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Week 1: Assignment 4
Basic Trignometry with Shell Scripting

[*Last Updated on: **08th March 2021, 16:00 Hrs***]

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Aim

In this assignment, you will be converting the given Cartesian x and y coordinates to Polar coordinates r and θ. You will be using few shell commands to work with input arguments in a shell file. The x and y coordinates will be provided as input arguments to the shell script.

The program is ideally expected to print the r and θ coordinates corresponding to the input x and y coordinates upto five decimal places. The θ value can have range from 0 to 360 degrees.

Given

One file is provided to solve this assigment.

- Skeleton program file: `assignment4.sh`

Procedure

- Open the skeleton program file, `assignment4.sh`.

- You will notice pre-written comments included in skeleton program for your assistance to solve the assignment.

- To run and debug your solution, type the below command in Terminal:

  ```
  $ bash assignment4.sh 10 10
  ```

  This command will run the shell script `assignment4.sh` with the x and y coordinates as input arguments.

- Refer the **Expected Output** section below yand debug your code to get the correct output.

Expected Output

- For example, the input arguments of Cartesian coordinates are $x = 10$ and $y = 10$.

- The expected output of program `assigment4.sh` i.e., print the corresponding r and θ values upto 5 decimal places is shown below:

```
14.14214, 45.00000
```

- You can test your solution with following values and their expected outputs:

```
$ bash assignment4.sh -10 10
14.14214, 135.00000

$ bash assignment4.sh -10 -10
14.14214, 225.00000

$ bash assignment4.sh 10 -10
14.14214, 315.00000
```

Grading and Submission Instructions

- Navigate to the folder where the ***ey-mooc-grader-sfc*** application resides.

- To grade your solution, run the `check` command of the application as follows:

```
$ ./ey-mooc-grader-sfc check -w 1 -a 4 Week_1/Assignment_4/assignment4.sh
```

- This will run your program `assignment4.sh` against random test cases and grade it. Marks and appropriate remarks will be provided as shown in Figure 1.

- Your program file `assignment4.sh`, marks scored and remarks will get uploaded to the MOOC portal.
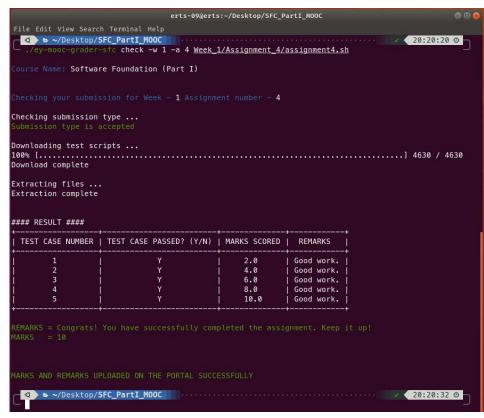

Figure 1: Output of running check command for Week 1 Assignment 4

- You can verify this by running the `status` command of the application as given below, refer Figure 2.

```
$ ./ey-mooc-grader-sfc status -w 1 -a 4
```


Figure 2: Output of running status command for Week 1 Assignment 4

References

- Nano Editor
    - How to use Nano Text Editor
    - Nano Editor Official Docs
- Vim Editor
    - Interactive Vim Tutorial
- Passing arguments to Bash script
    - Bash Scripting Tutorial
- Bash Arithmetic
    - Bash Arithmetic Operations
    - Basic Calculator (bc) command manual
    - bc command examples
    - Arithmetic Comparisons
- Bash Conditional Statement
    - Syntax and use of Conditional Statments in Bash
    - Shell Scripting Tutorial on Conditional Statements

All The Best!