

# Questions and Exercises

*These questions and exercises is an opportunity to see what you've learnt from the lecture as well as practice the new things we've been talking about. In other words, these questions and exercises are completely optional but it's recommended to do them. In the end of the document you will find the answers to the questions as well as possible solutions to the exercises, note that one can solve an exercise in different ways. There will also be some suggestions about what one could code if one want to continue with some more advanced things. These suggestions will not come with a possible solution and might include things that haven't been covered in the lecture.*

## Question 1

How do you make a part of a model spin? How should its current angle be generated?

## Question 2

One can set a ModelRenderer as a child to another ModelRenderer. Why would you want to do this and how does the rendering work for child models?

## Question 3

One can't really change the size of a box during an animation in an easy way. How can we in some cases simulate this and what do we have to look out for?

## Exercise

Continue with the exercise from the last lecture. Add a chest on the back of the turtle. The lid of the chest should open when you right click the turtle. The lid should close after a few seconds.

## Further explorations 1

Continue with the exercise and give the turtle's chest an inventory with an interface. Make sure that the lid open as long as any player is looking in the interface. Note that if somebody else is looking in the interface the lid should still be open for you.

## Further explorations 2

Continue with the exercise. Allow the use to lock the chest by shift right-clicking the turtle(unlock it the same way). When it's locked one can't open the chest but more importantly the texture of the chest should change to affect this. You shouldn't have multiple chests with different textures nor having the texture of the turtle itself in different files.

# Answers and solutions

## Answer to Question 1

In the render method of the model you'll have to apply all the animations before doing the rendering itself. You do this by simply change the values of the ModelRenderers, so if you want a part to spin you'll have to set the rotateAngleX, rotateAngleY or rotateAngleZ. The value of the angle should be received from the entity itself.

**Answer to Question 2**

If a parent ModelRenderer is moved all the child models will be moved in the same way. This allow you to control a big and complex part of the model by just moving the main part. The same applies with rotations which allow you to rotate child models around their parents. When rendering a ModelRenderer all its child models will also be rendered, this means that you shouldn't tell child models to be rendered since they will be rendered anyways (given that you render their parent models).

**Answer to Question 3**

If we can hide boxes inside each other we can simply move out the hidden parts and it will look like they change in size. This is of course only possible if there's enough space to hide a box within another. You'll also need to make sure that faces of different boxes tries to be rendered at the exact same position. To fix this simply change one of the boxes' value by a tiny amount, one won't be able to tell that the value is slightly off.

**Possible solution to Exercise**

<https://dl.dropboxusercontent.com/u/46486053/TurtleSolution2.zip>