Computer Engineering Department

TED University

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CMPE 252 - C Programming, Spring 2021

Lab 1

Part 1 (25 points)

Write a recursive function

```
void printPowersInRange(int n, int p, int minVal, int maxVal)
```

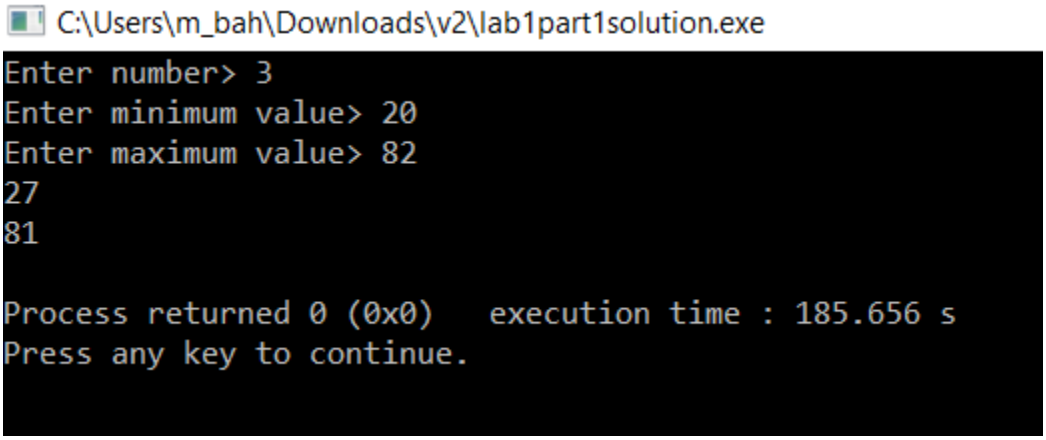
that prints all integer powers of `n` greater than or equal to `p` where they are in range [`minVal` `maxVal`], inclusively.

Assume that

- n is an integer greater than 1.
- `minVal` and `maxVal` are positive integers where `maxVal` >= `minVal`.

Your task in this part to fill in the missing function definition in skeleton code `lab1part1.c`. The remaining part of the code (such as `main` function) will stay as it is.

Here are example runs of the program:



Part 2 (75 points)

In this part, you are going to implement the following function in skeleton code **`lab1part2.c`**:

```
readPointsFindMinMaxTotalLineLength(double *minLengthp, double *maxLengthp,
double *totalLengthp);
```

This function is supposed to do the following tasks:

- Read x and y coordinate of points using **`scanf`** function.
- Compute length of lines between each pair of consecutive points.
    - The length of a line between two points with coordinates (x1, y1) and (x2, y2) can be computed as follows:

$$\sqrt{(x1 - x2)^2 + (y1 - y2)^2}$$

- Find minimum, maximum and total length of the lines.
- Output computed values through the pointer variables listed in the function's formal parameter list.

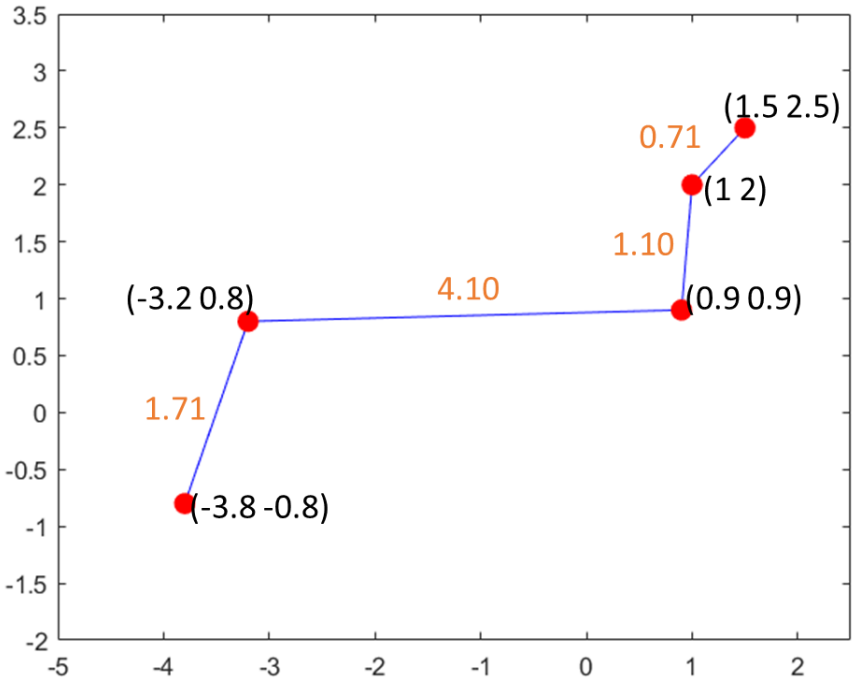
Your task in this part to fill in the missing function definition in skeleton code **`lab1part2.c`**. The remaining part of the code (such as **`main`** function) will stay as it is.

Here is a sample run of the program:

```
1.5 2.5
1 2
0.9 0.9
-3.2 0.8
-3.8 -0.8
^Z
Total length of line segments 7.62
Minimum length of line segments 0.71
Maximum length of line segments 4.10

Process returned 0 (0x0)   execution time : 38.644 s
Press any key to continue.
```

The figure below shows the points listed in the run above along with length of the lines between consecutive pair of points. The points are shown with red color. Lines between consecutive points are shown with blue color. Length of the lines are written using orange color.



Assume that there are at least two points in the input.

Here is another sample run in which there are two points in the input:

```
C:\Users\m_bah\Downloads\v2\lab1part2solution.exe
1.5 -3.2
-0.2 3.1
^Z
Total length of line segments 6.53
Minimum length of line segments 6.53
Maximum length of line segments 6.53

Process returned 0 (0x0)   execution time : 18.500 s
Press any key to continue.
```