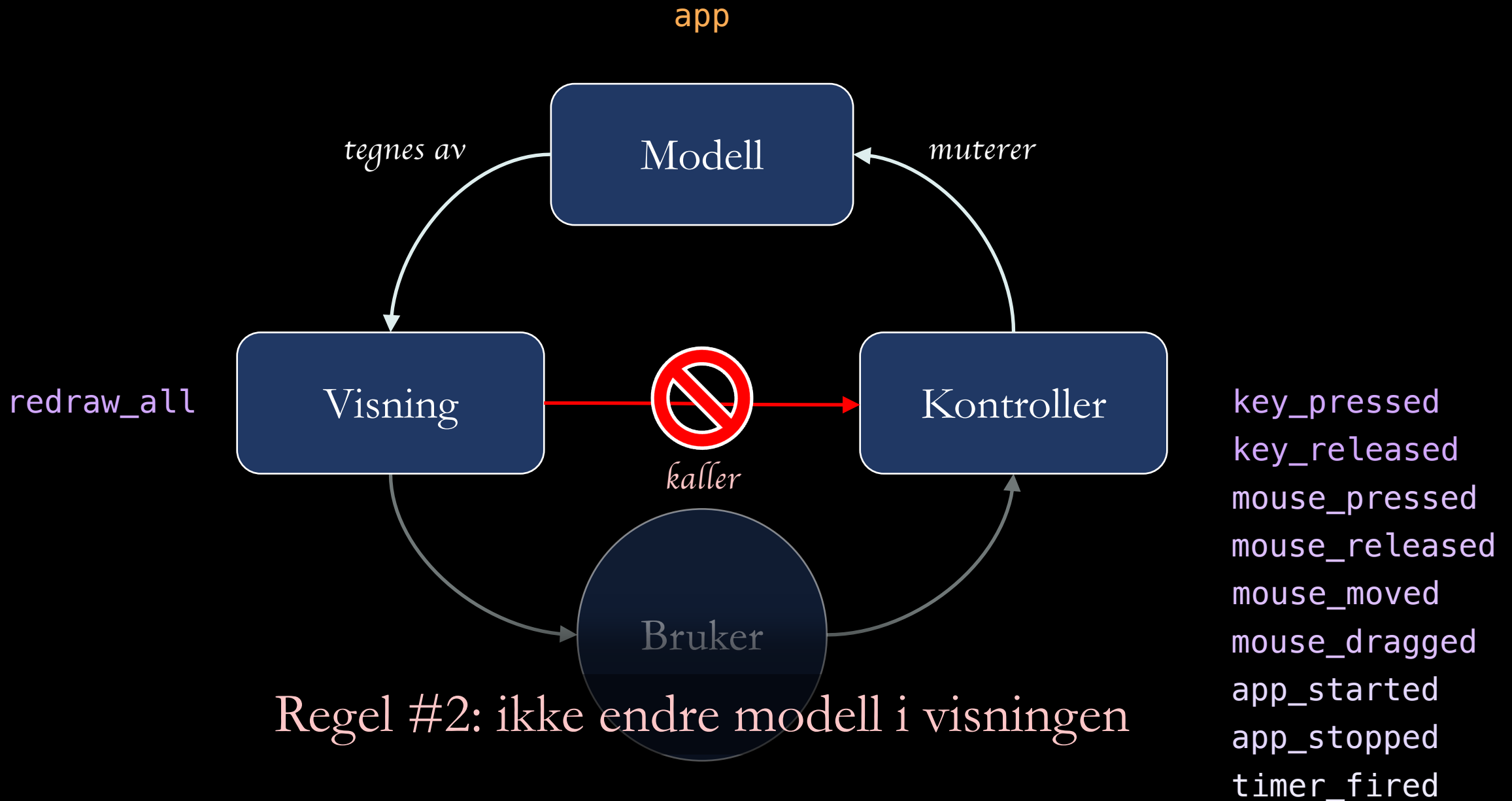


app





Regel #1: ikke endre modell i visningen



TEGNEPROGRAM

