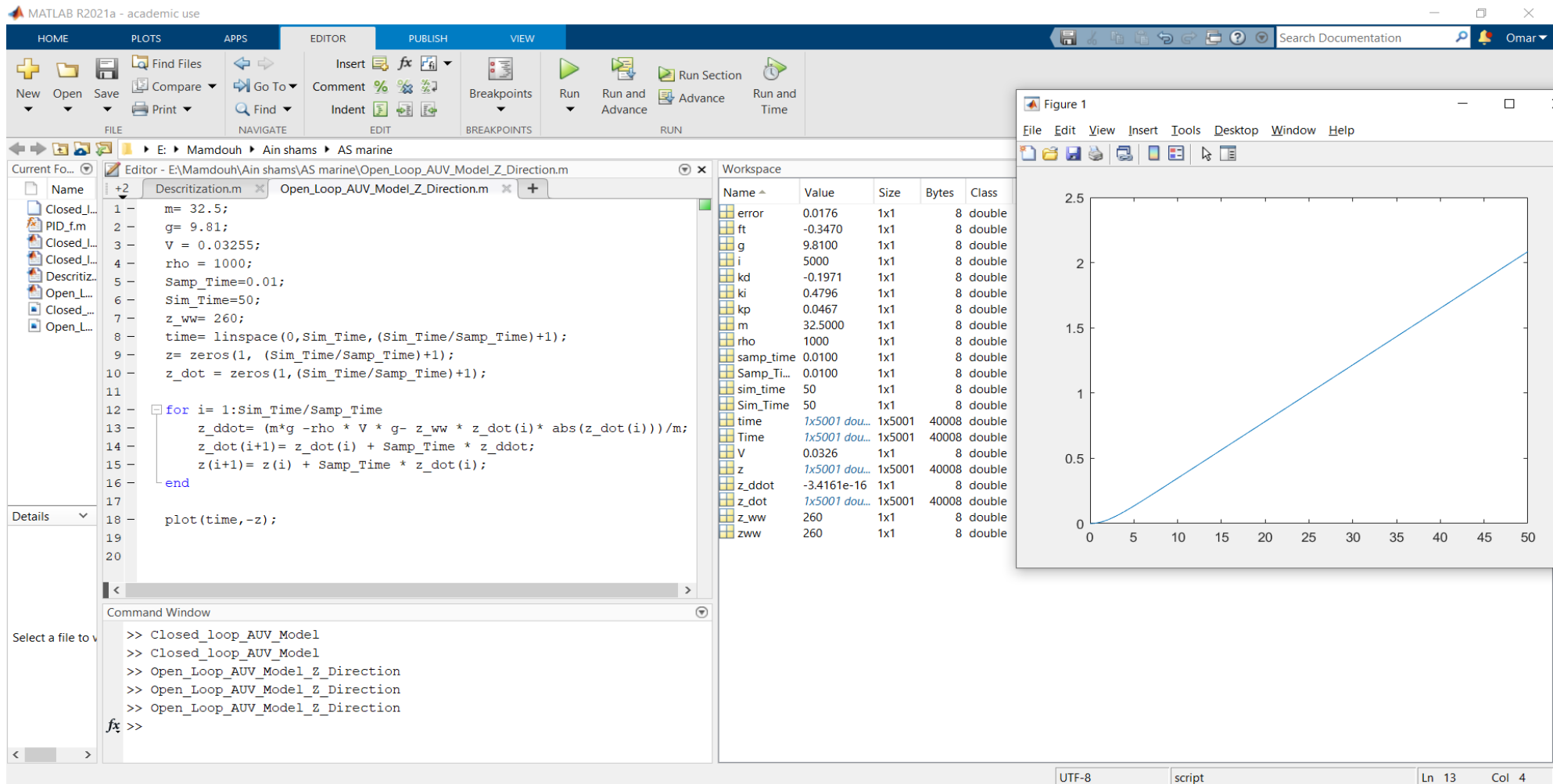
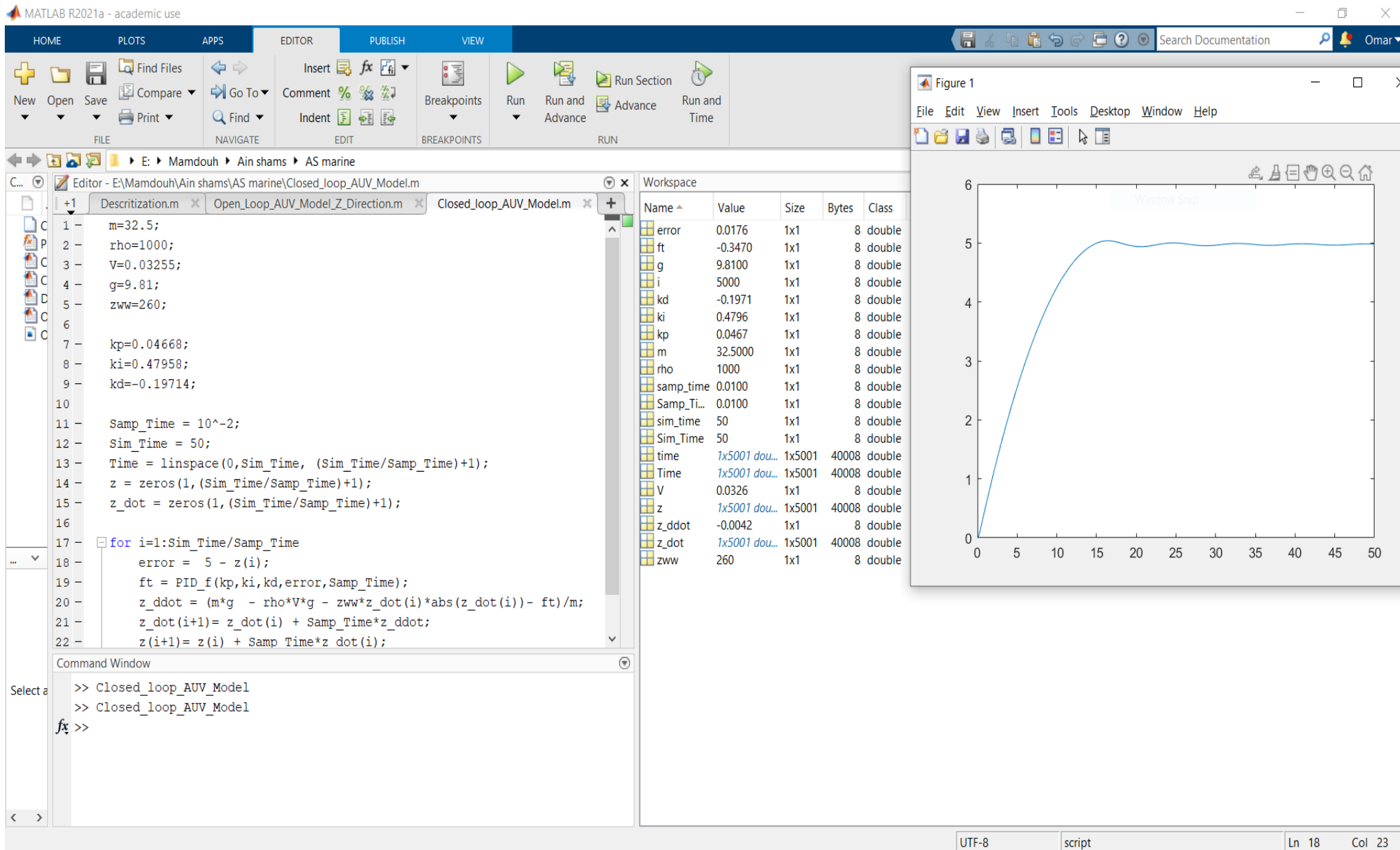


Assignment (1)

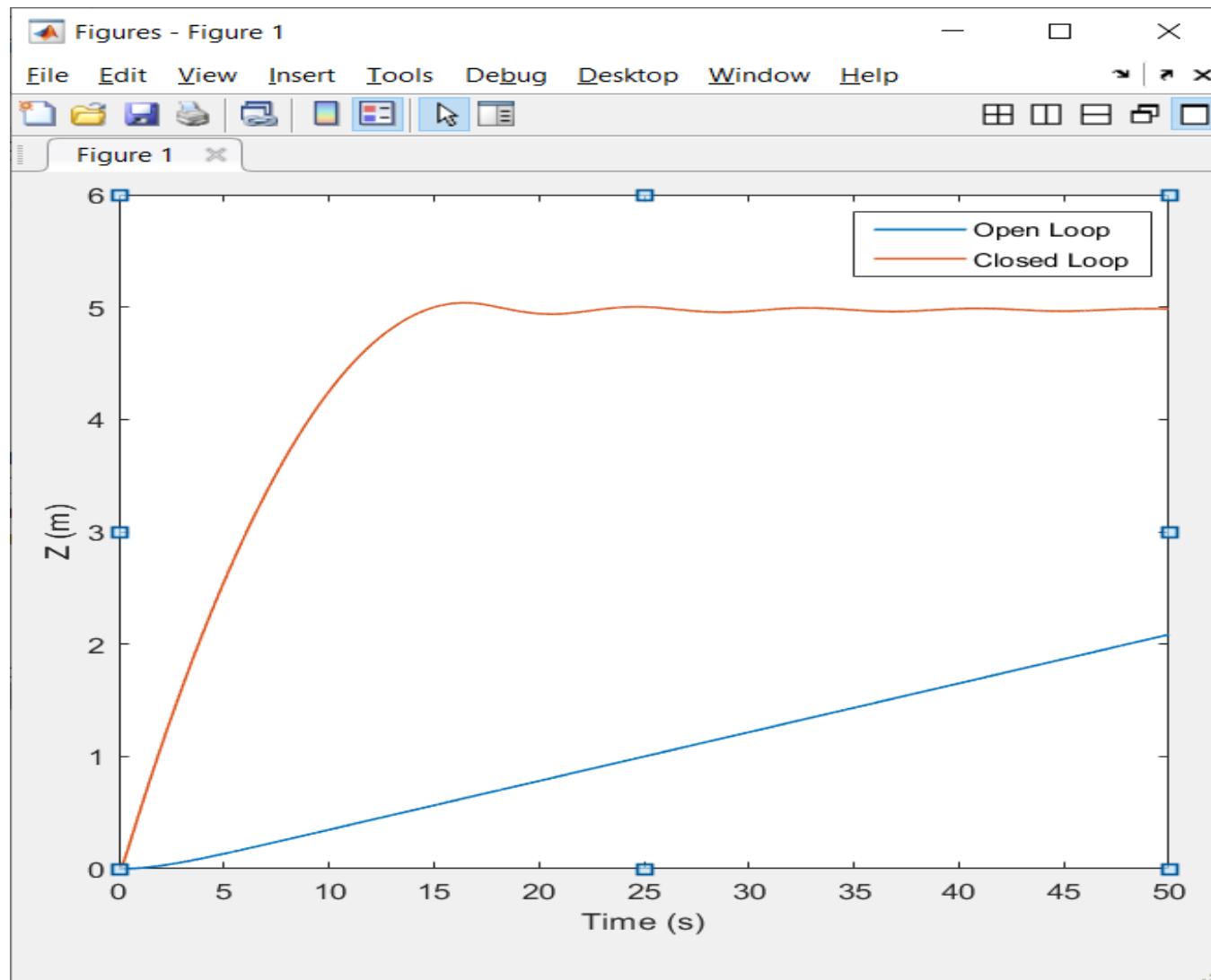
Open Loop Output Screen shot



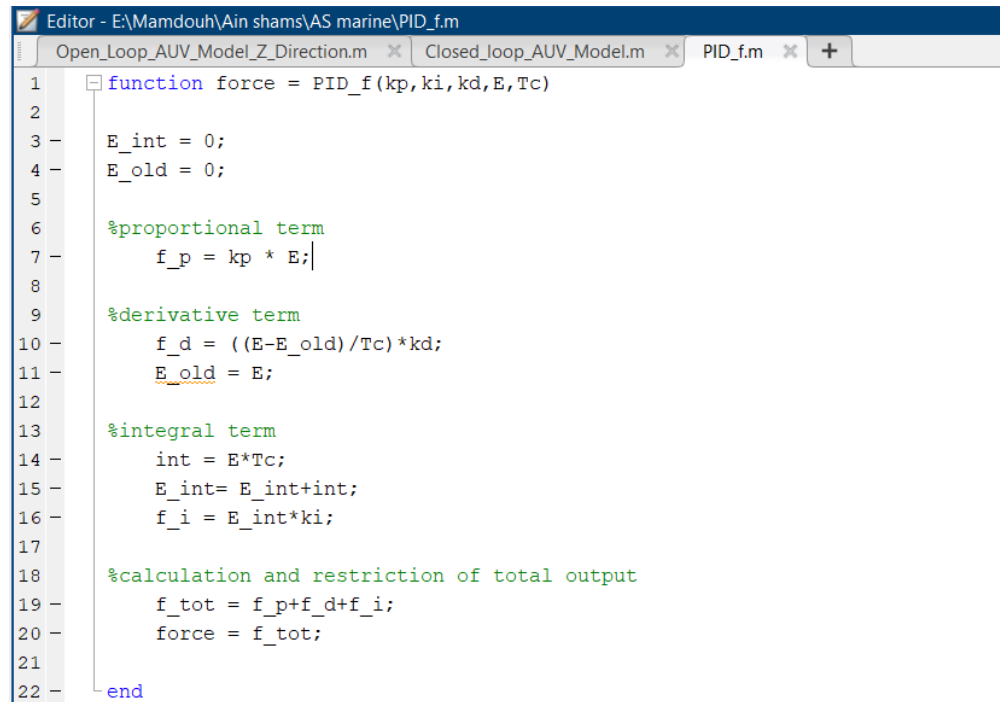
Closed Loop Output Screen shot



Closed & Open loop Output



Edited PID_f.m Function



The screenshot shows a MATLAB editor window with the title bar "Editor - E:\Mamdouh\Ain shams\AS marine\PID_f.m". The window contains three tabs: "Open_Loop_AUV_Model_Z_Direction.m", "Closed_Loop_AUV_Model.m", and "PID_f.m". The "PID_f.m" tab is active, displaying the following code:

```
1 function force = PID_f(kp,ki,kd,E,Tc)
2
3     E_int = 0;
4     E_old = 0;
5
6     %proportional term
7     f_p = kp * E;
8
9     %derivative term
10    f_d = ((E-E_old)/Tc)*kd;
11    E_old = E;
12
13    %integral term
14    int = E*Tc;
15    E_int= E_int+int;
16    f_i = E_int*ki;
17
18    %calculation and restriction of total output
19    f_tot = f_p+f_d+f_i;
20    force = f_tot;
21
22 end
```

Changed initialization

global E_int; to zero value

global E_old; to zero value

