



RCAP CoSpace Autonomous Driving (Waiting)

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Waiting for a Duration

- Easy to do...
 - Line follow until see red
 - Turn left until direction is north
- ...but what about...
 - Turn right until 2 seconds?
- There's no “wait for 2 seconds” command

Waiting for a Duration

- Approach 1:
 - Set an end time
 - eg. Turn right until time is 100
 - Slightly harder to use, as time counts from beginning of program
- Approach 2:
 - Set a duration and reset the timer at each state
 - eg. Turn right until duration is 20
 - Easier to use, slightly less flexible, the GUI uses this approach

Solving it in C

- Use approach 2 (duration)
- Reset the timer at start of each state
- Increase the timer in each loop
- Create a duration function to detect when time is up
 - While we're at it, let's make duration work with seconds

Reset timer at start of state

```
int gameState = 0;

void nextState() {
    gameState++;
}
```



```
int gameState = 0;
int stateTime = 0;

void nextState() {
    gameState++;
    stateTime = 0;
}
```

Change this...

...into this

- We create a new global variable (stateTime)...
- ...and reset it to zero every time we change state

Increase the timer in each loop

```
void Game0()  
{  
  
.  
.  
.
```



```
void Game0()  
{  
    stateTime++;  
  
.  
.  
.
```

Change this...

...into this

- We add a new line to the top of “Game0()”
- “stateTime++” will increase stateTime by one each time Game0 is called

Create a duration function

```
int is_duration(float duration) {  
    if (stateTime >= (duration * 40)) {  
        return true;  
    }  
    return false;  
}
```

- There is 40 clock “ticks” per second, so we multiply duration by 40
- We compare “stateTime” with “duration * 40”, if time is up, return true, else return false

How to use?

```
if (gameState == 1) {  
    lineFollow(20);  
    if (is_purple())  
        nextState();  
}  
  
if (gameState == 2) {  
    moveForward(20);  
    if (is_duration(1))  
        nextState();  
}  
}
```

Line follow...

...until purple is detected

Move forward...

...until duration is 1 second

- Works the same as color detection

What about Approach 1?

- Works the same, except that you don't reset the timer when changing state
- Only useful if you need a timer that counts from the start of the program
 - eg. Head to the exit after 1 min, regardless of what you are doing now
- Can be useful for Cospace Rescue, not so much for Autonomous Driving

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