## 1 GameObject

```
GameObject = \begin{cases} \text{posição}: \vec{p} = (x,y) \\ tamanho: \vec{s} = (x,y) \\ \text{ângulo da tela}: \mu \to \mathbb{R} \\ \text{posição na tela}: \vec{d} = (x,y) \\ \text{zoom da tela}: \beta \to \mathbb{R} \\ \text{ângulo}: \alpha \to \mathbb{R} \\ \text{velocidade angular}: \theta \to \mathbb{R} \\ velocidade: \vec{v} = (x,y) \\ \text{aceleração}: \vec{a} = (x,y) \\ \text{aceleração angular}: \sigma \to \mathbb{R} \\ \text{variação de tempo}: \Delta t \to \mathbb{R} \end{cases}
```

| Γ1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    | 0 | 0 | 0 | 0 | [0 | $\lceil \Delta t \rceil$      |
|----|---|---|---|---|---|---|---|---|---|----------------------|---|---|---|---|----|-------------------------------|
| 0  | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    | 0 | 0 | 0 | 0 | 0  | $ \vec{d}_x $                 |
| 0  | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    | 0 | 0 | 0 | 0 | 0  | $ \vec{d}_y $                 |
| 0  | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    | 0 | 0 | 0 | 0 | 0  | $\mid \stackrel{g}{\mu} \mid$ |
| 0  | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0                    | 0 | 0 | 0 | 0 | 0  | $ \vec{s}_x $                 |
| 0  | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0                    | 0 | 0 | 0 | 0 | 0  | $ ec{s}_y $                   |
| 0  | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0                    | 0 | 0 | 0 | 0 | 0  | $\mid \beta \mid$             |
| 0  | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | $\frac{1}{\Delta t}$ | 0 | 0 | 0 | 0 | 0  | $ \vec{p}_x $                 |
| 0  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0                    | 0 | 0 | 0 | 0 | 0  | $ \vec{p_y} $                 |
| 0  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0                    | 0 | 0 | 0 | 0 | 0  | $\alpha$                      |
| 0  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1                    | 0 | 0 | 0 | 0 | 0  | $ \vec{v}_x $                 |
| 0  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    | 1 | 0 | 0 | 0 | 0  | $ \vec{v}_y $                 |
| 0  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    | 0 | 1 | 0 | 0 | 0  | $\mid \theta \mid$            |
| 0  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    | 0 | 0 | 1 | 0 | 0  | $ \vec{a}_x $                 |
| 0  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    | 0 | 0 | 0 | 1 | 0  | $ \vec{a}_y $                 |
| [0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    | 0 | 0 | 0 | 0 | 1  | $\lfloor \sigma \rfloor$      |