Tools and Techniques

The tools and techniques used for the chatbot application are:

An Integrated Development Environment: Visual Studio Code

We chose Visual Studio Code as our preferred development environment as it will allow us to write code using the python language.

GitHub

We will use GitHub for code hosting, version control of our application, and collaboration.

We will also use the following libraries provided by python for our chatbot application:

Dronekit: makes it easy to create custom applications to control any vehicle powered by MAVLink.

NumPy: it makes it easy for us to work with arrays.

Pymavlink: This is a Python implementation of the MAVLink protocol.

OpenCV: library of programming functions mainly for real-time computer vision.

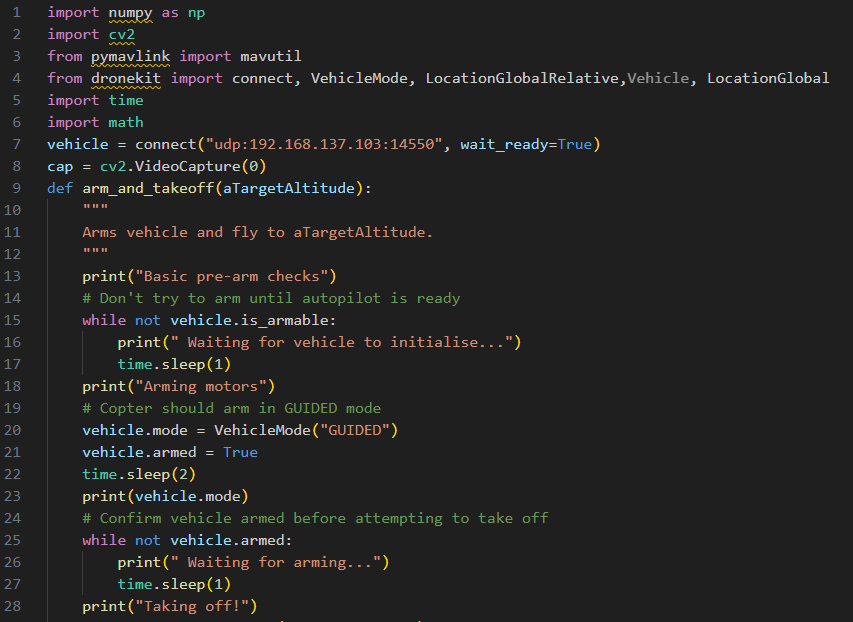
Machine learning approach: **Reinforcement learning**

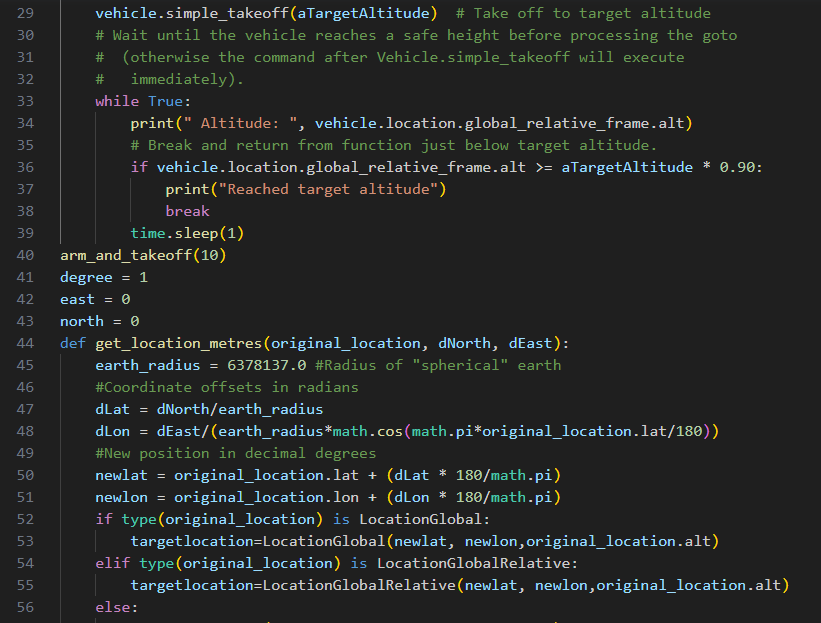
Drones are now used in a wide range of industries and now thanks to machine learning drones can learn to fly on their own. The type of machine learning used to train self-flying drones is through Reinforcement learning. An area of machine learning where a robot ‘agent’ interacts with its environment, receives a positive or negative reward, and adjusts its behaviour accordingly.

In drone automation, RL can be used for object tracking, obstacle avoidance, and navigation. Drones can learn to navigate through complex environments, avoid obstacles, and reach their destinations quickly with the help of RL. This type of machine learning can be used to teach drones how to fly without hitting other objects in crowded areas like cities.

Algorithms that will be in use: -

1. Navigation algorithms, deep classification learning with deep neural networks: The deep neural network learns to navigate by generating labelled training data where the label scores the quality of the path chosen.
2. Genetic algorithms: They generate a population of randomly generated solutions and use the principles of natural selection to select useful sets of solutions.
3. Meta-heuristic swarm intelligence algorithms: aim to find the best model by exploring the model space in an intelligent manner via emergent behaviour.





A computer screen shot of a program

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A screen shot of a computer program

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