

TPRG 1131 Project 1: Soapbox Derby

Release 1: Mar 18, 2019

Test Cases A: soapboxes.csv

```
10.0, 12.5, 15.0
120.0, 0.25, 0.1
115.0, 0.15, 0.09
95.0, 0.15, 0.075
95.0, 0.15, 0.085
125.0, 0.15, 0.085
72.0, 0.15, 0.0782
```



1940 Maryland 4th of July celebrations
(US Library of Congress)

```
C:\Program Files\Python37\python.exe
Name of data file? (enter nothing for default soapboxes.csv)
Ramp length: 10.00 m; Ramp angle: 12.50 degrees; track length: 15.00 m

Car 1: mass=120.00kg  $\mu_s=0.250$   $\mu_k=0.1000$ 
Sorry, the static friction is too high to start rolling.

Car 2: mass=115.00kg  $\mu_s=0.150$   $\mu_k=0.0900$ 
Velocity at bottom of ramp: 5.022 m/s
Running length: 14.286 (doesn't reach the finish line)

Car 3: mass=95.00kg  $\mu_s=0.150$   $\mu_k=0.0750$ 
Velocity at bottom of ramp: 5.300 m/s
car 3 finish time: 7.642 s

Car 4: mass=95.00kg  $\mu_s=0.150$   $\mu_k=0.0850$ 
Velocity at bottom of ramp: 5.116 m/s
car 4 finish time: 8.750 s

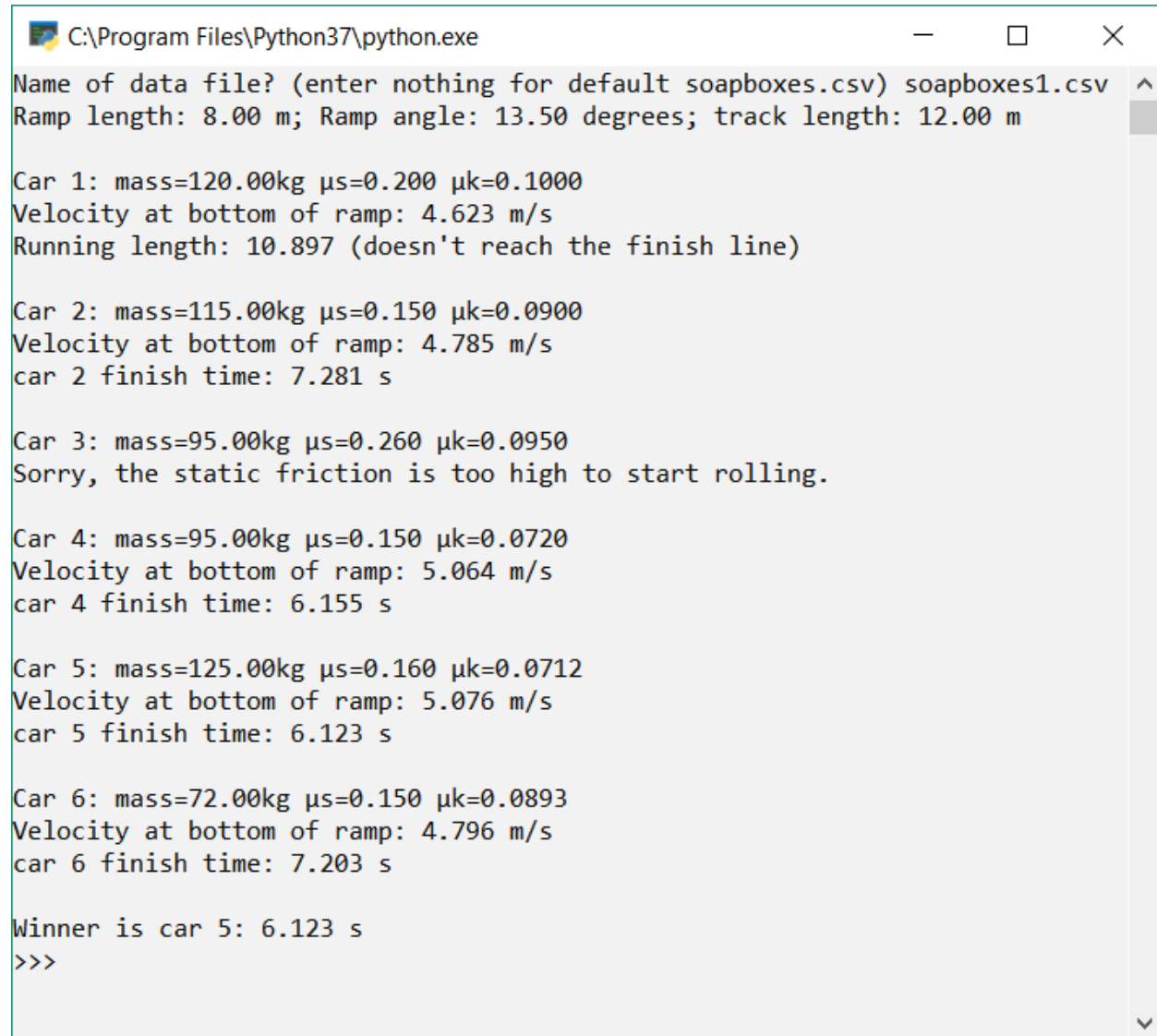
Car 5: mass=125.00kg  $\mu_s=0.150$   $\mu_k=0.0850$ 
Velocity at bottom of ramp: 5.116 m/s
car 5 finish time: 8.750 s

Car 6: mass=72.00kg  $\mu_s=0.150$   $\mu_k=0.0782$ 
Velocity at bottom of ramp: 5.242 m/s
car 6 finish time: 7.894 s

Winner is car 3: 7.642 s
>>> █
```

Test Cases B: soapboxes1.csv

```
8.0, 13.5, 12.0
120.0, 0.20, 0.1
115.0, 0.15, 0.09
95.0, 0.26, 0.095
95.0, 0.15, 0.072
125.0, 0.16, 0.0712
72.0, 0.15, 0.0893
```



```
C:\Program Files\Python37\python.exe
Name of data file? (enter nothing for default soapboxes.csv) soapboxes1.csv
Ramp length: 8.00 m; Ramp angle: 13.50 degrees; track length: 12.00 m

Car 1: mass=120.00kg  $\mu_s=0.200$   $\mu_k=0.1000$ 
Velocity at bottom of ramp: 4.623 m/s
Running length: 10.897 (doesn't reach the finish line)

Car 2: mass=115.00kg  $\mu_s=0.150$   $\mu_k=0.0900$ 
Velocity at bottom of ramp: 4.785 m/s
car 2 finish time: 7.281 s

Car 3: mass=95.00kg  $\mu_s=0.260$   $\mu_k=0.0950$ 
Sorry, the static friction is too high to start rolling.

Car 4: mass=95.00kg  $\mu_s=0.150$   $\mu_k=0.0720$ 
Velocity at bottom of ramp: 5.064 m/s
car 4 finish time: 6.155 s

Car 5: mass=125.00kg  $\mu_s=0.160$   $\mu_k=0.0712$ 
Velocity at bottom of ramp: 5.076 m/s
car 5 finish time: 6.123 s

Car 6: mass=72.00kg  $\mu_s=0.150$   $\mu_k=0.0893$ 
Velocity at bottom of ramp: 4.796 m/s
car 6 finish time: 7.203 s

Winner is car 5: 6.123 s
>>>
```