PROBLEM:
Write a program to compute the perimeter of a polygon using an input data file and an output file. A file **lab3.c** is provided with some of the print statements in it.
Copy the need files (lab3.c, lab3.dat, lab3sample.dat).
Move to your **csc60** directory.
Type: **`cp /gaia/home/faculty/bielr/classfiles_csc60/lab3* .`**
^space space ^ & then dot

After the files are in your account, you need to type: **chmod 644 lab3***

INPUT/OUTPUT DESCRIPTION:
- **The input** will be a file called **lab3.dat**.
- Each line or record of the file will consist of two numbers: the number of sides of the polygon and the radius of the surrounding circle.
- Use an *fscanf* statement in a *while* loop to repeatedly get each set of values.
- **The output** will be a file, **lab3.txt**, showing on each line, the radius, the number-of-sides, and the perimeter and area of the polygon.

ALGORITHM DEVELOPMENT:
Open the data file **lab3sample.dat** or **lab3.dat**
  Do the appropriate error checking
Open the output file **lab3.txt**
  Do the appropriate error checking
Print your name and the column header lines needed

while ((fscanf(..., &radius, &nsides)) == 2)
| Compute the perimeter and area of the polygon.
| print the radius, nsides, perimeter, and area.
|_
Close the two files

REMINDERS:
Include your name and lab3 in your comment block, and in your output.
All numeric variables are to be type **double**.
The input file name, which will be changed, ought to be in a #define statement.
Most of the print and fprintf statements are included in lab3.c for you. You need to write the fprintf in the loop.
FOR THE VALUE OF PI, use **M_PI** from math.h (which we already have included).
To compile, you will need to add **–lm** so math.h can be found. Type: **gcc –lm lab3.c**

➔ more on next page

Remember to translate the algebra of the two formulas into the C language.

Perimeter of the polygon = $2n\ R \sin \frac{PI}{n}$ Area = $\frac{1}{2}\ n\ R^2 \sin \frac{2\ PI}{n}$

VIEWING OUTPUT

When you run the program, the whole thing is going to lab3.txt.
Open that file to see your output.

DEFINED OUTPUT APPEARANCE (*using lab3sample.out*):

```
Your Name.  Lab 3.

            Number      Perimeter      Area Of
 Radius    Of Sides    Of Polygon      Polygon
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  12.60      24.00        78.9422      493.0813
   5.60       8.00        34.2884       88.6995
   7.85      12.00        48.7615      184.8675
```

DATA FILE:

There are two data files:

1. lab3sample.dat – Use it to verify the correctness of your program
2. lab3.dat

PREPARE YOUR FILE FOR GRADING:

Make sure your program has been corrected to use **lab3.dat** and has been re-complied.

When all is well and correct, type: **script StudentName_lab3.txt**
[Script will keep a log of your session.]
At the prompt, type: **cat lab3.c** to display the code in your session.
At the prompt, type: **a.out** to run the program
After the program run is complete,
type: **exit** to leave the script session

Turn in your completed session:

Go to SacCT and turn in your session (StudentName_lab3.txt).