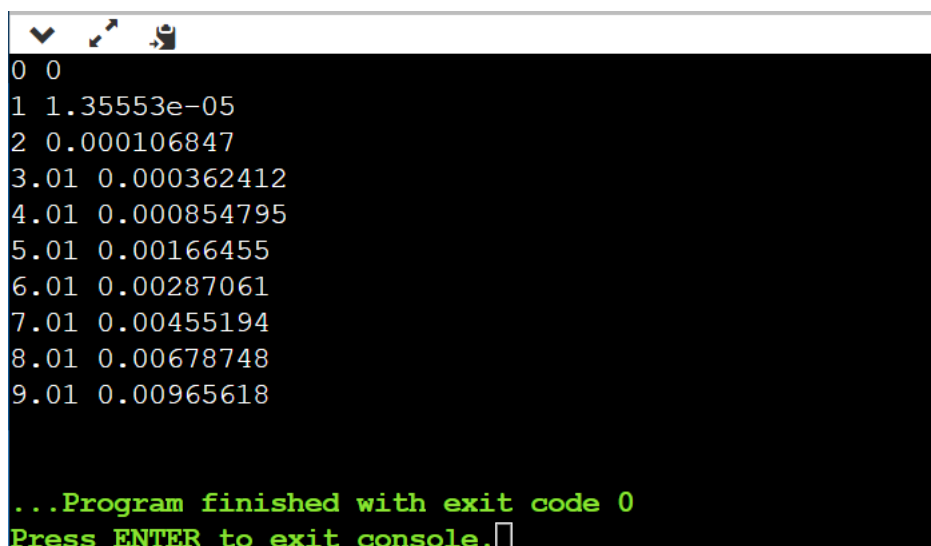


## Assignment 1

### Explanation:

- Include necessary headers: The code includes the iostream header for input/output operations.
- Class definition: The code defines a class named Simulation.
- Class variables: The class has several member variables including the moment of inertia  $I_{yy}$ , the step size `stepsize`, the torque `torque`, the time step `time_step`, the current time `time`, the current yaw `yaw`, the current yaw rate `yaw_rate`, and the current acceleration `acceleration`.
- Class method: The class has a single method named `calculate()`.
- Initialization: In the `calculate` method, the member variables are initialized with the given values for  $I_{yy}$ , `stepsize`, `torque`, and `time_step`.
- Simulation loop: The code contains a for loop that runs `stepsize` times (1000 times in this case). The loop increments the time `time` by `time_step` in each iteration.
- Calculating acceleration: The acceleration `acceleration` is calculated using the formula  $acceleration = (torque * time) / I_{yy}$ .
- Implementing Euler integration: The yaw rate `yaw_rate` is updated using the formula  $yaw\_rate = yaw\_rate + (acceleration * time\_step)$ . The yaw `yaw` is updated using the formula  $yaw = yaw + (yaw\_rate * time\_step)$ .
- Logging: The code checks if the current iteration number `i` modulo 100 is equal to 0. If it is, then the current time `time` and yaw `yaw` are logged to the console.
- End of the method: The `calculate` method ends after the loop has finished executing.

### Output:



```
0 0
1 1.35553e-05
2 0.000106847
3.01 0.000362412
4.01 0.000854795
5.01 0.00166455
6.01 0.00287061
7.01 0.00455194
8.01 0.00678748
9.01 0.00965618

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

