
John Clouse IMD HW5 problem 1

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Initialize

```
clearvars -except hw_pub function_list
```

```
AU = 1.49597870691e11; %km  
GMs = 1.32712440018e20;  
GMem = 4.035032351966808e14;
```

```
mu = GMem/(GMs+GMem);
```

```
x=15e7;  
y = 6e3;  
z = 1450;
```

```
vx = 0.00075;  
vy = 0.08;  
vz = 0.019;
```

```
t = 450;
```

```
period = 2*pi*sqrt(AU*AU*AU/GMs);
```

Results

```
fprintf('Position:\n')  
fprintf('x = %.5e\n', x/(AU/1e3));  
fprintf('y = %.5e\n', y/(AU/1e3));  
fprintf('z = %.5e\n', z/(AU/1e3));  
fprintf('\nVelocity:\n')  
fprintf('Vx = %.5e\n', vx/(AU/1e3)*period/2/pi);  
fprintf('Vy = %.5e\n', vy/(AU/1e3)*period/2/pi);  
fprintf('Vz = %.5e\n', vz/(AU/1e3)*period/2/pi);  
fprintf('\nTime = %.4f\n', t/(period/3600/24)*2*pi);
```

```
Position:
```

```
x = 1.00269e+00  
y = 4.01075e-05  
z = 9.69265e-06
```

```
Velocity:
```

```
Vx = 2.51807e-05  
Vy = 2.68594e-03
```

$V_z = 6.37912e-04$

$Time = 7.7409$

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