**A programming project you did and a technical problem you faced in the project with solution to it -**

I created Gameplay supporting systems for a 2D game engine, including Physics, Collision and 4x4 Matrix & Vector4 Math. I implemented the Swept Separating Axis Test for collision checks, and two types of responses to these checks - block & overlap. I implemented Pong using this engine. Since the game world of Pong is very sparse, I optimized the collision system by updating coordinate transformation matrices only for moveable objects (the paddles and the ball), checking collision of only the ball with other objects & responding to only the earliest collision, to capitalize on this fact.

I also setup the engine's containers/handlers for holding and dealing with the game objects and their Renderables, Physics bodies etc. A problem that occurred during the game was that there were certain game objects, like the game's text to indicate the score and state of the game, which would cause errors at run-time. Of course, I knew it was those specific objects because the errors started after introducing them into the game and more importantly around the appearance and disappearance of them. So I ran the game with debugging, stepped through the parts related to the creation and deletion of the error-causing objects and I was able to reproduce those errors. So I made sure I was properly handling their creation and deletion, because the errors also pointed out that there were missing references. It turned out that the problem actually went both ways - I had made a small mistake in my core code for deleting Renderables from memory and I was also incorrectly handling the deletion of the text game objects. I was able to solve the issue in a small amount of time after that because I had found out exactly what was going wrong.