

CECS 424
Assignment 9
Total: 40 Points

General Instruction

- This is a group assignment.
 - Submit uncompressed file(s) via BeachBoard (Not email or in class).
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1. (40 points) Draw a distribution of 32-bit IEEE 754 floating point numbers.
 - i. Form a group with up to 5 students.
 - ii. Find the `Assn9.cpp` and `Assn9.py`.
 - iii. You are asked to implement the function `convertFloat`, `nextFloat` and `countBetween` in `Assn9.cpp`.
 - iv. You can refer Figure 1 and *this site* to have a high level idea of the IEEE 754 format.
 - v. Submit a **source code** and screen shots of the **console output** and the **histogram**, they can be same for all of the group members, but submit them **individually**.

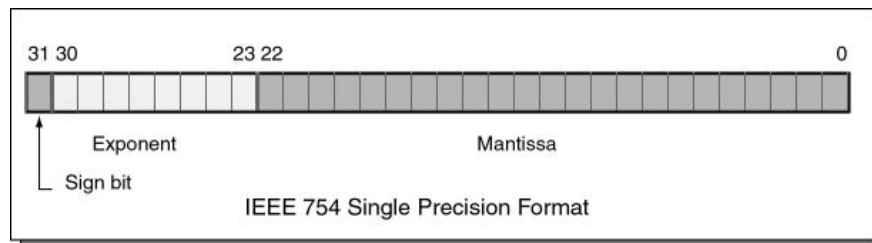


Figure 1: After executing `Python3 Assn9.py count.dat`

Expected output

```
g++ Assn9.cpp -o Assn9.exe; .\Assn9.exe count.dat
```

```
i. Floating point number converter.
```

```
3.14159 -> (0,128,4788187)
```

```
ii. Floating point number enumeration.
```

```
1th number: 1.4013e-045
```

```
2th number: 2.8026e-045
```

```
3th number: 4.2039e-045
```

```
4th number: 5.60519e-045
```

```
5th number: 7.00649e-045
```

```
6th number: 8.40779e-045
```

```
7th number: 9.80909e-045
```

```
8th number: 1.12104e-044
```

```
9th number: 1.26117e-044
```

```
10th number: 1.4013e-044
```

```
iii. Floating point number counting
```

```
Number of positive floating point numbers: 2139095039
```

```
Number of floating point numbers between 0 and 1: 1065353216
```

```
Proportion (# of 0~1) / (# of positive): 49.8039%
```

```
iv. Floating point number distribution
```

```
The output file is ready. Execute "Python3 Assn9.py count.dat"
```

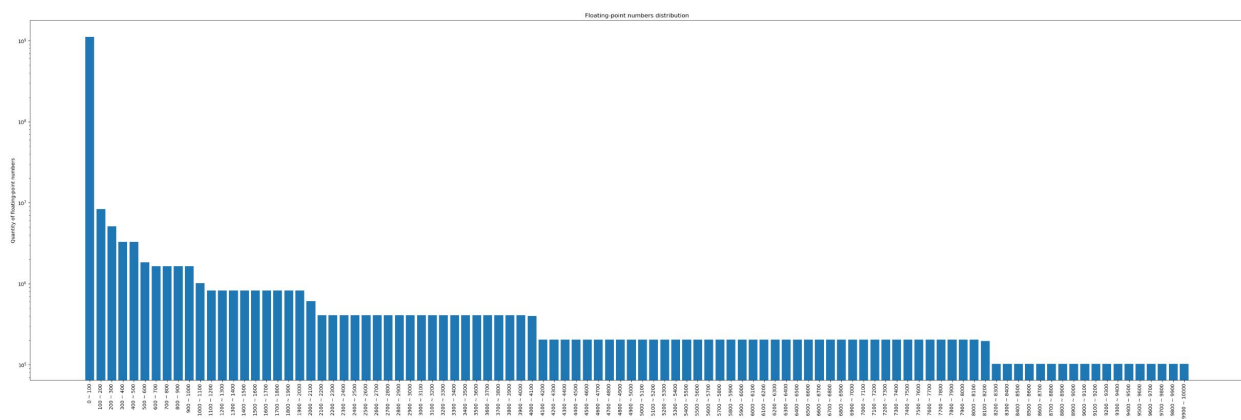


Figure 2: After executing `Python3 Assn9.py count.dat`