

# CSE 4300 Final Project: Plane Game I

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Technology used

THE  
C

PROGRAMMING  
LANGUAGE



# Source file tree & Lessons learned in organization

```
typedef struct {
    void (*logic)(void);
    void (*draw)(void);
} Delegate;

typedef struct {
    SDL_Renderer* renderer;
    SDL_Window* window;
    Delegate delegate;
    int keyboard[MAX_KEYBOARD_KEYS];
} App;

typedef struct Entity Entity;

struct Entity {
    float x;
    float y;
    int w;
    int h;
    float angle;
    float dx;
    float dy;
    int health;
    int reload;
    int side;
    int e_type;
    SDL_Texture* texture[8];
    Entity* next;
};

typedef struct {
    Entity fighterHead, *fighterTail;
    Entity bulletHead, *bulletTail;
} Stage;
```



▼ src

- /\* common.h
- /\* defs.h
- /\* draw.c
- /\* draw.h
- /\* init.c
- /\* init.h
- /\* input.c
- /\* input.h
- /\* main.c
- /\* main.h
- /\* stage.c
- /\* stage.h
- /\* structs.h
- /\* util.c
- /\* util.h
- /\* makefile

# Main game loop:

Atexit is nice

Try to minimize the spaghetti  
with a “delegate”

Easy frame rate with library timer!



```
int main(int argc, char* argv[]) {  
  
    long then;  
    float remainder;  
  
    memset(&app, 0, sizeof(App));  
  
    initSDL();  
    atexit(cleanup);  
  
    initStage();  
  
    then = SDL_GetTicks();  
    remainder = 0;  
  
    while(1) {  
        prepareScene();  
  
        doInput();  
  
        app.delegate.logic();  
        app.delegate.draw();  
  
        presentScene();  
  
        capFrameRate(&then, &remainder);  
    }  
    return 0;  
}
```

Logic and draw call other atomic functions

```
static void logic(void) {  
    doPlayer();  
  
    doEnemies();  
  
    doFighters();  
  
    doBullets();  
  
    spawnEnemies();  
  
    clipPlayer();  
  
    if (player == NULL && --stageResetTimer <= 0) {  
        resetStage();  
    }  
}
```

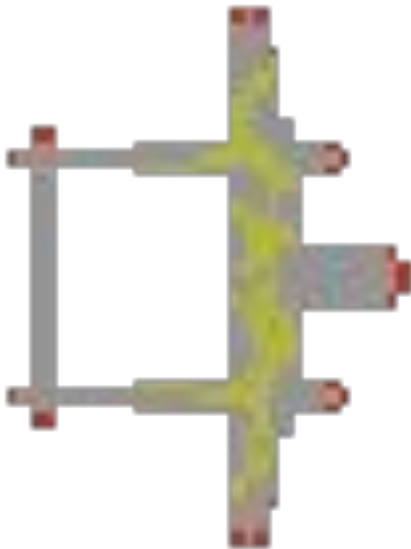
```
static void draw(void) {  
    drawFighters();  
    drawBullets();  
}
```

# doPlayer()

The first function  
called by logic  
Function pointer  
Can see throttle  
and turn “tank”  
controls

```
static void doPlayer(void) {  
    if (player != NULL) {  
        //player->dx = player->dy = 0;  
  
        if (player->reload > 0) {  
            player->reload--;  
        }  
        player->dy = sin(player->angle)*PLAYER_SPEED;  
        player->dx = cos(player->angle)*PLAYER_SPEED;  
  
        if (app.keyboard[SDL_SCANCODE_UP]) {  
            player->dy += 0.5*sin(player->angle)*PLAYER_SPEED;  
            player->dx += 0.5*cos(player->angle)*PLAYER_SPEED;  
        }  
        if (app.keyboard[SDL_SCANCODE_DOWN]) {  
            player->dy -= 0.5*sin(player->angle)*PLAYER_SPEED;  
            player->dx -= 0.5*cos(player->angle)*PLAYER_SPEED;  
        }  
        if (app.keyboard[SDL_SCANCODE_RIGHT]) {  
            player->angle+=0.025;  
            //player->dx = PLAYER_SPEED;  
        }  
        if (app.keyboard[SDL_SCANCODE_LEFT]) {  
            player->angle-=0.025;  
            //player->dx = -PLAYER_SPEED;  
        }  
        if (app.keyboard[SDL_SCANCODE_SPACE] && player->reload == 0) {  
            fireBullet();  
        }  
        if (player->angle > 2*PI) {  
            player->angle-=2*PI;  
        }  
        if (player->angle < 0) {  
            player->angle+=2*PI;  
        }  
    }  
}
```

I am bad at art



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Let's do a demo and take questions about code

