Assignment2 - WRITEUP.pdf

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Abstract

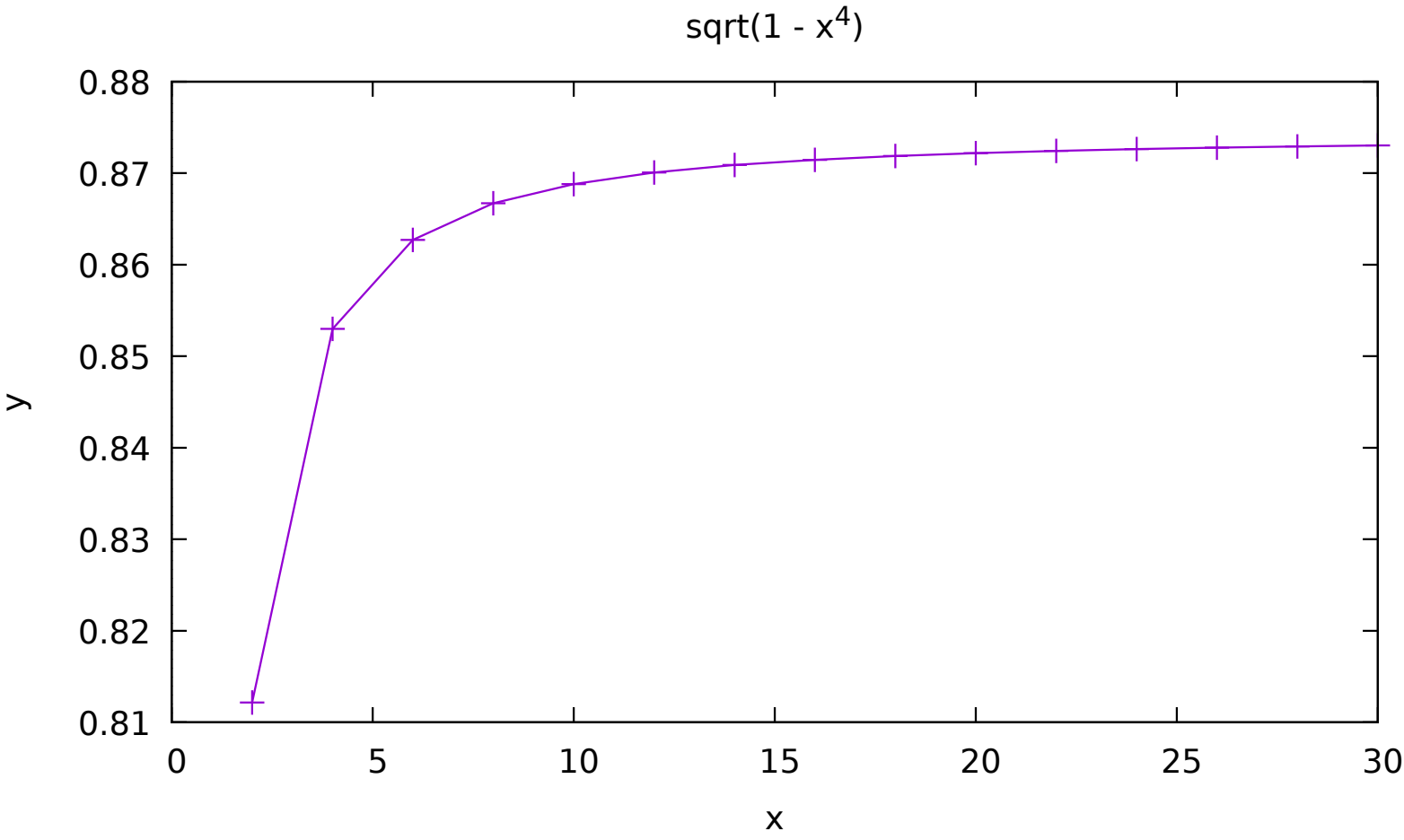
This writeup will include the plots that I produced using my bash script, as well as discussion on which UNIX commands I used to produce each plot and why am I chose to use the them.

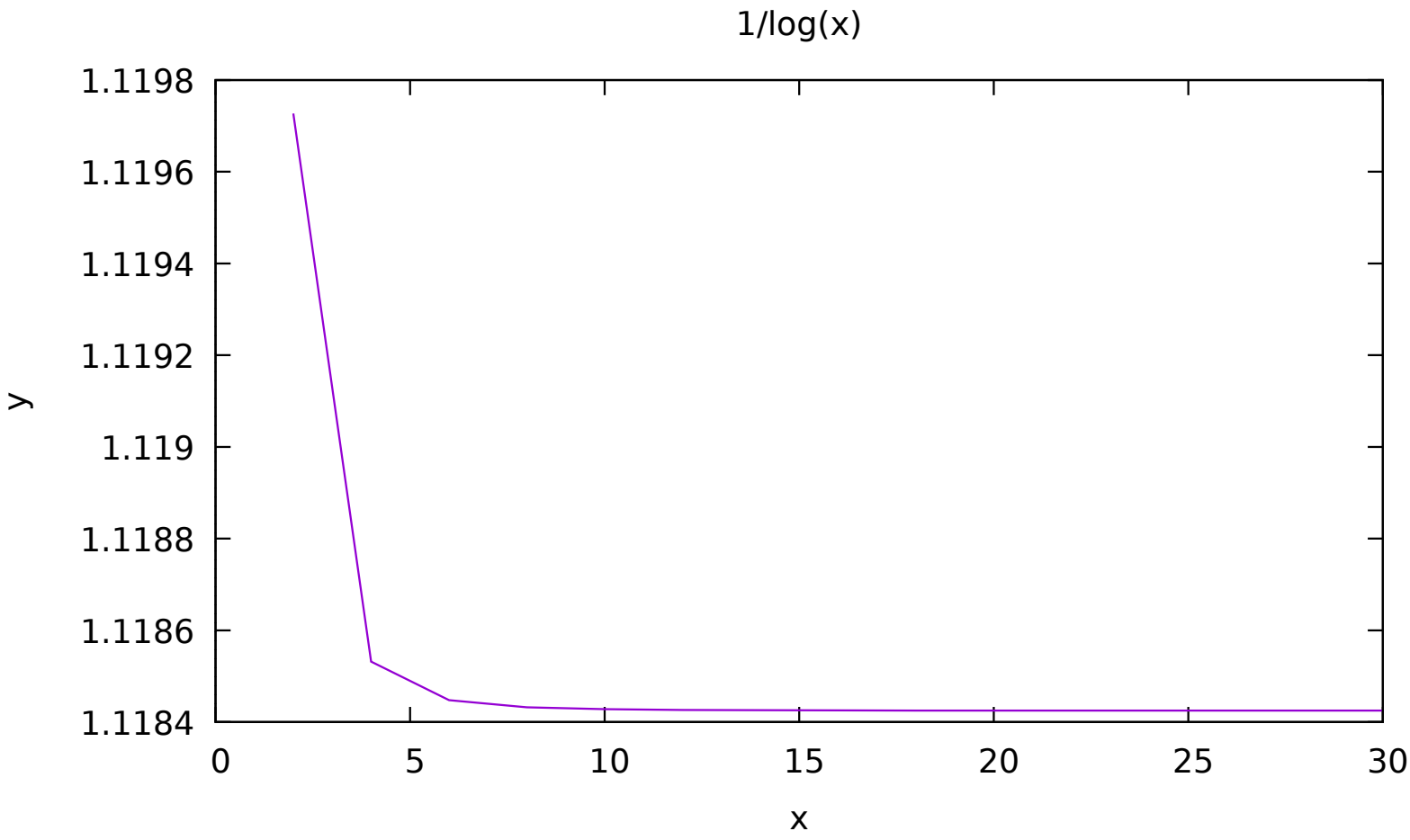
1 Introduction

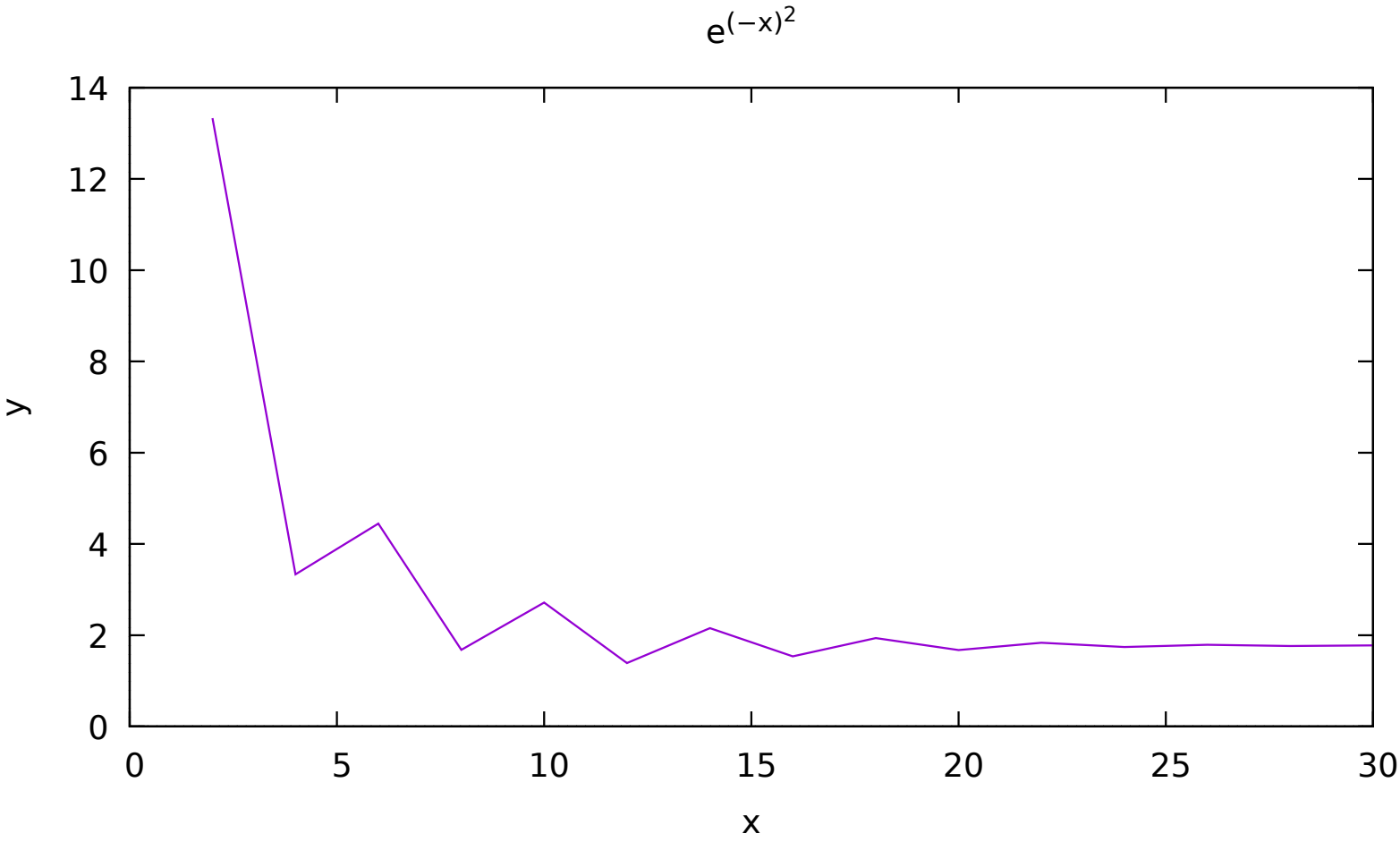
This WRITEUP.pdf will include 10 plots using gnuplots and the analysis of the produced graphs and any lessons that you learned about floating-point num-bers.

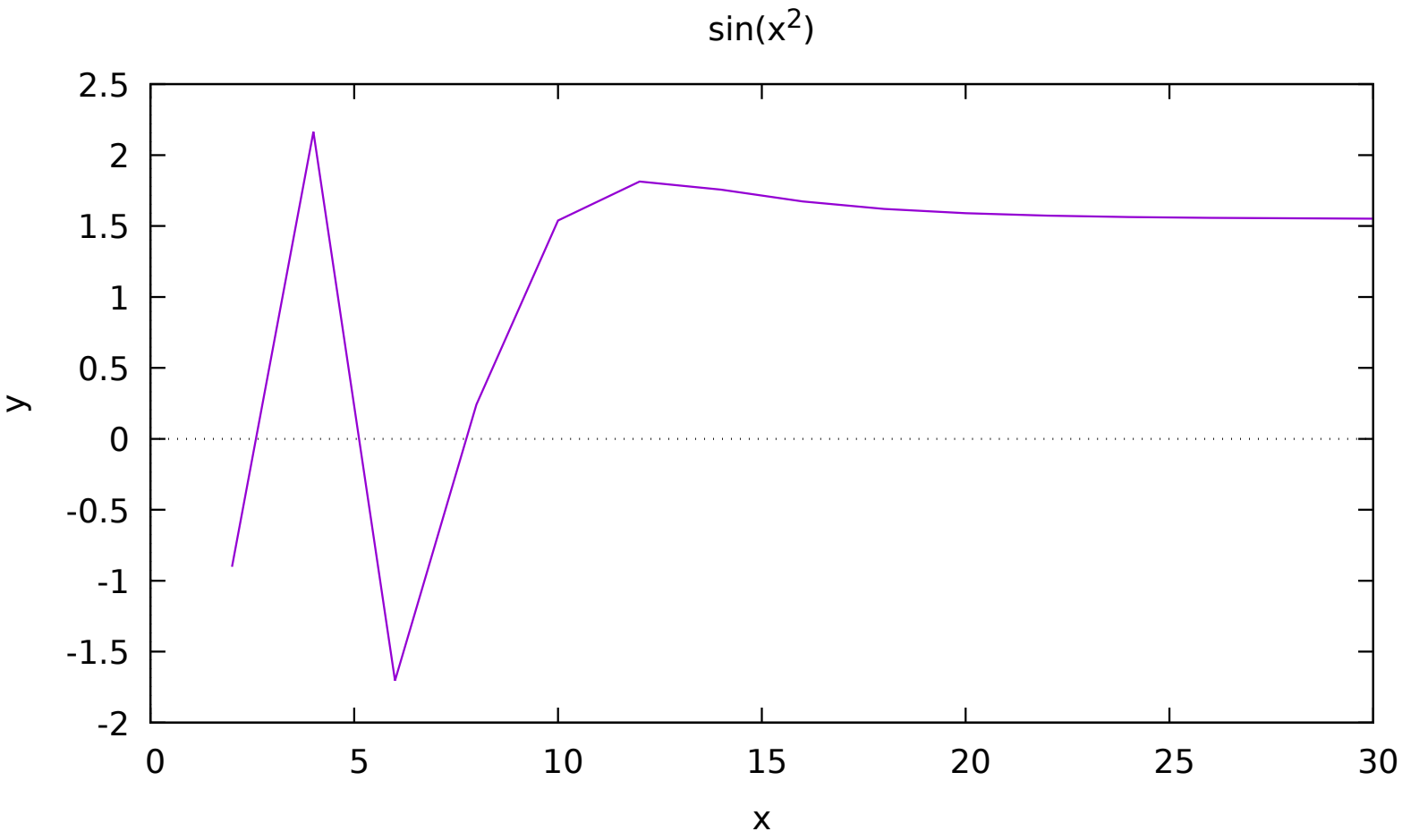
2 Figures

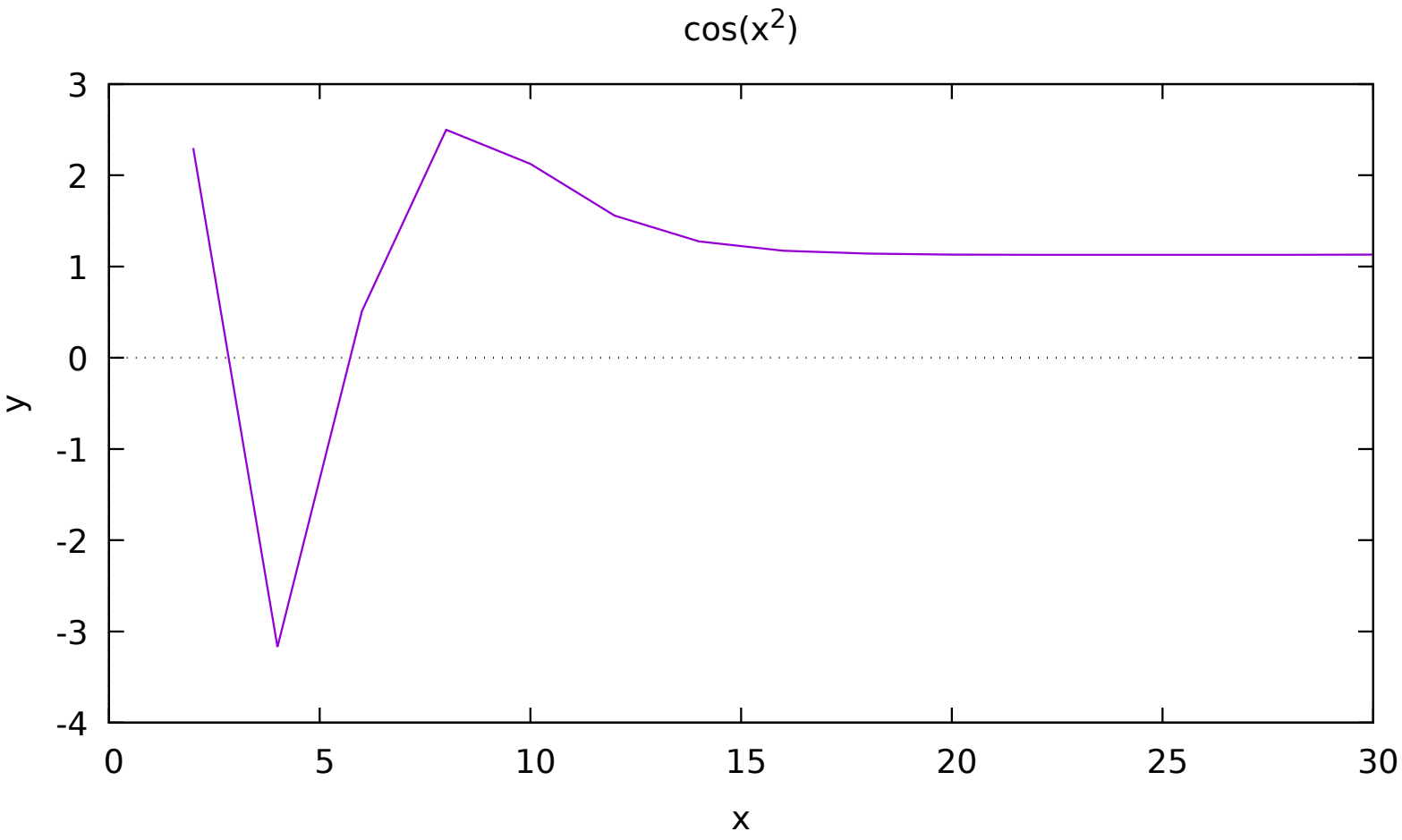
There are the ten plots that I produced using my bash script. I use Latex to to insert the PDF of my plots into this WRITEUP file.

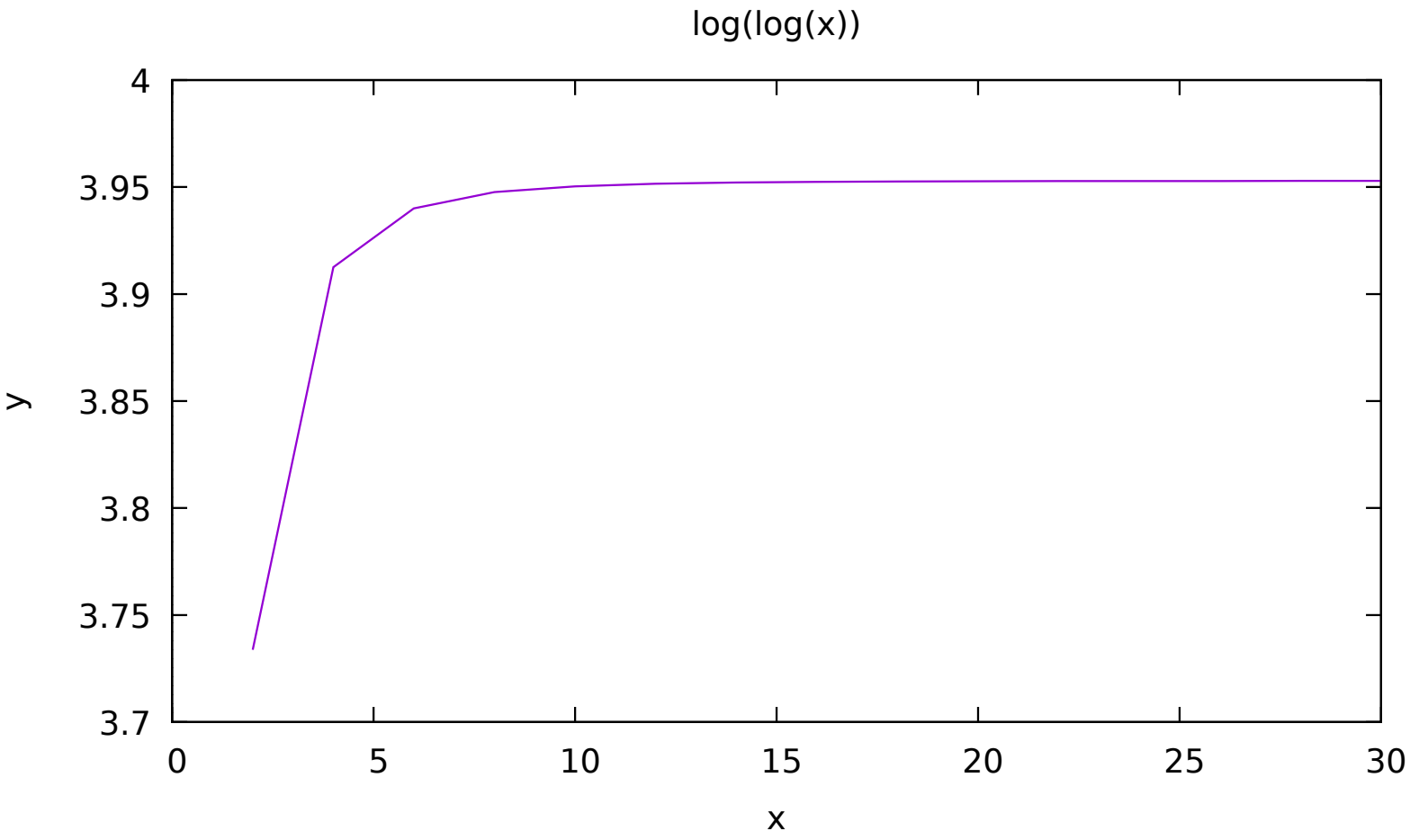

sqrt(1 - x^4)
0.88
0.87
0.86
0.85
0.84
0.83
0.82
0.81
y
0
5
10
15
20
25
30
x

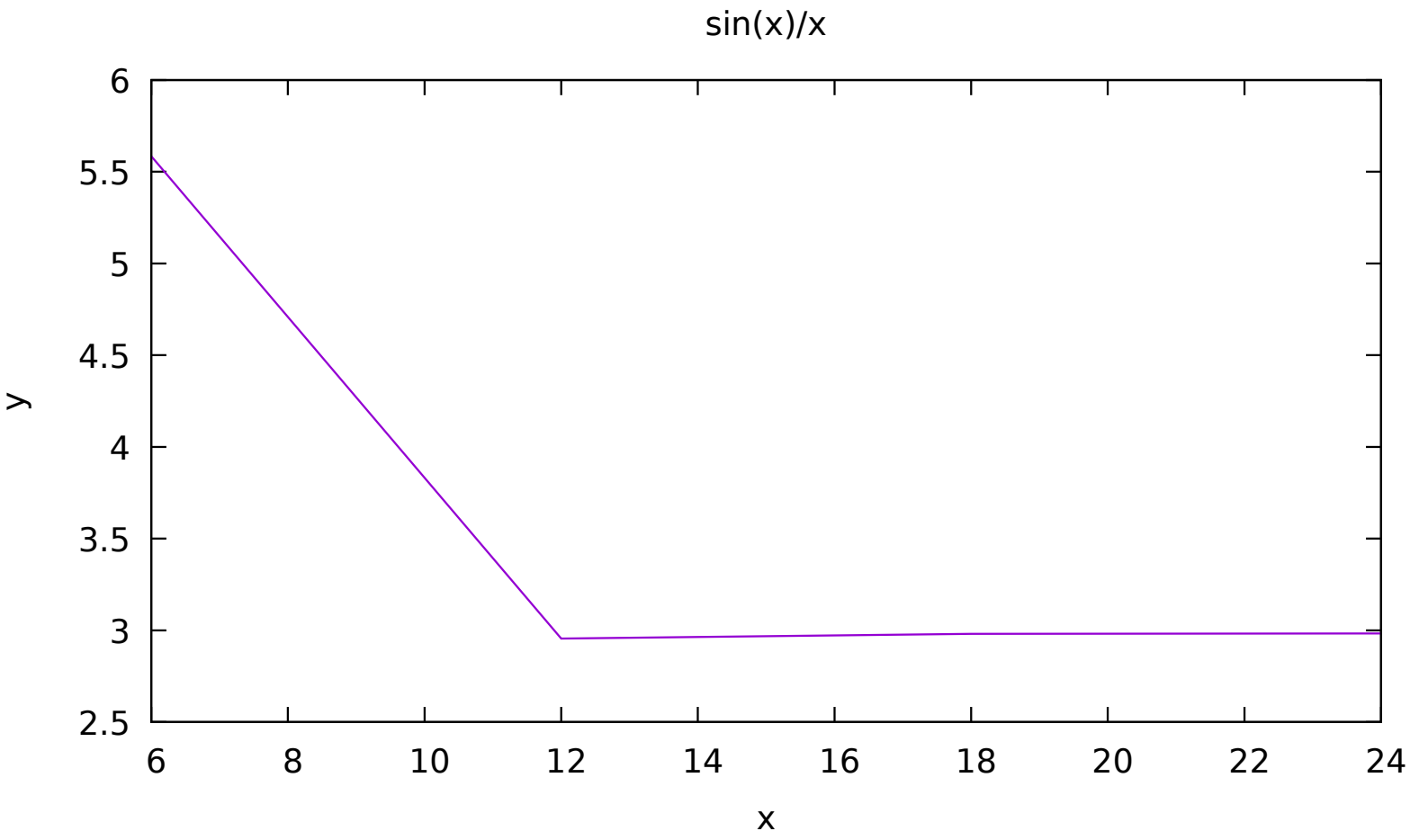

1/log(x)
1.1198
1.1196
1.1194
1.1192
1.119
1.1188
1.1186
1.1184
y
0
5
10
15
20
25
30
x

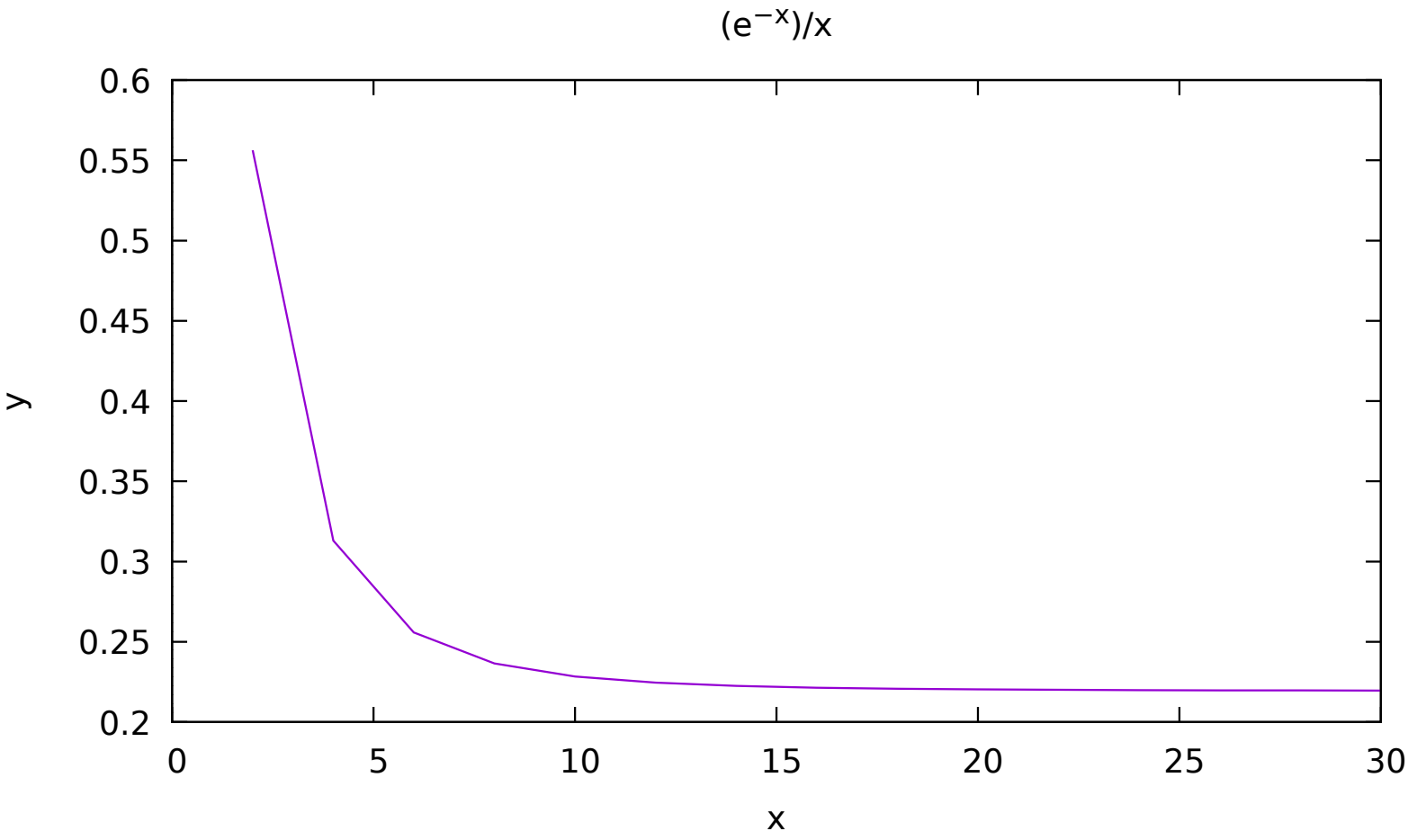

e^(−x)^2
14
12
10
8
6
4
2
0
y
0
5
10
15
20
25
30
x

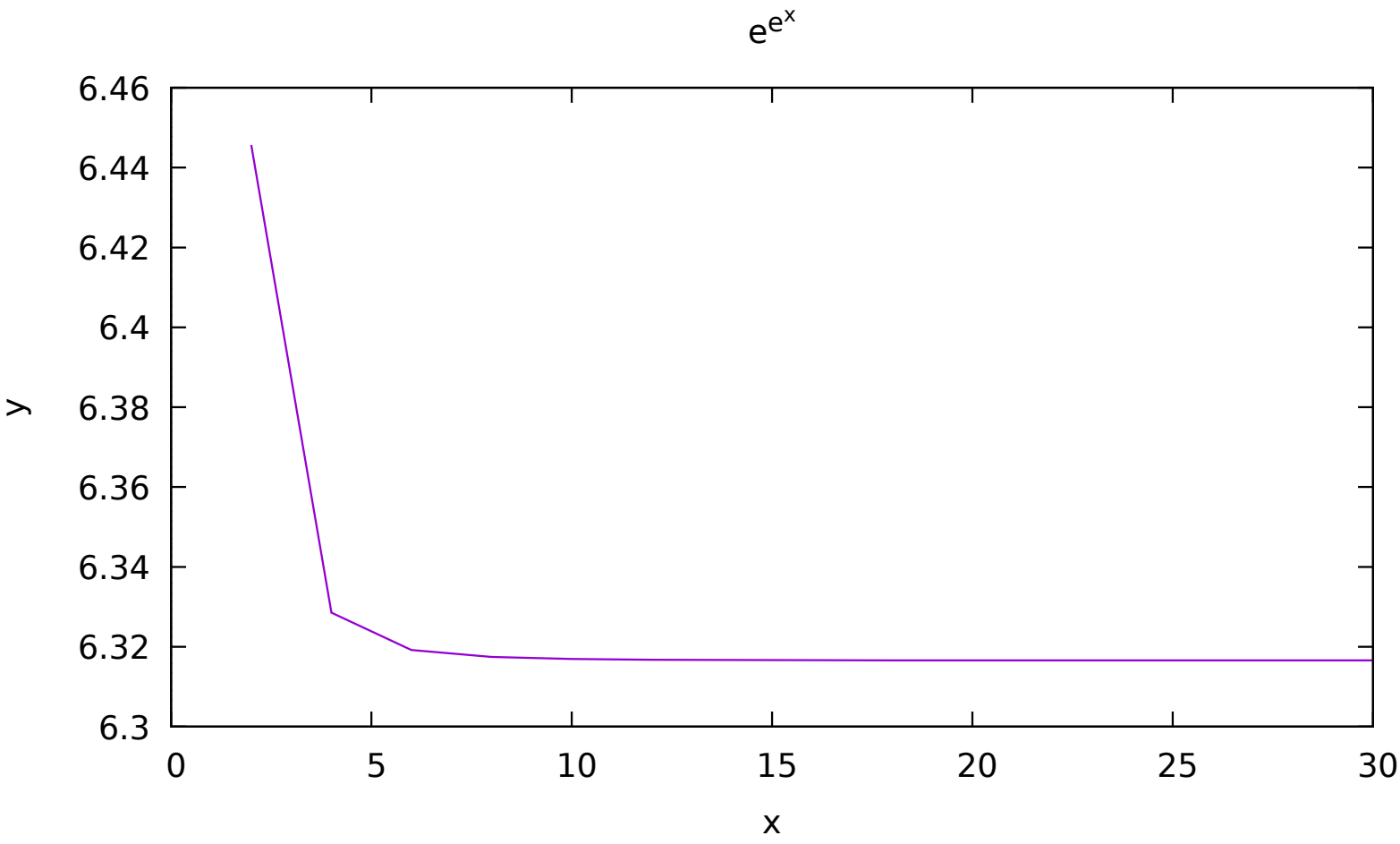

sin(x^2)
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
y
0
5
10
15
20
25
30
x

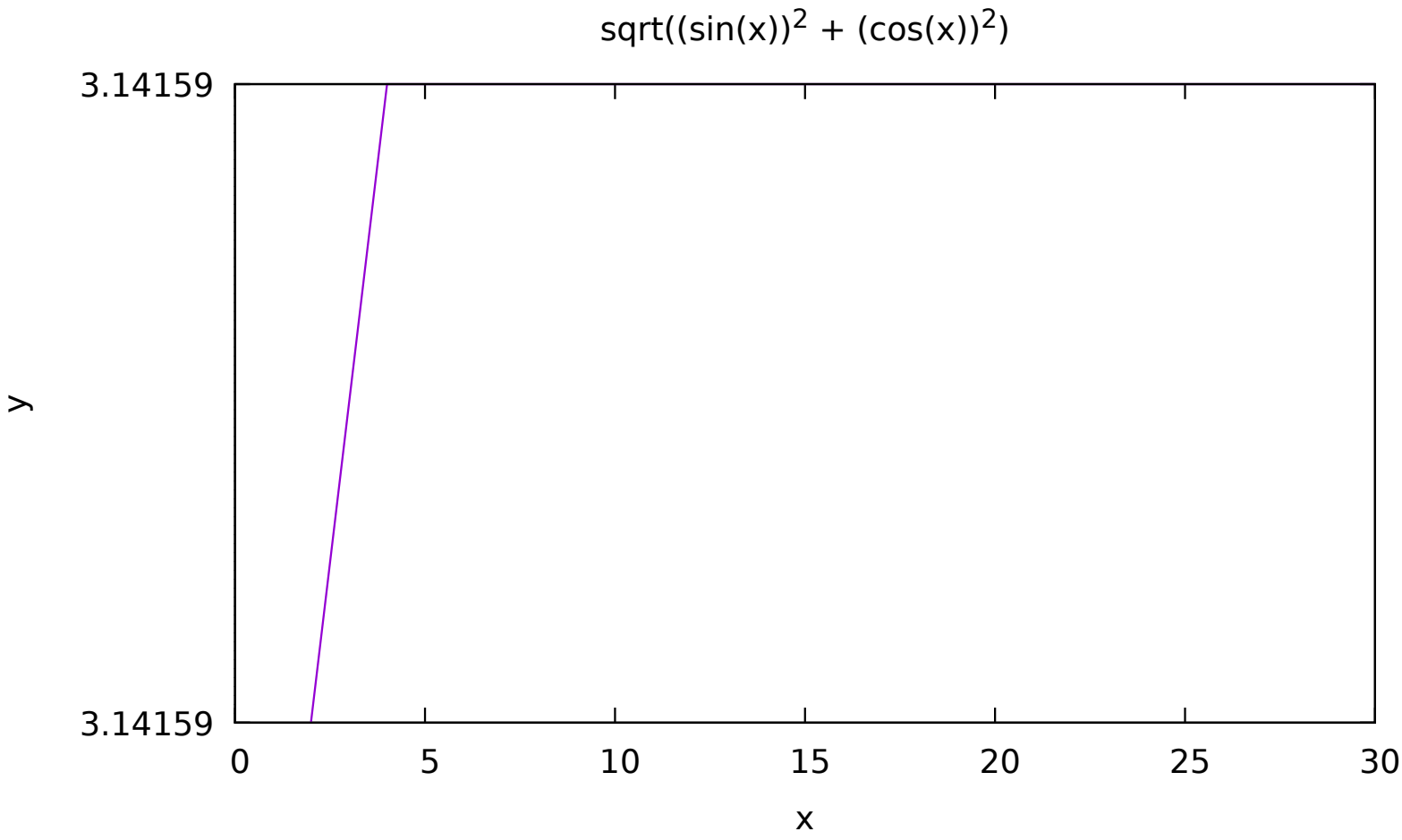

cos(x^2)
3
2
1
0
-1
-2
-3
-4
y
0
5
10
15
20
25
30
x


log(log(x))
4
3.95
3.9
3.85
3.8
3.75
3.7
y
0
5
10
15
20
25
30
x


sin(x)/x
6
5.5
5
4.5
4
3.5
3
2.5
y
6
8
10
12
14
16
18
20
22
24
x


(e^−x)/x
0.6
0.55
0.5
0.45
0.4
0.35
0.3
0.25
0.2
y
0
5
10
15
20
25
30
x


e^{e^x}
6.46
6.44
6.42
6.4
6.38
6.36
6.34
6.32
6.3
y
0
5
10
15
20
25
30
x


sqrt((sin(x))^2 + (cos(x))^2)
3.14159
3.14159
y
0
5
10
15
20
25
30
x

3 Analysis of the produced graphs

- I set partitions to 30 which is enough to see the trend. From each graph, we can see that the y value tends to a number as the partition increases. This means that in Simpson's rule, as the partition increases, the integral becomes more precise.

4 lessons that I learned

- I learned how to use getopt() which can accept multiple command-line options.
- strtod() converts the string pointed to by the argument str to a floating-point number (type double).
- strtoul() converts the string pointed to by the argument str to a unsigned integer (type int).
- strtol() converts the string pointed to by the argument str to a signed integer (type int).
- we can use %0.x to define how many decimal places we need to keep. Foe example: %0.2 keep 2 decimal numbers.