③ Interactive Mario Platformer

★ Things we'll learn

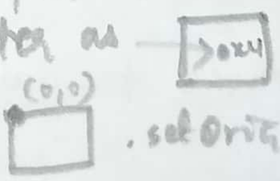
- Physics concepts — jumps, bounce, Gravity, speed
- keyboard controls
- Animatⁿ
- tweens (+ movⁿ bckgrnd} using arrays ds)
- Camera control (ie our screen goes whre the player moves)
- Groups logic
- Collision & Overlap

How to create land / series of tiles using one singele img:

Tiles →

```
function preload(){
    this.load.image("ground", "../Assets/..");
    this.load.image("sky", " _ ");
}
```

bydefault we have img center as → & to mk it .setOrig_(0,0)



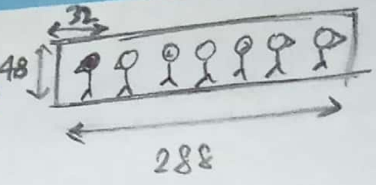
```
function create(){
    W= game.config.width;
    H = game.config.height;

    let background = this.add.sprite(0,0,"sky");
    background.setOrigin (0,0);
    bagroud.displayWidth = W;

                         tileSprite
    let ground = this.add.~~sprite~~ (0, H-128, W, 128, "ground");
    ground.setOrigin (0,0);
}
```

m#1 → mtlb 'W' tk streach kro

W → jaha tk lejana hai img ko ①

m ~~to~~ 2 → 128 → height of the area jisme img fill krni hai.

How to load of player



} spritesheet

```
funcⁿ preload(){
    this.load.spritesheet("dude","dude.png",{framewidth: 32,
                                              frameheight: 48});
```

each frame ki W & H kya hogi

Add physics concepts in the game :

```
let config = {
    :
    physics : {
        default: "arcade";
        arcade: {
            gravity: {
                y: 1000,   → this val. of grav. works fine.
            },
        }
          in 'arcade'
          debug: true,   → this shows the bounding boxes
                           around all the objs on the screen.
          (purple/pink lines reflect dynamic bodies
          & blue ones static ")
    },
    :
}
```

green line shows the directⁿ, larger the magnitude & velocity longer will be the green line.

Addⁿ physics to players :

with "true" makes the img static, that is imovable else all imgs by-default are dynamic.

```
fn create(){
    :
    let player= this.physics.add.sprite(100,100, "dude", 4);

this.physics.add.existing(ground, true); → existⁿ img pe physics lagana
//ground.body.allowGravity =false; → if "true", this img will also fall
//ground.body.imovavable = true; → irrespective of colisⁿ this img won't move

this.physics.add.collider(ground, player); → colisⁿ detectⁿ b/w these 2 imgs
```

(→ mtlb player ground se colid hoga then ground pe rest state pe a jaega.

dynamic
a group of objcts:

```
fn create(){
    :
    let fruits = this.physics.add.group ({
        key: "apple",          → jis img ka grp banana hai
        repeat : 8,            → no. of imgs in grp
        setScale : { x:0.2 , y:0.2 },   → original img ka 20% ho ja
        setXY : { x: 10, y: 0, stepX:100 },
    });                        ↳ for every repeatatn 'x' cord. will
                                 shift by 100.
    :
}
```

m#1 to create attributes

Add Bounce effct on objcts

```
fn create(){
    :
    this.player.setBounce ( 0.2);

    fruits.children.iterate( function (f){
        f.setBounce( Phaser.Math.FloatBetween(0.4, 0.8));
    })
    :
}
```

when set to 1, it'll mean that on every collisn there will be no energy loss ∴ it'll keep on bouncing. if $x<1$, x will mean there'll be loss of energy.

for every objct of fruit iterate

for every objct we'll have dif value of bounce.

Add a static group of objs

```
fn create(){
    :
    let platforms = this.physics.add.staticGroup();
    platforms.create (600,400,"ground").setScale (2, 0.5).refreshBody();
        — " — 700,200 — " —
        — " — 100, 200 — " —

    platforms.add(ground);
}
```

m#2 to add or create attributes

2 → to ↑se width 2 times

0.5 → ↓se height by half.

↳ Now as we've reshaped the img, its boundary have also changed, in order to set its new boundary acc. to new scales, we use 'refreshBody()'.

↳ to add 'ground' in platforms container.

To check which key on keyboard is pressed:

(1) fn create() {
```
        :
    this.cursors = this.input.keyboard.createCursorKeys();
        :
}
```

(2) Now in update() fn we'll check which is presd:

```
fn update(){
    if (this.cursors.left.isDown) {        → it mean when down arow
                                              key is presd.
        this.player.setVelocityX( -player_config.player_speed);
    }
    else if (this.cursor.right.isDown){
        this.player.setVelocityX(player_config.player_speed);
    }
    else {
        this.player.setVelocity(0);
    }
                                  player img jo hai that is
                                  touch down ie is not in air.
                                  or img is touch" top of another img.
    if(this.~~pl~~cursors.up.isDown && this.player.body.touching.){ → down
        this.player.setVelocityY(player_config.player_jumpspeed);
    }
}
```

→ In main body we create an obj for player

```
let player_config = {
        player_speed : 150,
        player_jumpspeed : -700,
}
```

Add^n Animat^n

fn create(){
    ⋮

    this.anims.create({   JSON obj^ct

when this anim. is called or trigrd — key: "left",

kaha se kaha tak frames chalni chahie — frames: this.anims.generateFrameNumbers("dude", {start:0, end: 3}),

    frameRate: 10; → per second kitni frames dikhani

    repeat: -1, → repeat for ∞ time

    });

like this we'll create for "right" & "center" facing.
for "right = {start: 5, end: 8}" & "center = {st: 4, e: 4}".

-Now in update just called this animat^n, whn left key is prsd call "left" anim, similarly for right & center.

ex
```
fn update(){
    ⋮
    if (←){
        ⋮
        this.player.anims.play("left", true);
    }
    ⋮
}
```

OVERLAP: ie whn playr eats/overlaps fruit.

```
fn create(){
    ⋮
    this.physics.add.overlap(this.player, fruits, eatfruit, null, this);
    ⋮
}
```

eatfruit → trigrs this fn() whn 1st para img/obj and 2nd para im/obj overlaps; colide callback fn() call

null → for aditional checks. [not needed!]

this → context in which to run the callback fn.

```
function eatfruit(player, fruit){
    fruit.disableBody(true, true);
}
```

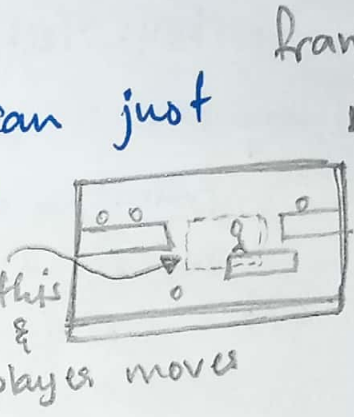
1st true → disableGameObject — deactivate game object

2nd true → hideGameObject — only hides the object.

Check that player doesn't go out of frame:

```
fn create(){
      :
   this.player.setCollideWorldBounds(true);
   :
}
```

Instead of showing the whole frame, we can just zoom our screen towards the player: (CAMERA)



```
fn create(){
      :
   this.cameras.main.setBounds(0,0,w,H);      -> dimensions of camera screen.
 //this.physics.world.setBounds(0,0,w,H);

   this.cameras.main.startFollow(this.player, true, true);  -> to tell camera whom to focus on.
   this.cameras.main.setZoom(1.5);   -> kitna zoom karna.
   :
}
```

Add^n tweens for sunrays

```
fn create(){
      :
   let rays = []
   for(let i=-10, i<=10, i++){
     let ray = this.add.sprite(w/2, H-100,"ray");
     ~~ray.displaywidth~~
     ray.displayHeight = 1.2 * H;
     ray.setOrigin(0.5,1);
     ray.alpha = 0.2;
     ray.~~depth~~angle = i*20;
     rays.push(ray);
   }
```

```
this.tweens.add({
   targets: rays,
   props: {
      angle:{
         value: "+=20",
      },
   },
   duration: 8000,
   repeat: -1,
});
```