

Simulation Engineering Assignment

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Assignment 1: code

```
#include <iostream>

using namespace std;

double calculateSteps(double timeInSeconds, double timeDifference, double
helicopterTorque, double &velocity, double &angularVelocity, int lyy, double &yaw);

int main()
{
    double timeDifference = 0.01;
    double helicopterTorque = 0.3;
    double timeInSeconds = 0.0;
    double yaw = 0.0, velocity = 0.0, angularVelocity = 0.0;
    int lyy = 3800;

    for (int x = 0; x < 10; x++) // Iterate for 10 seconds (10 * 100 steps)
    {
        timeInSeconds += timeDifference;

        yaw = calculateSteps(timeInSeconds, timeDifference, helicopterTorque, velocity,
angularVelocity, lyy, yaw);

        cout << "Execution Time: " << timeInSeconds << "s\n";
        cout << "Calculated Yaw: " << yaw << "\n";
    }
}
```

```
    return 0;
}

double calculateSteps(double timeInSeconds, double timeDifference, double
helicopterTorque, double &velocity, double &angularVelocity, int lyy, double &yaw)
{
    angularVelocity = timeInSeconds * helicopterTorque;

    double tempAngularVelocity = angularVelocity / lyy;

    velocity += tempAngularVelocity * timeDifference;

    yaw += velocity * timeDifference;

    return yaw;
}
```

```
Execution Time: 0.01s
Calculated Yaw: 7.89474e-11
Execution Time: 0.02s
Calculated Yaw: 3.15789e-10
Execution Time: 0.03s
Calculated Yaw: 7.89474e-10
Execution Time: 0.04s
Calculated Yaw: 1.57895e-09
Execution Time: 0.05s
Calculated Yaw: 2.76316e-09
Execution Time: 0.06s
Calculated Yaw: 4.42105e-09
Execution Time: 0.07s
Calculated Yaw: 6.63158e-09
Execution Time: 0.08s
Calculated Yaw: 9.47368e-09
Execution Time: 0.09s
Calculated Yaw: 1.30263e-08
Execution Time: 0.1s
Calculated Yaw: 1.73684e-08

...Program finished with exit code 0
Press ENTER to exit console.□
```

}