02561 COMPUTER GRAPHICS   IMM. DTU

Exercise 7 : Shadows and render pipeline

Reading	Angel: chapter 4.4-4.7, 4.10
Purpose	The purpose of the exercise is to use OpenGL to produce simple shadows using projection matrices and to get a better understanding of the output pipeline. We are only are concerned with generating the shadows – this means that using Phong lighting is an optional extension. As a help the view direction is visualized in the upper right corner. Red = x-axis, green=y-axis and blue = z-axis.

Part 1
Shadow projection
	Implement shadow projection. You can use the mouse to see the scene from different angles. Keyboard 'p' to pause the movement of the light-source and keyboard 't' to toggle shadow projection type.
	   a) Implement the function `createShadowProjectionPointLight` which should create a shadow projection matrix that projects the scene onto the plane Xw=-4 from the point light. When implemented correct you should see a shadow behind the cube.
	   b) Implement the function `createShadowProjectionDirectionalLight` which should create a shadow projection matrix that projects the scene onto the plane Xw=-4 using directional light. The light direction is here the vector from light position to origin (0,0,0).
	   c) Change the program so when pressing keyboard 'd' the shadow plane should toggle between Xw = -4 and Xw = -8.
	   d) Extend the `drawScene` function to draw 4 cubes at different locations.

Part 2 Optional	Implement Phong lighting for the geometry on the scene.