A sample of Projects done in each language

Java

During my Extended Diploma in IT I created GUI calculate for calculating the paint cost for a room with x,y,z dimensions.I split my code into multiple procedures because the amount of code required for each section would be too much to all run in one go. It could cause mistakes in the code and there would simply just be too much code to run through. I used methods and split my code into different classes. A method for each of the paints, the calculations and the undercoat. I then call the methods independently depending on the options the user choses based on a class of switch statements.

C#

In my First year of Computer Science at the University of Lincoln I took part in a game jam where I created a game using C# in 24-hours using the Unity cross platform game engine. The goal of the game was to pick up items which would reveal the paths to take to get to complete each level of the game. I used open source libraries to get a character model and programmed the character to move using an open source character controller. The Game assets were also openly available but the environment was put together purely by my imagination.

Python

In my second year of Computer Science at the University of Lincoln I lead a team of students to program a robot to play a game of match the cards with a human, in a simulated environment. The project was split into two subprograms, a computer vision program that allowed the robot to see cards and their details and write those details to a text file, and a simulation to simulate the robot pointing at the card locations. The simulation was written in python using the qiBullet simulation tool and utilised a robot referred to as “Pepper”. The robot was programmed to detect and read in details from cards such as their numbers, symbols, and colour as well as grid positions and then use this information to create an array of their positions for accurate pointing of their locations. The robot was programmed to point at the card locations by converting the x and y coordinates in radians that the joints of the robot arm could be positioned into automatically when it was the robot’s turn to point at a card.

C++

During my third year in Computer Science at the University of Lincoln, my dissertation project was improving on an existing research project that was based on simulating the movements on a swarm of robots called turtlebots. This swarm simulation was based on the Lennard-Jones potential and was written in C++ but simulated using a multi-physics robot simulator called ARGoS simulation. The improvements I made included implementing obstacle avoidance to enable the robots to move around obstacles in their paths and get to a goal state much sooner, implementing conditional statements for when obstacle avoidance was necessary and when exploration mode was necessary, this allowed the robots to look for exists when they were separated from the swarm and act independently, a behaviour that was not present before I modified the original code. I demonstrated the results of this in comparison to the original algorithm in MATLAB with a series of boxplots and bar charts along with video comparisons of the simulations running simultaneously