Homework #8

01286120 Elementary Systems Programming

Software Engineering Program

Faculty of Engineering, KMITL

By

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1. Write functions that convert between coordinate systems

The first thing you need to do in this homework exercise is to define the structure Point for storing a point with cartesian coordinates (x, y) and the structure PolarPoint for storing a point with polar coordinates (r, t) , and then use it to write the following functions.

1.1) Write the function to_polar(pt_list) that converts each point with cartesian coordinates (x, y) in a point list pt_list to a new point list with polar coordinates (r, t) as a result.

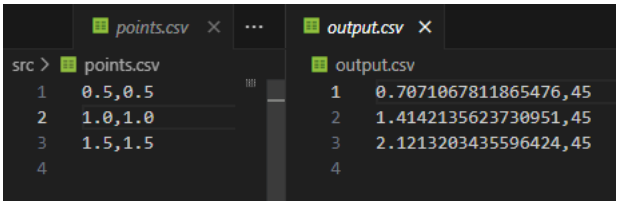
```
    Finished test [unoptimized + debuginfo] target(s) in 0.01s
     Running unittests src\bin\Q1.rs (target\debug\deps\Q1-f42b88550ac28c6a.exe)

running 1 test
test test_to_polar ... ok

test result: ok. 1 passed; 0 failed; 0 ignored; 0 measured; 1 filtered out; finished in 0.00s
```

1.2) Write the function to_cartesian(pt_list) that converts each point with polar coordinates (r, t) in a point list pt_list to a new point list with cartesian coordinates (x, y) as a result.

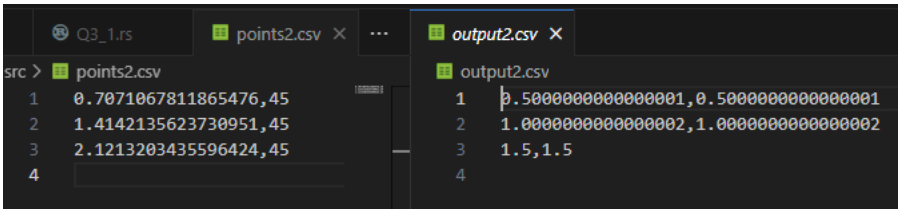
```
    Finished test [unoptimized + debuginfo] target(s) in 0.01s
     Running unittests src\bin\Q1.rs (target\debug\deps\Q1-f42b88550ac28c6a.exe)

running 1 test
test test_to_cartesian ... ok

test result: ok. 1 passed; 0 failed; 0 ignored; 0 measured; 1 filtered out; finished in 0.00s
```

2. Write programs that convert between coordinate systems

2.1) Write a program to read a point list in cartesian coodinates (x, y) from a CSV file and convert the list to polar coordinates (r, t) , then save it as another CSV file.



2.2) Write a program to read a point list in polar coodinates (r, t) from a CSV file and convert the list to cartesian coordinates (x, y) , then save it as another CSV file.



3. Adapt programs to generate HTML table

3.1) Modify the program in 2.1) to save the output as a HTML table instead of a CSV file.

Cartesian to Polar

Cartesian	Polar
(0.5, 0.5)	(0.7, 45.0)
(1.0, 1.0)	(1.4, 45.0)
(1.5, 1.5)	(2.1, 45.0)

3.2) Modify the program in 2.2) to save the output as a HTML table instead of a CSV file.

Polar to Cartesian

Polar	Cartesian
(0.7, 45.0)	(0.5, 0.5)
(1.4, 45.0)	(1.0, 1.0)
(2.1, 45.0)	(1.5, 1.5)