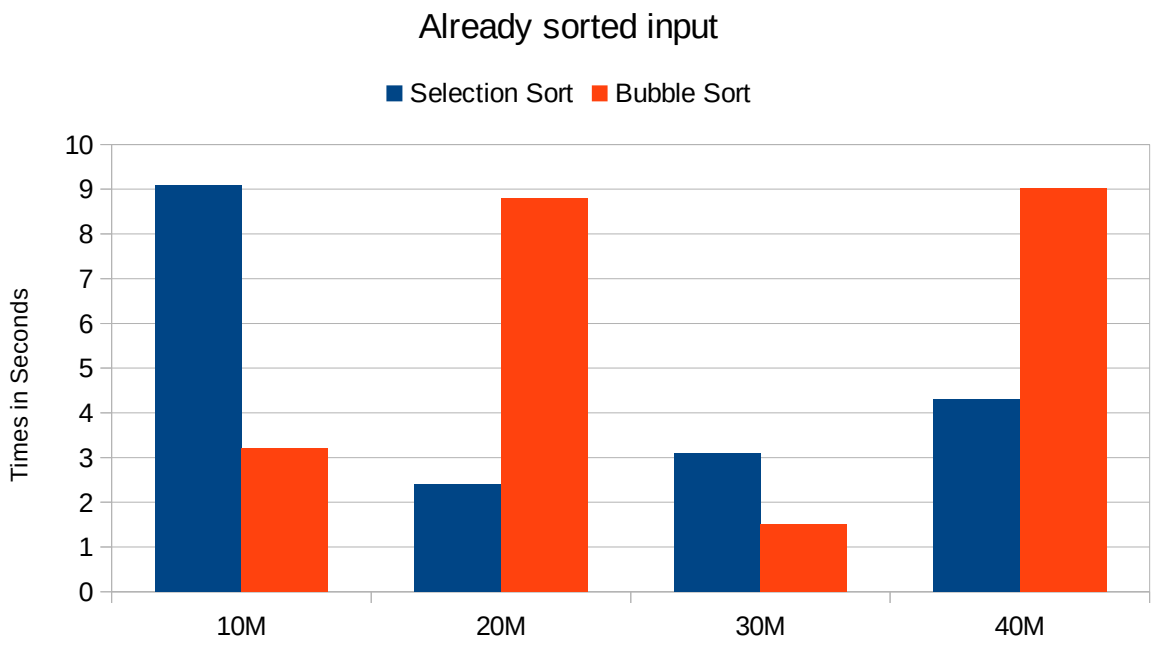
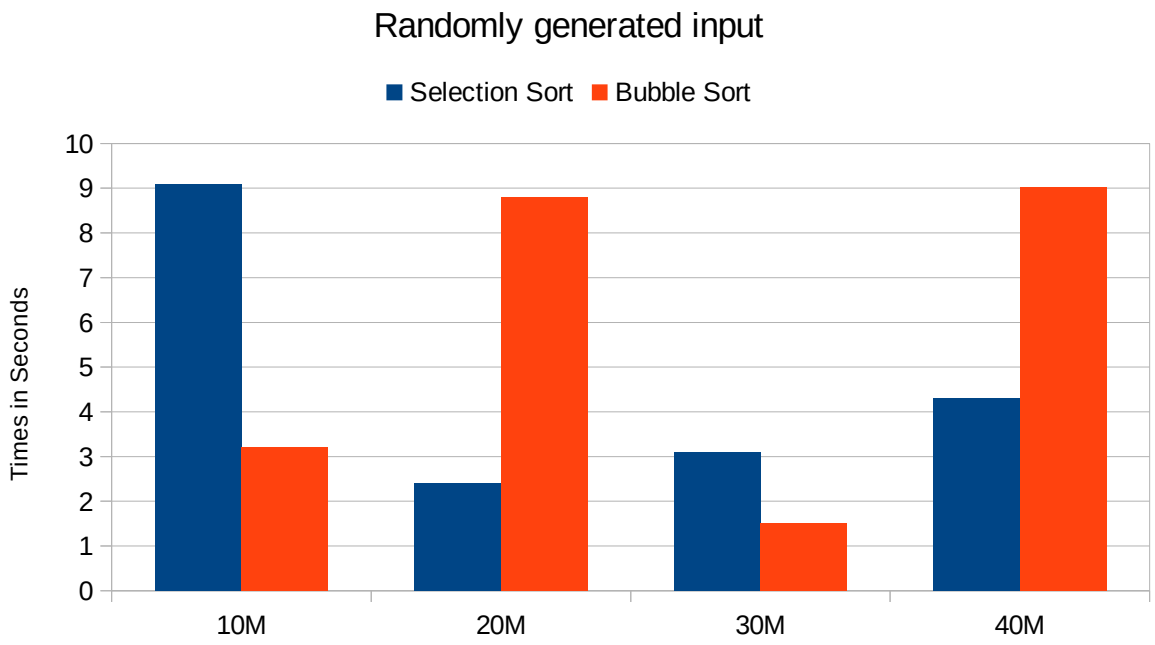
Assignment-I
CS 201
Data Structures

Instructions: *Do not submit the source code to the Google Classroom. Upload your code into the github.com and submit the link of the code to the Google Classroom.*

---

1. Write a C compiler to check whether a given number is a valid floating point number or not. Write for all possible all test cases. Example:
   input: 2.0
   output: valid
   input: 1.
   output: invalid
2. Write a C program to check whether a given email is valid or not. Rules of email ID can be refer to the link https://en.wikipedia.org/wiki/Email_address
3. Let us assume that A is a single dimensional array. You have given A array to construct a two-dimensional array. Write a C program to convert explicitly from 2D array to 1D array. Example, Map(A, i, j) gives you A[i][j]. You can use either row-major order or column-major order.
4. Write a C program to benchmark the performance of Selection Sort and Bubble Sort. Total input items may be randomly generated and already sorted. You have to tell your story using the bar chart as given below for an example.





Note: To measure times, you need to include #include<time.h>

clock_t start, end;
long int t;
start=clock();
Selection sort algorithm
end=clock();

t=end-start;
printf("Total elapsed time : %f", (double)t/(double)CLOCKS_PER_SEC);

Or you can directly measure $time ./a.out

real 0m5.959s
user 0m3.900s
sys 0m2.028s

You need to consider only the real part.