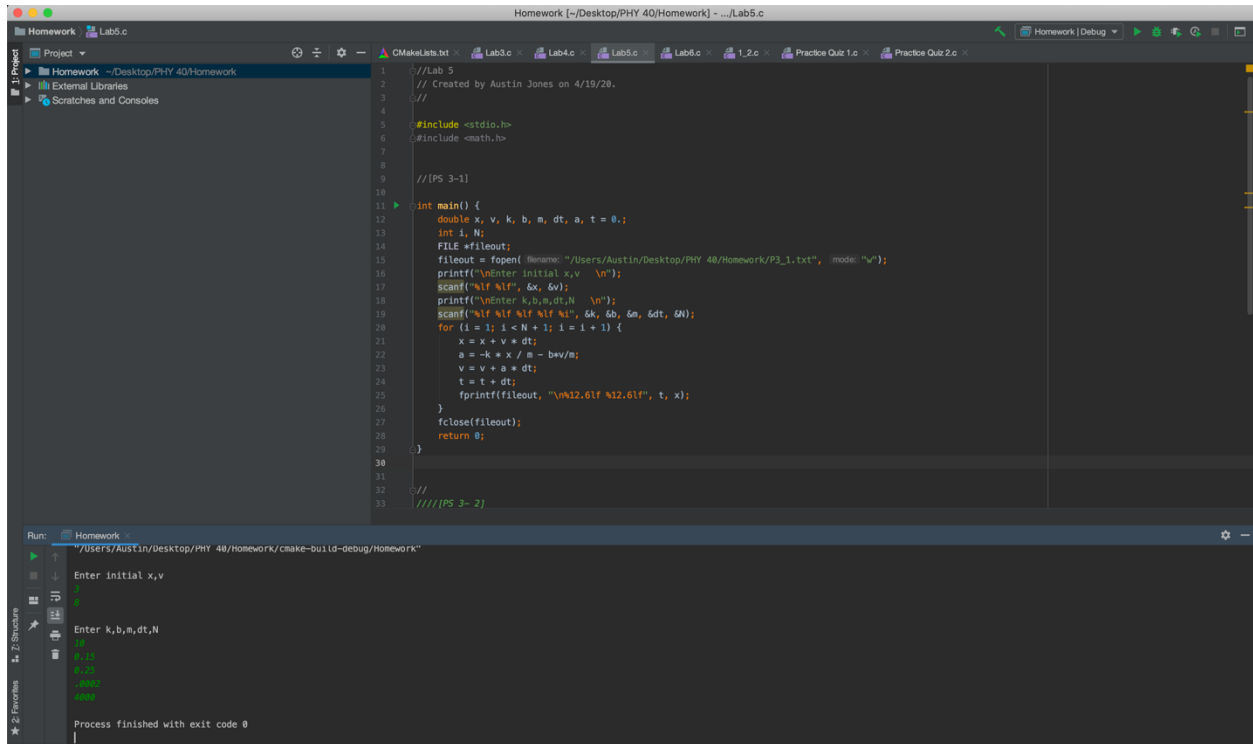


PS [3-1]



```
1 //Lab 5
2 // Created by Austin Jones on 4/19/20.
3 //
4
5 #include <stdio.h>
6 #include <math.h>
7
8
9 //PS 3-1
10
11 int main() {
12     double x, v, k, b, m, dt, a, t = 0.;
13     int i, N;
14     FILE *fileout;
15     fileout = fopen("Name: /Users/Austin/Desktop/PHY 48/Homework/P3_1.txt", "w");
16     printf("\nEnter initial x,v  \n");
17     scanf("%lf %lf", &x, &v);
18     printf("\nEnter k,b,m,dt,N  \n");
19     scanf("%lf %lf %lf %lf %lf", &k, &b, &m, &dt, &N);
20     for (i = 1; i <= N + 1; i = i + 1) {
21         x = x + v * dt;
22         a = -k * x / m - b * v / m;
23         v = v + a * dt;
24         t = t + dt;
25         fprintf(fileout, "%12.6lf %12.6lf", t, x);
26     }
27     fclose(fileout);
28     return 0;
29 }
30
31 //
32
33 //PS 3-2
```

Run: Homework
/Users/Austin/Desktop/PHY 48/Homework/cmake-build-debug/Homework

Enter initial x,v
0
0

Enter k,b,m,dt,N
0.11
0.01
0.0001
0.0001

Process finished with exit code 0

[PS 3-2]

```
27 // fclose(fileout);
28 // return 0;
29 //}
30
31
32
33 //PS 3-2]
34
35 int main() {
36     double f, x, v, m, dt, a, t = 0.;
37     int i, N;
38     FILE *fileout;
39     fileout = fopen("name: ~/Users/Austin/Desktop/PHY 48/Homework/PS3_2.txt", "w");
40     printf("\nEnter initial x,v \n");
41     scanf("%lf %lf", &x, &v);
42     printf("\nEnter f,m,dt,N \n");
43     scanf("%lf %lf %lf %lf", &f, &m, &dt, &N);
44     for (i = 1; i < N + 1; i = i + 1) {
45         x = x + v * dt;
46         a = f/m;
47         v = v + a * dt;
48         t = t + dt;
49         fprintf(fileout, "%12.6lf %12.6lf", t, x);
50     }
51     fclose(fileout);
52     return 0;
53 }
54
```

Run: Homework

"/Users/Austin/Desktop/PHY 48/Homework/cmake-build-debug/Homework"

Enter initial x,v

1.0
1.0

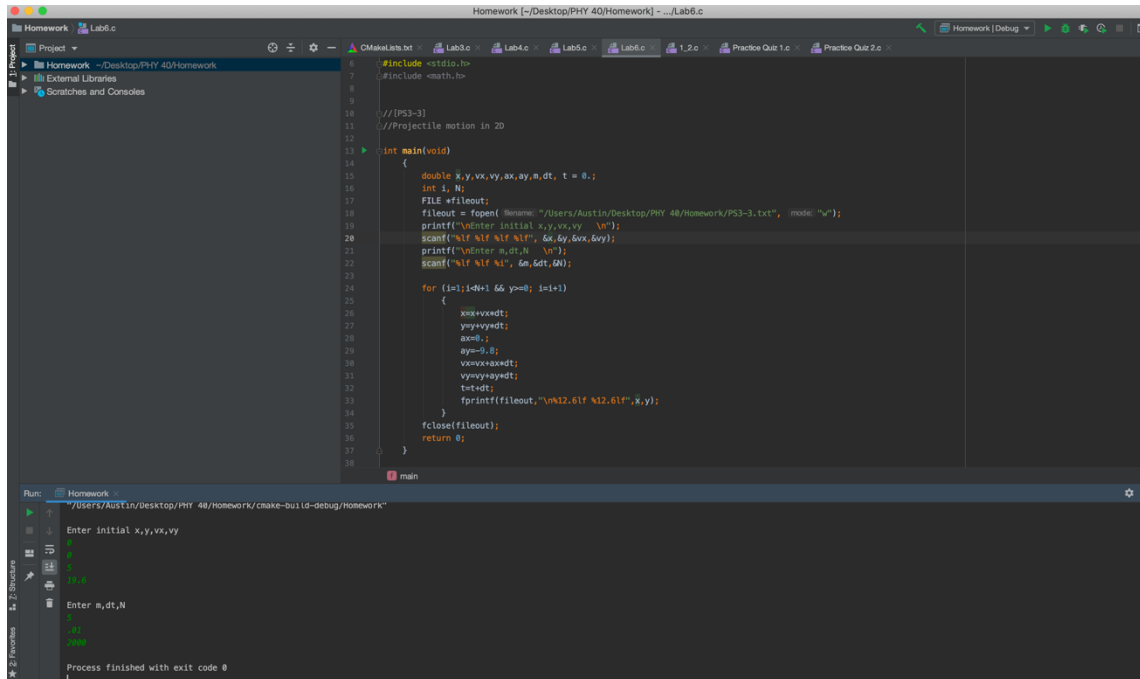
Enter f,m,dt,N

1
10
0.01
1000

Process finished with exit code 0

[PS 3-3]

For $m = 5$



```
1  #include <stdio.h>
2  #include <math.h>
3
4  // [PS3-3]
5  // Projectile motion in 2D
6
7  int main(void)
8  {
9      double x,y,vx,vy,ax,ay,m,dt, t = 0.;
10     int i, N;
11     FILE *fileout;
12     fileout = fopen( "name: /Users/Austin/Desktop/PHY 48/Homework/PS3-3.txt", mode: "w");
13     printf("\nEnter initial x,y,vx,vy \n");
14     scanf("%lf %lf %lf %lf", &x,&y,&vx,&vy);
15     printf("\nEnter m,dt,N \n");
16     scanf("%lf %lf %lf", &m,&dt,&N);
17
18     for (i=1;i<=N; i++)
19     {
20         x+=vx*dt;
21         y+=vy*dt;
22         ax=-9.8;
23         ay=0.0;
24         vx+=ax*dt;
25         vy+=ay*dt;
26         t+=dt;
27         fprintf(fileout,"%12.6lf %12.6lf",x,y);
28     }
29     fclose(fileout);
30     return 0;
31 }
```

Run: Homework

/Users/Austin/Desktop/PHY 48/Homework/cmake-build-debug/Homework

Enter initial x,y,vx,vy

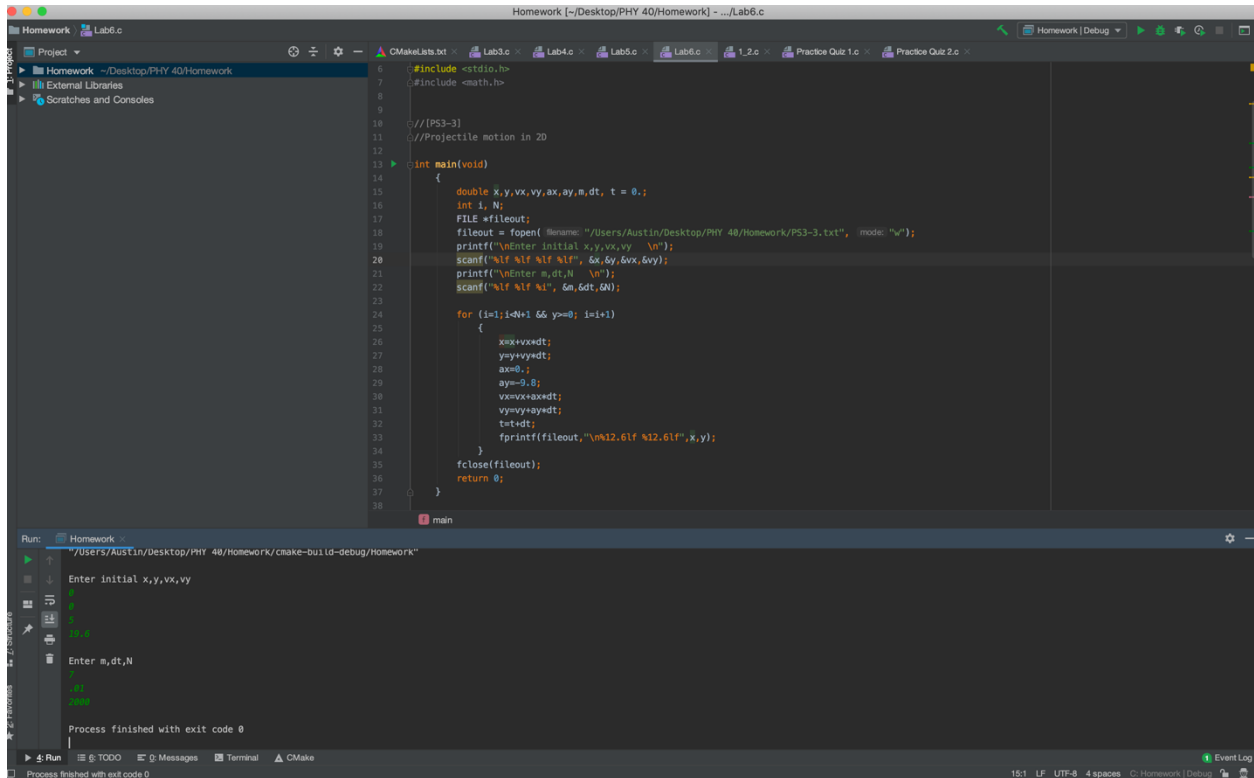
0 0 0 0

Enter m,dt,N

5 0.01 10

Process finished with exit code 0

For $m = 7$



```
1  #include <stdio.h>
2  #include <math.h>
3
4  // [PS3-3]
5  // Projectile motion in 2D
6
7  int main(void)
8  {
9      double x,y,vx,vy,ax,ay,m,dt, t = 0.;
10     int i, N;
11     FILE *fileout;
12     fileout = fopen( "name: /Users/Austin/Desktop/PHY 48/Homework/PS3-3.txt", mode: "w");
13     printf("\nEnter initial x,y,vx,vy \n");
14     scanf("%lf %lf %lf %lf", &x,&y,&vx,&vy);
15     printf("\nEnter m,dt,N \n");
16     scanf("%lf %lf %lf", &m,&dt,&N);
17
18     for (i=1;i<=N; i++)
19     {
20         x+=vx*dt;
21         y+=vy*dt;
22         ax=-9.8;
23         ay=0.0;
24         vx+=ax*dt;
25         vy+=ay*dt;
26         t+=dt;
27         fprintf(fileout,"%12.6lf %12.6lf",x,y);
28     }
29     fclose(fileout);
30     return 0;
31 }
```

Run: Homework

/Users/Austin/Desktop/PHY 48/Homework/cmake-build-debug/Homework

Enter initial x,y,vx,vy

0 0 0 0

Enter m,dt,N

7 0.01 10

Process finished with exit code 0