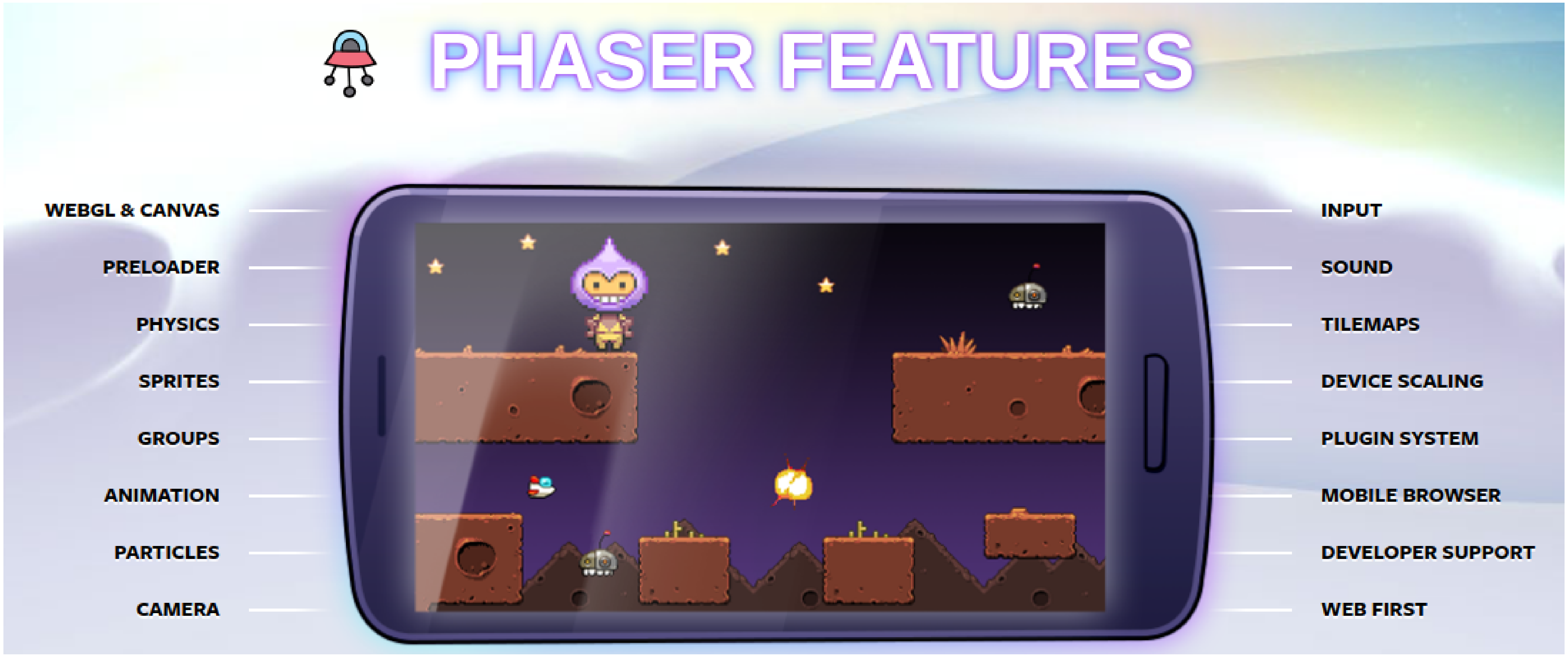
https://phaser.io/

PHASER
HTML 5
Desktop and Mobile HTML5 game framework
A fast, free and fun open source framework for Canvas and WebGL powered browser games.
DOWNLOAD & GET STARTED
Download or Fork via Github
3.3.0

Phaser 3.3.0 "Tetsuo" is the current stable version and was released on 22nd March 2018.

PHAS3R


PHASER FEATURES
WEBGL & CANVAS
PRELOADER
PHYSICS
SPRITES
GROUPS
ANIMATION
PARTICLES
CAMERA
INPUT
SOUND
TILEMAPS
DEVICE SCALING
PLUGIN SYSTEM
MOBILE BROWSER
DEVELOPER SUPPORT
WEB FIRST

Phaser 3 is available via GitHub, npm and CDNs

- <script src="//cdn.jsdelivr.net/npm/phaser@3.3.0/dist/phaser.js"></script>
- <script src="//cdn.jsdelivr.net/npm/phaser@3.3.0/dist/phaser.min.js"></script>

Dowload js:

- https://phaser.io/download/stable

Github:

- https://github.com/photonstorm/phaser/tree/v3.3.0

npm

- npm install phaser@3.3.0

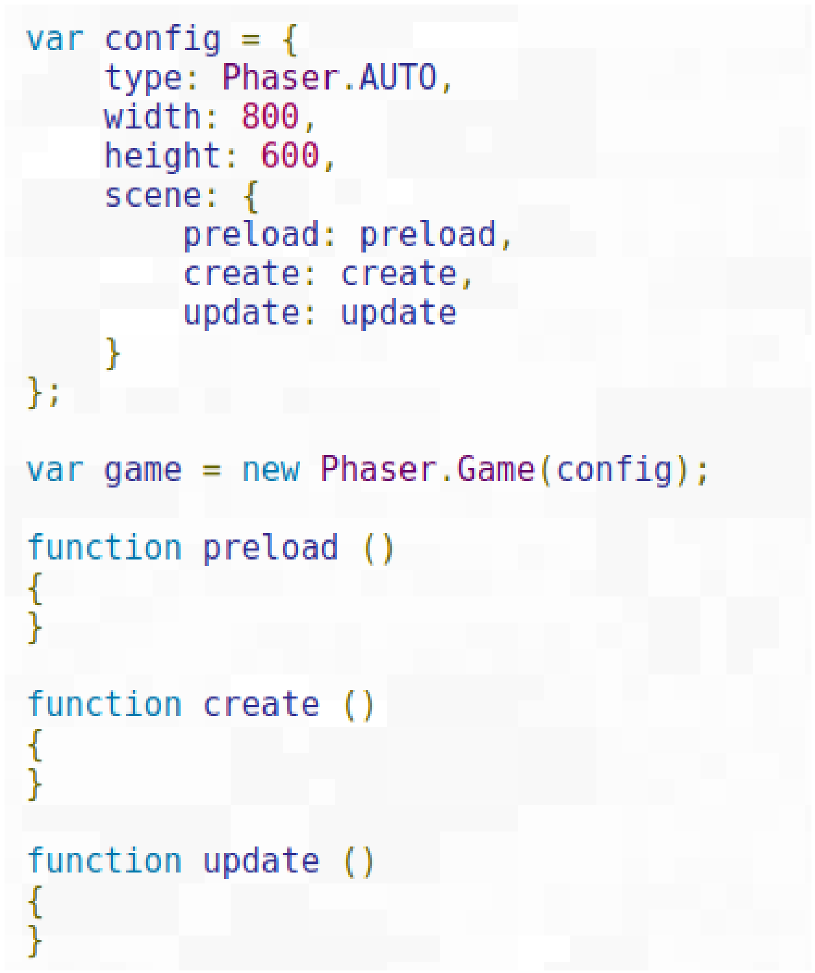
Phaser 3 API Documentation can currently be found here:

- https://phaser.io/phaser3/api/components

Examples:

- http://labs.phaser.io/index.html
- https://github.com/photonstorm/phaser3-examples
- https://phaser.io/tutorials/making-your-first-phaser-3-game
- https://stackoverflow.com/questions/tagged/phaser-framework

Authors Note: Not all examples work, sorry! We're tidying them up as fast as we can.



```
var config = {
    type: Phaser.AUTO,
    width: 800,
    height: 600,
    scene: {
        preload: preload,
        create: create,
        update: update
    }
};

var game = new Phaser.Game(config);

function preload ()
{
}

function create ()
{
}

function update ()
{
}
```

config object: configure your Phaser Game

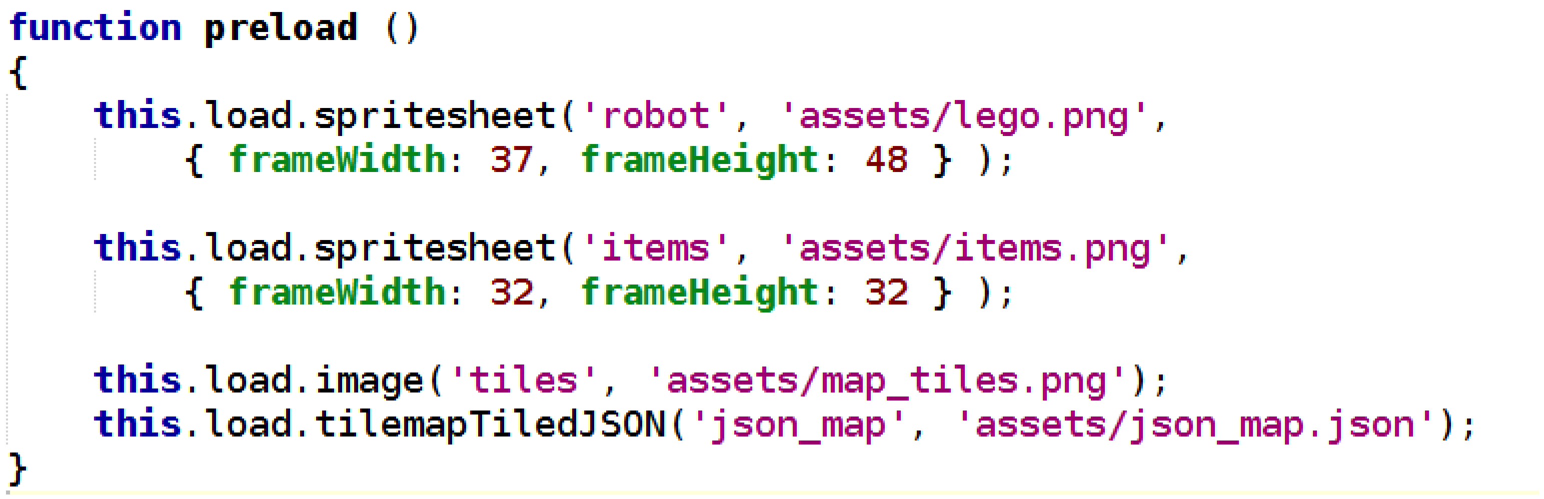
- WebGL or Canvas
- game width
- game height
- created scene

game object: instance of a Phaser.Game

- the configuration object is passed to it

life-cycle:

- init
- preload
- create
- update

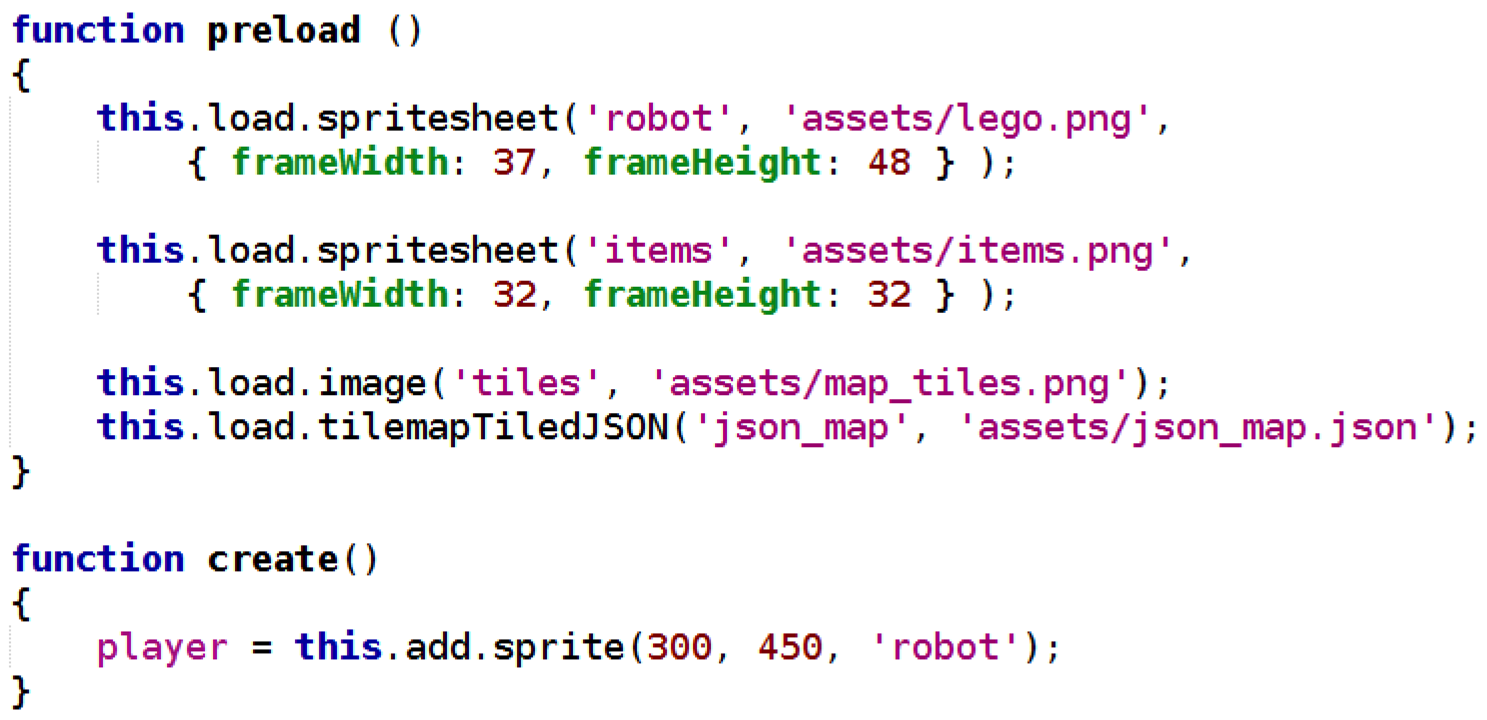


```
function preload ()
{
    this.load.spritesheet('robot', 'assets/lego.png',
        { frameWidth: 37, frameHeight: 48 } );

    this.load.spritesheet('items', 'assets/items.png',
        { frameWidth: 32, frameHeight: 32 } );

    this.load.image('tiles', 'assets/map_tiles.png');
    this.load.tilemapTiledJSON('json_map', 'assets/json_map.json');
}
```

- Phaser will automatically look for this function when it starts and load anything defined within it - Phaser loads images and assets into memory before launching the game

- this example will load in 4 assets (1x image, 2x spritesheets, 1x tilemap)

- the first parameter represents the **asset key** - link to the loaded asset



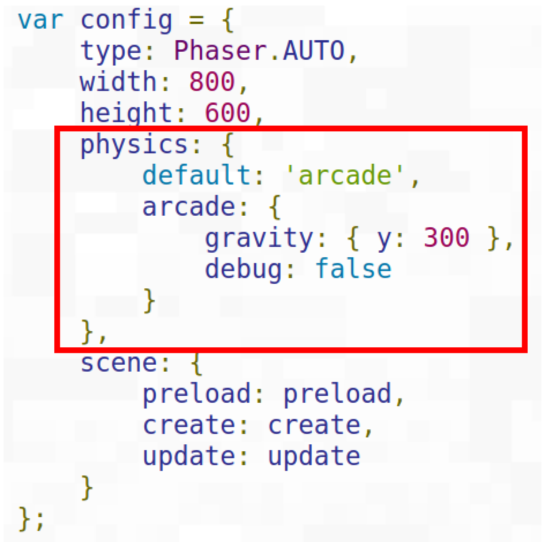
```
function preload ()
{
    this.load.spritesheet('robot', 'assets/lego.png',
        { frameWidth: 37, frameHeight: 48 } );

    this.load.spritesheet('items', 'assets/items.png',
        { frameWidth: 32, frameHeight: 32 } );

    this.load.image('tiles', 'assets/map_tiles.png');
    this.load.tilemapTiledJSON('json_map', 'assets/json_map.json');
}

function create()
{
    player = this.add.sprite(300, 450, 'robot');
}
```

- after preloading phase, the **create** method is executed - place to create entities for your game (player, enemies, etc)

- **asset key** – is used when creating Game Objects

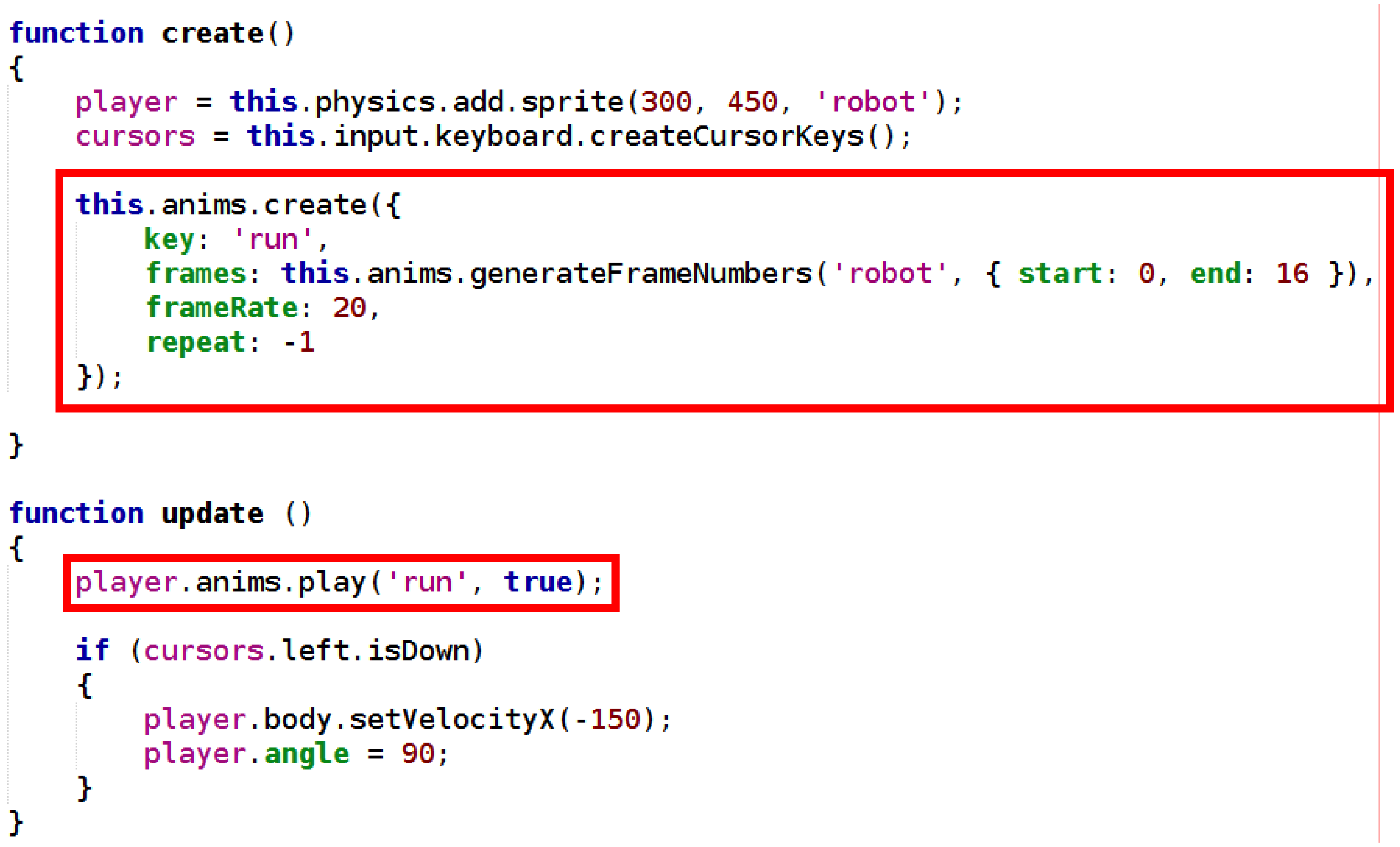
- the values 300 and 450 are the x and y coordinates of the sprite

```
function create()
{
    player = this.physics.add.sprite(300, 450, 'robot');
    cursors = this.input.keyboard.createCursorKeys();

    this.anims.create({
        key: 'run',
        frames: this.anims.generateFrameNumbers('robot', { start: 0, end: 16 }),
        frameRate: 20,
        repeat: -1
    });

}

function update ()
{
    player.anims.play('run', true);

    if (cursors.left.isDown)
    {
        player.body.setVelocityX(-150);
        player.angle = 90;
    }
}
```

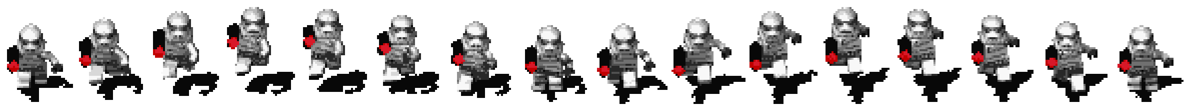


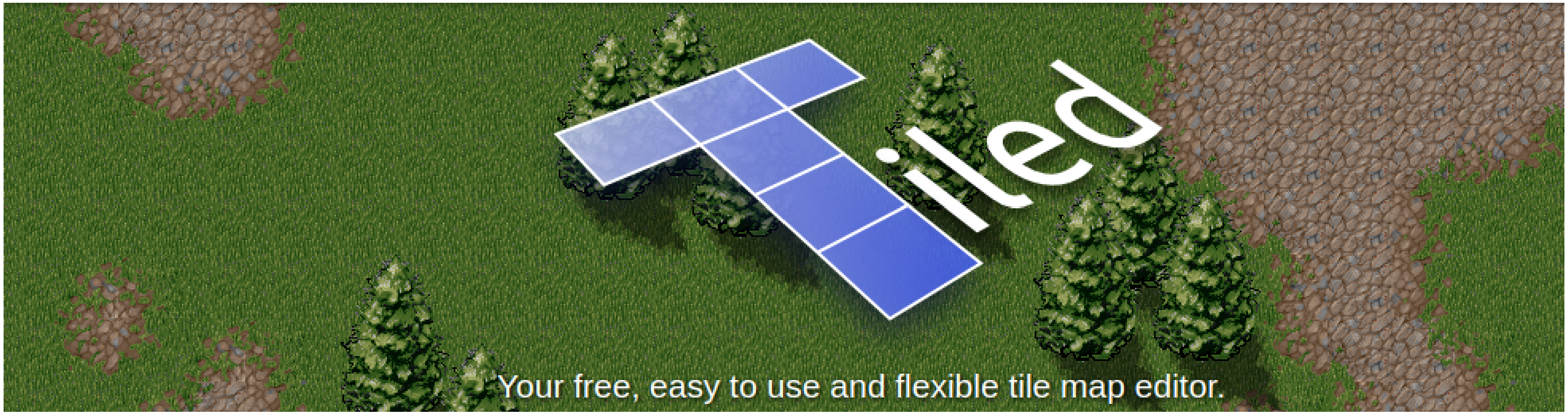
```
var config = {
    type: Phaser.AUTO,
    width: 800,
    height: 600,
    physics: {
        default: 'arcade',
        arcade: {
            gravity: { y: 300 },
            debug: false
        }
    },
    scene: {
        preload: preload,
        create: create,
        update: update
    }
};
```

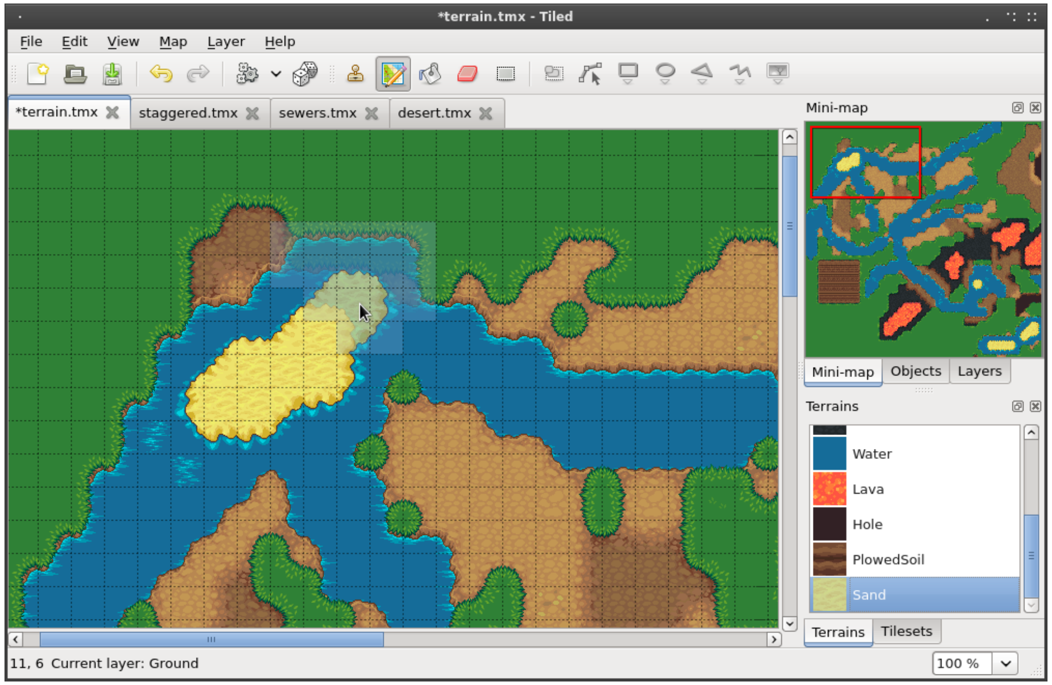
- scene is running - the **update** method is executed multiple times per second
- to use **arcade physics** system, we need to add it to our game config

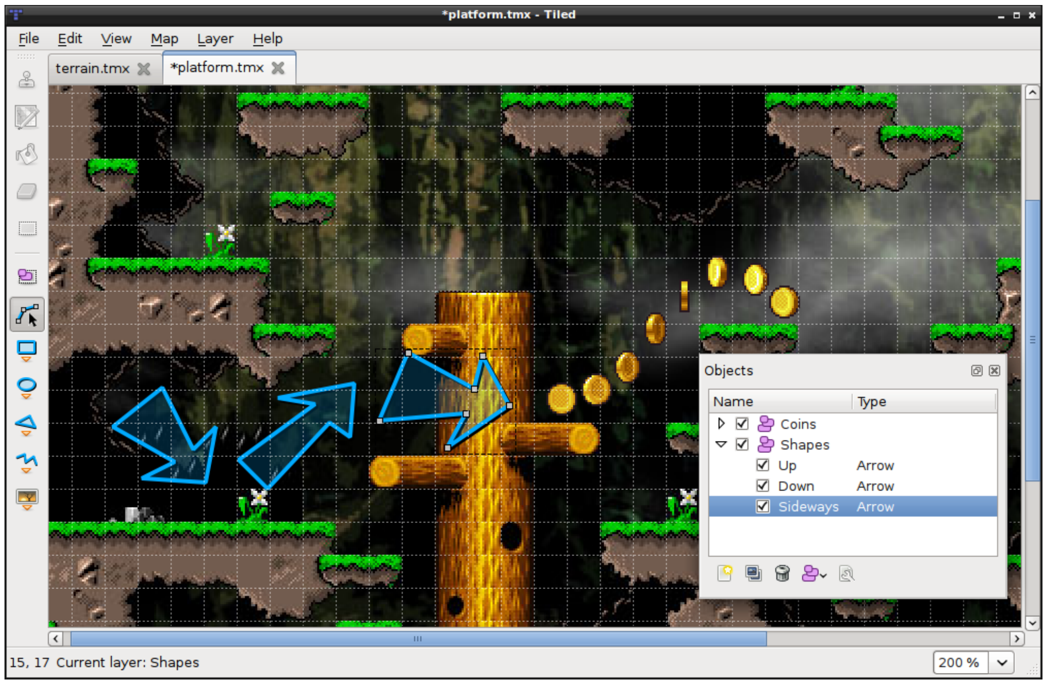


```
function create()
{
    player = this.physics.add.sprite(300, 450, 'robot');
    cursors = this.input.keyboard.createCursorKeys();

    this.anims.create({
        key: 'run',
        frames: this.anims.generateFrameNumbers('robot', { start: 0, end: 16 }),
        frameRate: 20,
        repeat: -1
    });

}

function update ()
{
    player.anims.play('run', true);

    if (cursors.left.isDown)
    {
        player.body.setVelocityX(-150);
        player.angle = 90;
    }
}
```

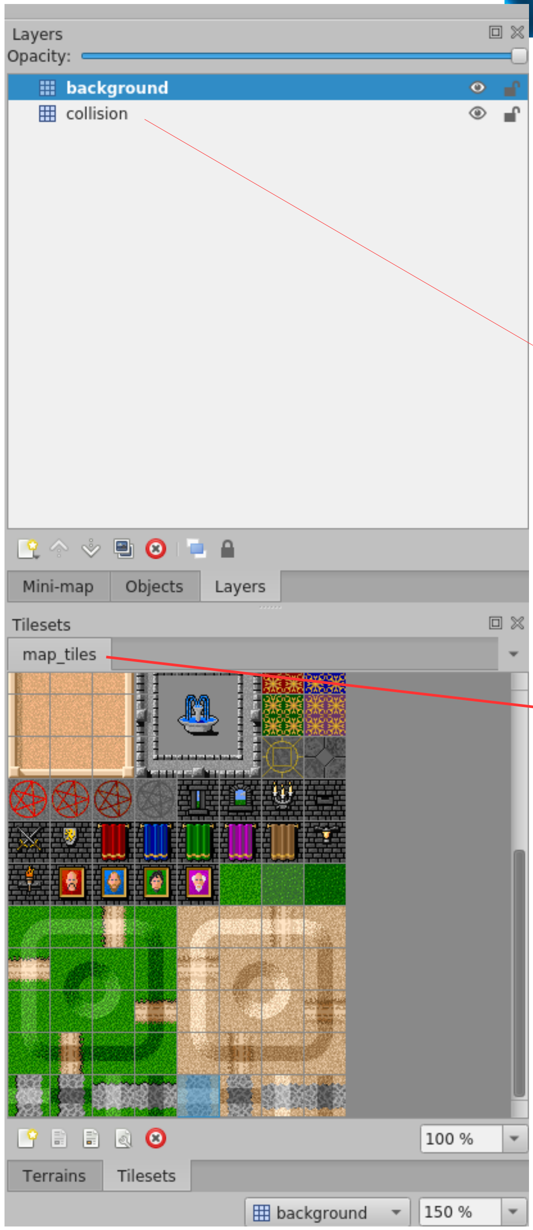
- Animation - 
- Robot is loaded (in **preload** function) as a sprite sheet - because it contains animation frames







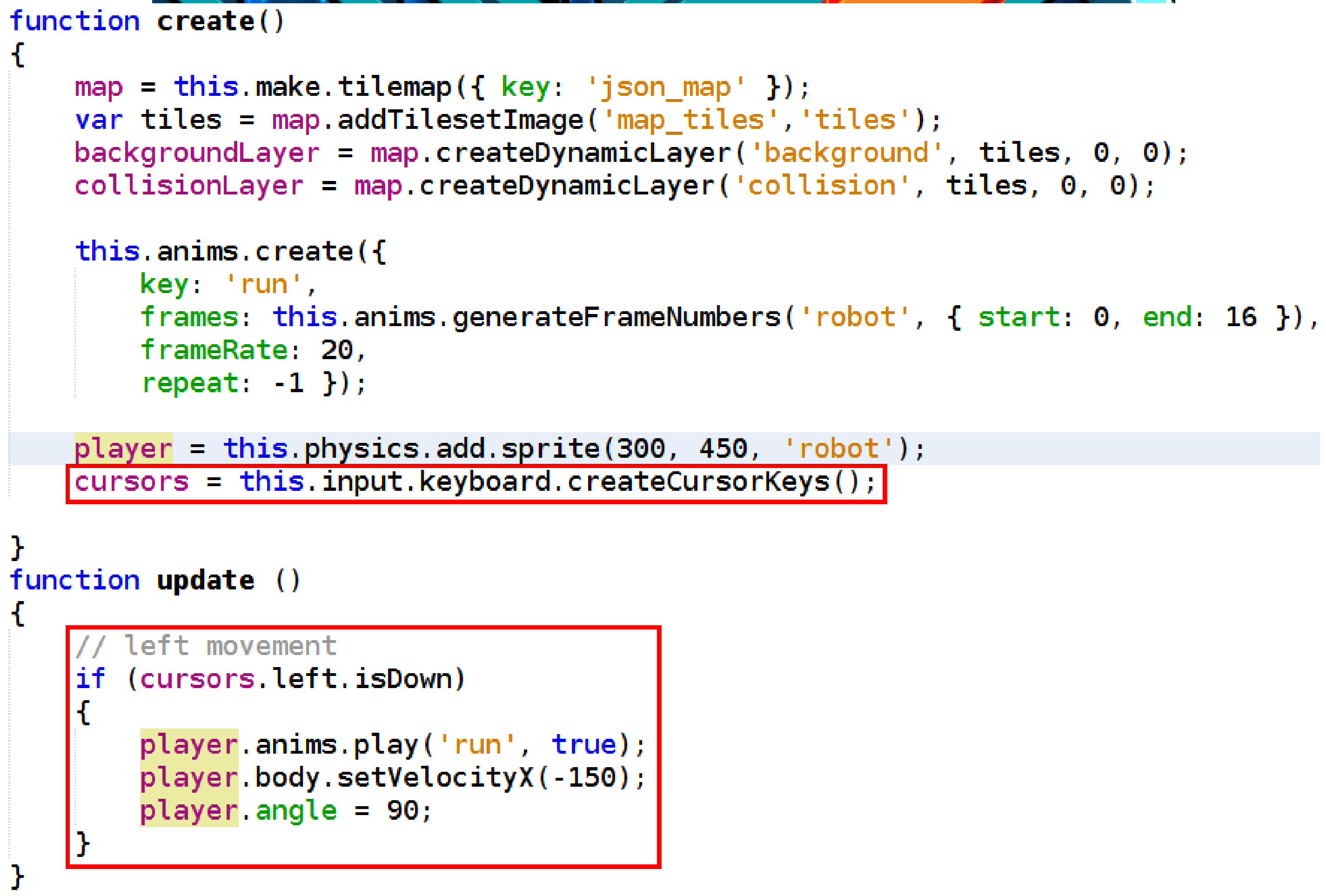
http://www.mapeditor.org/ "Tiled is a 2D level editor that helps you develop the content of your game. Its primary feature is to edit tile maps of various forms, but it also supports free image placement as well as powerful ways to annotate your level with extra information used by the game. Tiled focuses on general flexibility while trying to stay intuitive." - http://doc.mapeditor.org/en/latest/manual/introduction/#about-tiled



```
function preload ()
{
    this.load.spritesheet('robot', 'assets/lego.png',
        { frameWidth: 37, frameHeight: 48 } );

    this.load.spritesheet('items', 'assets/items.png',
        { frameWidth: 32, frameHeight: 32 } );

    this.load.image('tiles', 'assets/map_tiles.png');
    this.load.tilemapTiledJSON('json_map', 'assets/json_map.json');
}

function create()
{
    map = this.make.tilemap({ key: 'json_map' });
    //'map_tiles' - name of the tilesets in json_map.json
    //'tiles' - name of the image in load.images()
    var tiles = map.addTilesetImage('map_tiles', 'tiles');

    backgroundLayer = map.createDynamicLayer('background', tiles, 0, 0);
    collisionLayer = map.createDynamicLayer('collision', tiles, 0, 0);

}
```

- We can create a map with static or dynamic layers from a JSON file

https://labs.phaser.io/index.html?dir=game%20objects/tilemap/



```
function create()
{
    map = this.make.tilemap({ key: 'json_map' });
    var tiles = map.addTilesetImage('map_tiles','tiles');
    backgroundLayer = map.createDynamicLayer('background', tiles, 0, 0);
    collisionLayer = map.createDynamicLayer('collision', tiles, 0, 0);

    this.anims.create({
        key: 'run',
        frames: this.anims.generateFrameNumbers('robot', { start: 0, end: 16 }),
        frameRate: 20,
        repeat: -1 });

    player = this.physics.add.sprite(300, 450, 'robot');
    cursors = this.input.keyboard.createCursorKeys();

}
function update ()
{
    // left movement
    if (cursors.left.isDown)
    {
        player.anims.play('run', true);
        player.body.setVelocityX(-150);
        player.angle = 90;
    }
}
```

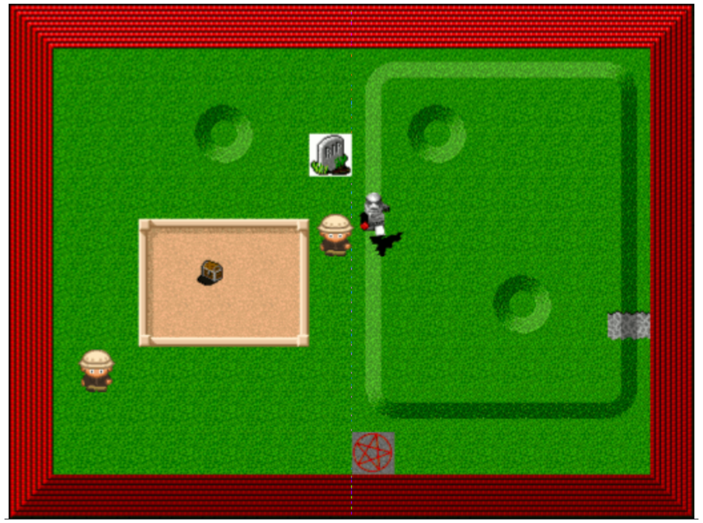
- Phaser has a built-in Keyboard manager
  - properties: up, down, left, right
- if the left key is being held down → negative horizontal velocity + animation

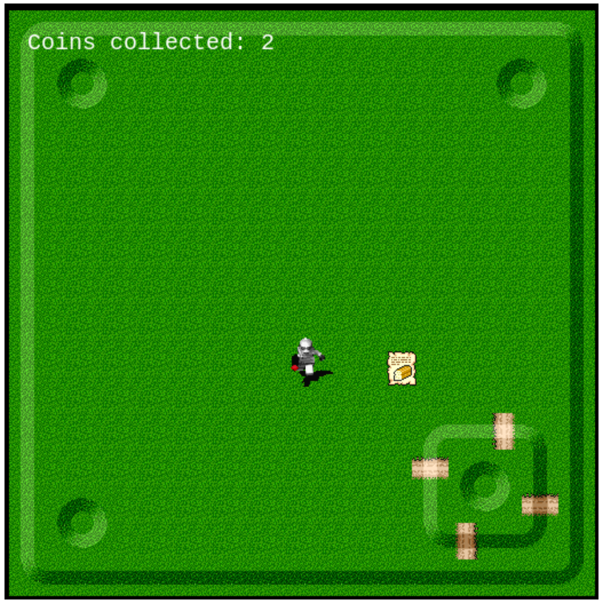
Collision example (experiment with the options):

```
//Sets collision on all tiles in the given layer,
//except for the IDs of those in the given array
collisionLayer.setCollisionByExclusion([ -1 ]);
//collisionLayer.setCollision();
//collisionLayer.setCollisionByIndex();
//collisionLayer.setCollisionBetween();
// We want the player to physically collide with the collisionLayer,
// but the backgroundLayer layer should only trigger an overlap
this.physics.add.collider(player, collisionLayer);
this.physics.add.overlap(player, backgroundLayer);

//Checks to see if the player overlaps with any of the items,
//if he does call the collisionHandler function
this.physics.add.overlap(player, items, collisionHandler);

function collisionHandler (player, item) {
    updateText();
    item.disableBody(true, true);
    if (item.body.enable == false)
    {
        //new random location
        item.setFrame(itemID);
        item.enableBody(true, itemX, itemY, true, true);
    }
}
```

Task (1-2pt)

- During the lab, we will show, how to move the player, center the screen on it and detect collisions with walls.
- **Continue with the game example.**
  - Experiment with the mapeditor, player animation, collision system, etc
- The task is to make the player collect items which will be randomly displayed over the map and show actual score
- Additional point will be awarded if the player has several enemies which it has to avoid (otherwise the score is reset)




Coins collected: 2