Q1 Report
170050068, 170050081, 170050083, 170050100

The Biases represented as the number of times the XOR value of a selected input-output combination is even. It is easy to understand with an example.

For example:

First consider the case where the combination is of even length

Consider the input output combination with values 1,0,0,1
1 ^ 0 ^ 0 ^ 1 = 0

There is the value 0,1,1,0 which is the complement of the above sequence and the xor value is the same as before, we can say that these inputs exist in pairs, and when counting the number of times the xor value is zero, we get even numbers.

Now consider the case where the combination is of odd length.

For the input output combination sequence with values 0,1,0,1,0
0 ^ 1 ^ 0 ^ 1 ^ 0 = 0

Considering all the but flip combinations with one zero not being flipped, we get an odd number of such combinations, since there will be an odd number of zeros when xor=0.

We get (0,0,1,0,1) , (1,0,0,0,1) , (1,0,1,0,0).

These even number of combinations have xor value to zero, we can say that for any sequence with xor=0, we can form a group of size even where all of them evaluate to zero.
Hence when counting the number of times the xor is zero over all values, we get even numbers.

Bias Table:

Bias	**Count**		**Bias**	**Count**
112	640		130	6128
114	2040		132	4588
116	4592		134	5104

118	3064		136	4336
120	4334		138	3056
122	5096		140	4588
124	4592		142	2040
126	6112		144	635
128	4080		Others	0

Time Complexity:
O(2^8 * 2^8 * 2^8 * 2^3) = O(2^27)

One loop for the combination of 8-bit input O(2^8)
One loop for the combination of 8-bit output O(2^8)
One loop for each input value in 0-255 O(2^8)
Computing XOR of all bits of 8bit value O(2^3)

Approximately 26 seconds for the program to complete.

Histogram: