Lecture #6. 입력 처리

2D 게임 프로그래밍

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학습 내용

- 입력 처리 과정
- 키보드 입력 처리
- 마우스 입력 처리

키보드 및 마우스 입력 처리 과정

Step1: 입력 이벤트들을 폴링한다.(get_events())

Step2: 이벤트의 종류를 구분한다.(event.type 을 이용)

Step3: 실제 입력값을 구한다.(event.key 또는 event.x, event.y 등 을 이용)

ESC 를 이용한 종료

character_runs_esc.py


```
# 앞부분 생략

def handle_events():
    global running
    events = get_events()
    for event in events:
        if event.type == SDL_QUIT:
            running = False
        elif event.type == SDL_KEYDOWN and event.key == SDLK_ESCAPE:
            running = False

# 뒷부분 생략
```

get_events() – 발생한 모든 이벤트들을 모아서 가져옴.

```
def handle_events():

    global running

    events = get_events()

    for event in events:
        if event.type == SDL_QUIT:
            running = False
        elif event.type == SDL_KEYDOWN and event.key == SDLK_ESCAPE:
            running = False
```

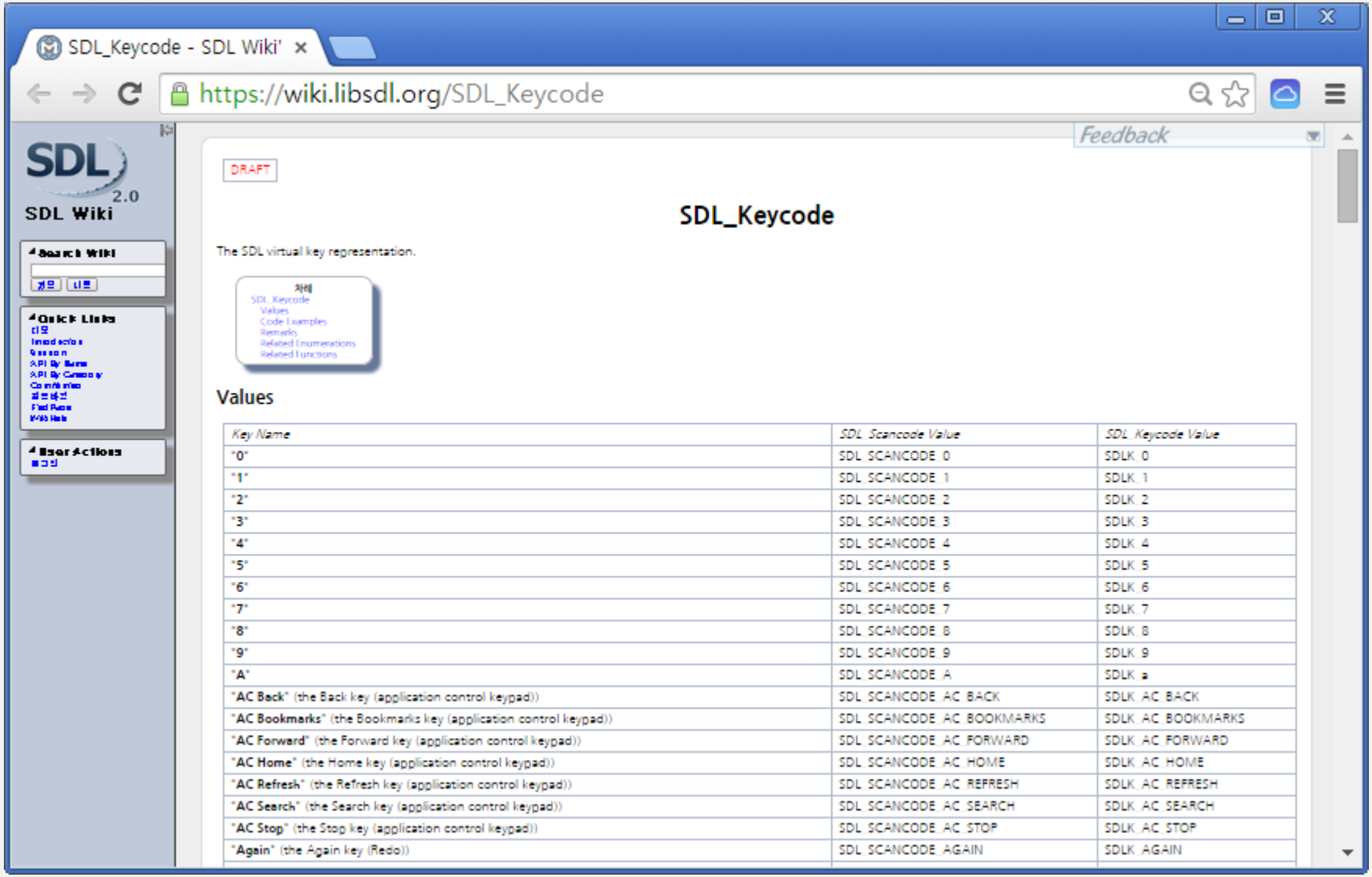
이벤트들이 담긴 리스트가 넘어옴.

이벤트를 하나씩 꺼내서 확인함.

이벤트 타입

event.type	설명
SDL_QUIT	윈도우 종료 시 발생
SDL_KEYDOWN SDL_KEYUP	키이가 눌리거나 떼어질 때 발생 event.key 에 key 값이 넘어옴
SDL_MOUSEMOTION	마우스가 움직일 때 발생 event.x, event.y 에 좌표값이 넘어옴
SDL_MOUSEBUTTONDOWN SDL_MOUSEBUTTONUP	마우스 버튼이 눌리거나 떼어질 때 발생 event.button 에 버튼의 종류(SDL_BUTTON_LEFT, SDL_BUTTON_MIDDLE, SDL_BUTTON_RIGHT)가, event.x, event.y 에 그 시점에의 마우스 좌표값(기준점,왼쪽위)이 넘어옴.

SDL 키코드(https://wiki.libsdl.org/SDL_Keycode)



Key Name	SDL Scancode Value	SDL Keycode Value
"0"	SDL_SCANCODE_0	SDLK_0
"1"	SDL_SCANCODE_1	SDLK_1
"2"	SDL_SCANCODE_2	SDLK_2
"3"	SDL_SCANCODE_3	SDLK_3
"4"	SDL_SCANCODE_4	SDLK_4
"5"	SDL_SCANCODE_5	SDLK_5
"6"	SDL_SCANCODE_6	SDLK_6
"7"	SDL_SCANCODE_7	SDLK_7
"8"	SDL_SCANCODE_8	SDLK_8
"9"	SDL_SCANCODE_9	SDLK_9
"A"	SDL_SCANCODE_A	SDLK_a
"AC Back" (the Back key (application control keypad))	SDL_SCANCODE_AC_BACK	SDLK_AC_BACK
"AC Bookmarks" (the Bookmarks key (application control keypad))	SDL_SCANCODE_AC_BOOKMARKS	SDLK_AC_BOOKMARKS
"AC Forward" (the Forward key (application control keypad))	SDL_SCANCODE_AC_FORWARD	SDLK_AC_FORWARD
"AC Home" (the Home key (application control keypad))	SDL_SCANCODE_AC_HOME	SDLK_AC_HOME
"AC Refresh" (the Refresh key (application control keypad))	SDL_SCANCODE_AC_REFRESH	SDLK_AC_REFRESH
"AC Search" (the Search key (application control keypad))	SDL_SCANCODE_AC_SEARCH	SDLK_AC_SEARCH
"AC Stop" (the Stop key (application control keypad))	SDL_SCANCODE_AC_STOP	SDLK_AC_STOP
"Again" (the Again key (Redo))	SDL_SCANCODE_AGAIN	SDLK_AGAIN

global 변수 지정

```
def handle_events():

    global running

    events = get_events()

    for event in events:
        if event.type == SDL_QUIT:
            running = False
        elif event.type == SDL_KEYDOWN and event.key == SDLK_ESCAPE:
            running = False


running = True
x = 0
frame = 0
while (x < 800 and running):
    clear_canvas()
    grass.draw(400, 30)
    ……
```

함수 내에서 값이 결정되는 변수는 지역 변수로 간주됨
따라서, global 로 사용하려면, 반드시 global 로 지정

실습

캐릭터의 좌우 이동

move_character_with_key.py


```
# 앞부분 생략

def handle_events():
    global running
    global x
    events = get_events()
    for event in events:
        if event.type == SDL_QUIT:
            running = False
        elif event.type == SDL_KEYDOWN:
            if event.key == SDLK_RIGHT:
                x = x + 10
            elif event.key == SDLK_LEFT:
                x = x - 10
            elif event.key == SDLK_ESCAPE:
                running = False

# 뒷부분 생략
```

```
def handle_events():
    global running
    global x
    events = get_events()
    for event in events:
        if event.type == SDL_QUIT:
            running = False
        elif event.type == SDL_KEYDOWN:
            if event.key == SDLK_RIGHT:
                x = x + 10
            elif event.key == SDLK_LEFT:
                x = x - 10
            elif event.key == SDLK_ESCAPE:
                running = False

open_canvas()
grass = load_image('grass.png')
character = load_image('run_animation.png')

running = True
x = 800 // 2
```

좌우 키가 눌리면, x값을 증가 또는 감소

좌우 이동 추가 구현


```
def handle_events():
    global running
    global dir

    events = get_events()
    for event in events:
        if event.type == SDL_QUIT:
            running = False
        elif event.type == SDL_KEYDOWN:
            if event.key == SDLK_RIGHT:
                dir += 1
            elif event.key == SDLK_LEFT:
                dir -= 1
            elif event.key == SDLK_ESCAPE:
                running = False
        elif event.type == SDL_KEYUP:
            if event.key == SDLK_RIGHT:
                dir -= 1
            elif event.key == SDLK_LEFT:
                dir += 1
```


```
running = True
x = 800 // 2
frame = 0
dir = 0

while running:
    clear_canvas()
    grass.draw(400, 30)
    character.clip_draw(frame * 100, 0, 100, 100, x, 90)
    update_canvas()
    handle_events()
    frame = (frame + 1) % 8
    x += dir * 5
    delay(0.05)
```

변수 dir 을 이용하여, x 축상의 방향을 표시.

실습

마우스를 이용한 캐릭터 이동

move_character_with_mouse.py


```
# 앞부분 생략

KPU_WIDTH, KPU_HEIGHT = 1280, 1024

def handle_events():
    global running
    global x, y
    events = get_events()
    for event in events:
        if event.type == SDL_QUIT:
            running = False
        elif event.type == SDL_MOUSEMOTION:
            x, y = event.x, KPU_HEIGHT - 1 - event.y
        elif event.type == SDL_KEYDOWN and event.key == SDLK_ESCAPE:
            running = False

open_canvas(KPU_WIDTH, KPU_HEIGHT)
kpu_ground = load_image('KPU_GROUND.png')
character = load_image('run_animation.png')
# 뒷부분 생략
```

마우스 좌표의 획득과 변환

```
        if event.type == SDL_QUIT:
            running = False
        elif event.type == SDL_MOUSEMOTION:
            x, y = event.x, KPU_HEIGHT - 1 - event.y
        elif event.type == SDL_KEYDOWN and event.key == SDLK_ESCAPE:
            running = False
```

마우스가 이동하면, SDL_MOUSEMOTION 이벤트가 발생

event.x 및 y는, 윈도우 API 의 좌표계를 따름.

pico2d 좌표계 변환 필요.

show_cursor(), hide_cursor()

```
running = True
x, y = KPU_WIDTH // 2, KPU_HEIGHT // 2
frame = 0
hide_cursor()

while running:
    clear_canvas()
    kpu_ground.draw(KPU_WIDTH // 2, KPU_HEIGHT // 2)
    character.clip_draw(frame * 100, 0, 100, 100, x, y)
    update_canvas()
    frame = (frame + 1) % 8

    delay(0.02)
    handle_events()
```