**WEEK 3**

**REPORT**

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| **Kelas** | TI-3G |
| Asset yang dipakai (sertakan screenshoot, jika terdapat asset yang digunakan berasal dari internet atau sumber lain, cantumkan link) |  |

**STEPS**

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| 1. **Flipping Sprite Horizontally** | |
|  | Create a new 2D Unity project. |
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|  | Import EnemyBug.png to your project. |
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|  | Drag Enemy Bug to scene. Set the position (x,y,z) of this GameObject to (0, 0, 0) then set the scale to (2, 2, 2). |
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|  | Create a new C# script named BugFlip with this following code, then add this code to be component of GameObject Enemy Bug |
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|  | Run your project. Try to push your left or right arrow button on your keyboard, then you will see that the GameObject will change the direction based on which button is pressed. |
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|  | Save your scene. |

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| 1. **Animation for body parts when caharacter is moving**   In this activity, we will learn about making an animation for boyd parts when a character is moving. It useful to make your character be more realistic. To do this, lets follow this some instructions: | |
|  | Create a new 2D Unity project. |
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|  | Import asset from PotatoMan2Dassets folder |
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|  | Set the size of Main Camera to 10. |
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|  | Your scene will look bigge |
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|  | Set 2D gravity by Edit | Project Settings | Physics 2D, then set Y value to -30. |
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|  | Drag character2D to scene. Set position (x,y,z) of GameObject to (0, 3, 0) |
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|  | Drag sprite platformWallBlocks from Project | Sprites to scene. Set position of GameObject to (0, -4, 0). |
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|  | Add Box Collider 2D component to platformWallBlocks by Add Component | Physics 2D | Box Collider 2D. |
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|  | Change the layer of platformWallBlocks by Add layer the fill the column with value: Ground |
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|  | Back to platformWallBlocks in hierarchy, then select Ground layer. |
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|  | Select character2D in Hierarchy, then open Animation panel by Window | Animation, click Create button. Save the animation named Character2D in folder of Character2D | Animation. |
|  | Click dropdown menu in Animation panel, then click item menu [Create New Clip]. |
|  | Save your new clip in Character2D | Animation, name it to be character- beanman-idle. In this stepm you have created an Animation clip for 'idle' character state (unmove). |
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|  | Look at Character2D | Animation folder in Project panel, it should be 2 files: 1) Animation clip (character-beanman-idle) and 2) Animator controller from character2D (character2D). Note : Delete character2D clip because we don’t need this file anymore. |
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|  | Select character2D in Hierarchy, open Animator panel (Window | Animator). You will see some State Machines to control animation from character. In this step, it has just one Animation clip (character-beanman-idle), so add clip character-beanman-idle at entry State Machine. Right click on Entry then select Set StateMachine Default State, direct it to clip character-beanman-idle. |
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|  | Run your project, you will see a character which is on 'idle' state, you can not move your character until you create another clip. Note: the character will drop to down because the garvity value is 1 in RigidBody 2D. The character will stop at platformWoodBlocks because they have Box Cllider 2D. |
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|  | To create 'jump' Animation clip for hat animation, click the empty dropdown menu in Animation panel, then create a new clip at character-beanman-jump save in Animation folder |
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|  | Click Add Property button, then select Transform | Position as hat child object by click '+' plus-sign button. In this step, we will do a recording of position (X, Y, Z) at GameObject hat in clip animation. |
|  | Look at 2 'keyframes' at 0.0 and at 1.0. It shown as diamonds in Timeline area at the right side of Animation panel. |
|  | Select the first keyframe at (0,0) then in the Scene panel change the hat position to be upper left side position away from the head. Look at X,Y,Z value in inspector, the red background shows that any changes in Transform component is recorded in animation clip. |
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|  | Because 1 second is too long for jump animation, drag the second keyframe to 0.5 |
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|  | In Animator panel, select character-beanman-idle then make transition to state character-beanman-jump by right clicking and select Make Transition, then drag transition arrow to state character- beanman-jump. |
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|  | Add Trigger parameter named ‘Jump’ by clicking add parameter plus-sign "+" at the upper left side of Animator panel, select Trigger then name Jump. |
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|  | Make sure that PlayerControl script has been added to GameObject character2D |
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|  | In Animator Panel, set properties to determine when the character to make Transition from idle to jump by click Transition arrow, then change these 4 following things in Inspector panel, such:  a. Has Exit Time: uncheck  b. Transition Duration: 0.01  c. Interruption State: Current State  d. Conditions: Add Jump (click plus-sign '+' button at bottom) |
|  | Run your project. When character landed, press space key to jump, you will see that the hat jumped away from the character’s head from, then be back slowly. In this step, we haven’t create a transition to move from Jump state so the Animation clip will perform repeatedly (hat will always move away althoug the jumping activity has been stopped). |
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| 1. 3-Frame Animation Clip To Make Animation Runs Repeatedly | |
|  | Continuing our second activity, create a new scene with different name from previous scene by File | save scene as … (example: 3FrameAnimation). |
|  | Drag sprite platformWoodBlocks from Project | Sprites to the scene. Change the position of GameObject to (-4, -5, 0). |
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|  | Add Box Collider 2D component to GameObject platformWoodBlocks so character2D may stand on this GameObject by Add Component | Physics 2D | Box Collider 2D. |
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|  | Create a new folder named Animations to save animation clip dan controller. |
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|  | Make sure that GameObject platformWoodBlocks is clicked in hierarchy then open Animation panel (Window | Animation). |
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|  | Create a clip by click create button in Animation Pannel, then name it platform-woodmoving-up-down and save to Animations folder |
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|  | Click Curve button in Animation Panel, then select Transform | Position, then click '+' sign. In this step, position change of (X, Y, Z) at GameObject platformWoodBlocks will be recorded. |
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|  | Y ou will see 2 'keyframes' at 0.0 and 1.0. The keyframe is represented by diamonds |
|  | 3 keyframes is needed in this activity, to add 1 keyframe more, please click 2:00 at the Timeline then click diamond+ to create a new keyframe. |
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|  | Keyframe pertama dan ketiga sudah benar nilai Y = -5 karena keyframe tersebut merekam/record tinggi dari wood platform. Akan tetapi kita mengubah keyframe yang di tengah sehingga merekam ketinggian wood platform ketika berada di puncak gerakannya. Dengan cara pilih keyframe yang kedua (pada timeline ke 1:00). |
|  | Setelah memilih keyframe ke 1:00 kemudian ubah nilai Y=0. Dan yang perlu diperhatikan nilai X,Y,Z pada inspector memiliki background merah yang menandakan Transform component sedang direkam pada animation clip |
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|  | Run your project. The wood platform will move up and down slowly and repeatedly |
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| 1. Create Animation from One State to Another State | |
|  | Continouing our previous activity, create a new scene named MoveStateToState by File | save scene as …. |
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|  | In hierarchy, create a new Empty GameObject named water-block-container with position (2.5, -4, 0) to make Water Block animation |
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|  | Drag sprite Water Block from PotatoMan2DAssets | Sprites to scene, place it to be child of GameObject water-block-container. Make sure GameObject Water Block position is (0, 0, 0) (sided with wall block platform) |
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|  | Add Box Collider 2D at GameObject Water Block, change the layer GameObject to be Ground so the character2D may jump up the water block platform. |
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|  | Make sure GameObject Water Block has been selected in Hierarchy, open Animation Panel then create a new clip named platform-water-up. Save it to folder Animations. |
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|  | Click Curves then add property then select Transform | Position. |
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|  | ves then add property then select Transform | Position. 7. Remove the second keyframe at 1:00 to activate the upstream of water block animation |
|  | Create the second animation clip named platform-water-down then add property and select Transform | Position. Remove the second keyframe at 1:00. |
|  | Still on platform-water-down, set the timeline to 0:00 then change the value of Y=-5. It will make a downstream water block animation. |
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|  | Open Animator panel, it will look like this: |
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|  | Although 2 animation clips (states) have been created, It is only Up state that active. It is because when scene starts, (Entry state) object will go to state platform-water-up, but no transition to state platform-water-down, so GameObject Water Block will always be Up state. |
|  | Create a new C# script named WaterBlock with this following code, then add this script to GameObject Water Block. |
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|  | Duplicate GameObject water-block-container 6 times with position of X raises 1 point to each GameObject, for example 3.5, 4.5, 5.5, etc |
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|  | Run your project. Look at when the player passes the water block, the water block will make a downward, and the player keeps going |
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| 1. **Animation Clip from Sprite Sheet Sequences** | | |
|  | Create a new 2D Unity project. |
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|  | Drag folder SpritesSheetSequences into asset. |
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|  | Select image monster1 at Project panel, change sprite mode to Multiple in inspector, then open Sprite Editor panel by click button Sprite Editor. |
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|  | In Sprite Editor, open Slice at dropdown dialog, set Type=Grid, then change the grid Pixel Size to be 64x64, then click button Slice. Click button Apply which is on Sprite Editor panel. |
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|  | In Project panel, click expand triangle button at image monster1. |
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|  | Create a new folder named Animation |
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|  | In Animation folder, create Animator Controller named monster-animator by click Create | Animator Controller. |
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|  | In the scene, create a new Empty GameObject named monster1 then set position (X, Y, Z) to (0, 0, 0). Drag monster-animator to GameObject. |
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|  | At Hierarchy, select GameObject monster1, then open Animation panel (at Window | Animation), then create Animation Clip named Idle (by click button Create in Animation panel). |
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|  | In Project Panel, select monster1 then drag the first of 5th frame (0th – 4th frame) one by one to Animation Panel. Set the Samples value to 12 which means this animation is used to run 12 frames per second |
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|  | Look at this state-chart, it shows that the default size named idle. |
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|  | Run your project, it shows that GameObject monster1 runs on idle state. It happens because sprite is in small size, so Camera size can be smaller |
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**SUMMARY**

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| Student may be able to create an animation in 2D object, in certain GameObject component, understand in state function in game development, implement a trigger scheme in game development and also create an animation from sprite sheet sequence. |

**SELFIE (WITH PROJECT)**

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