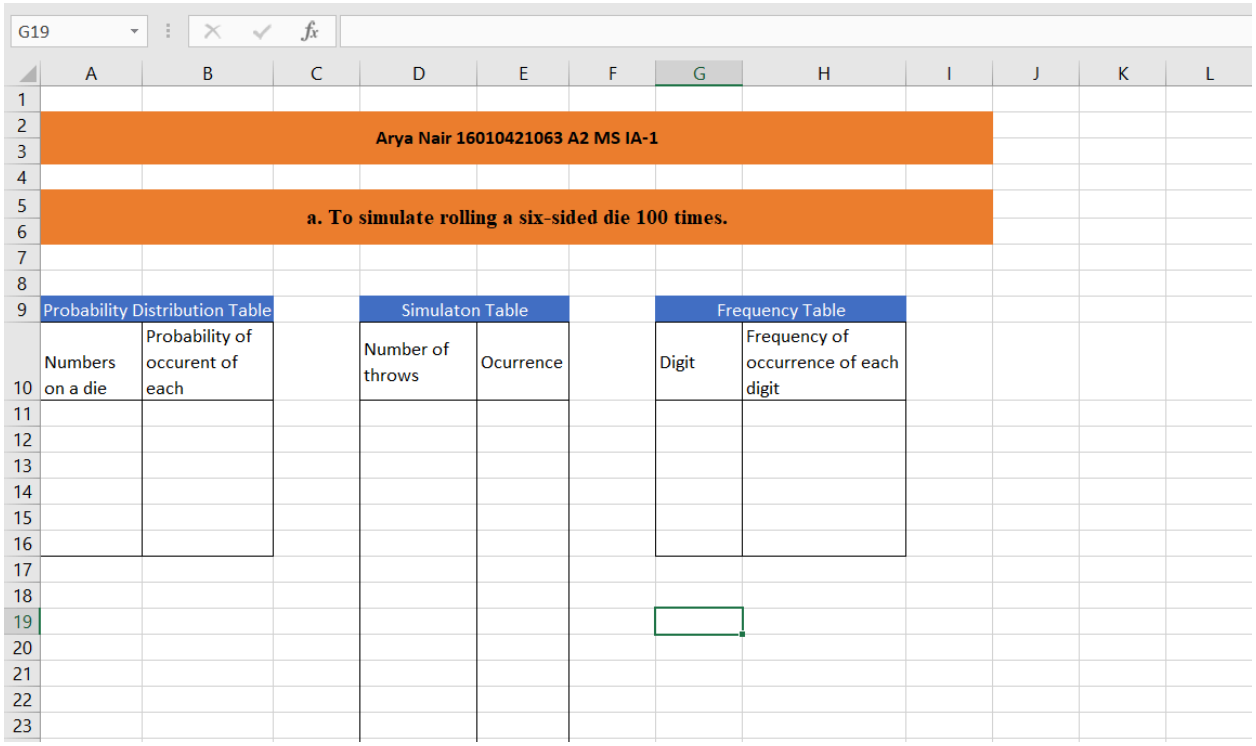
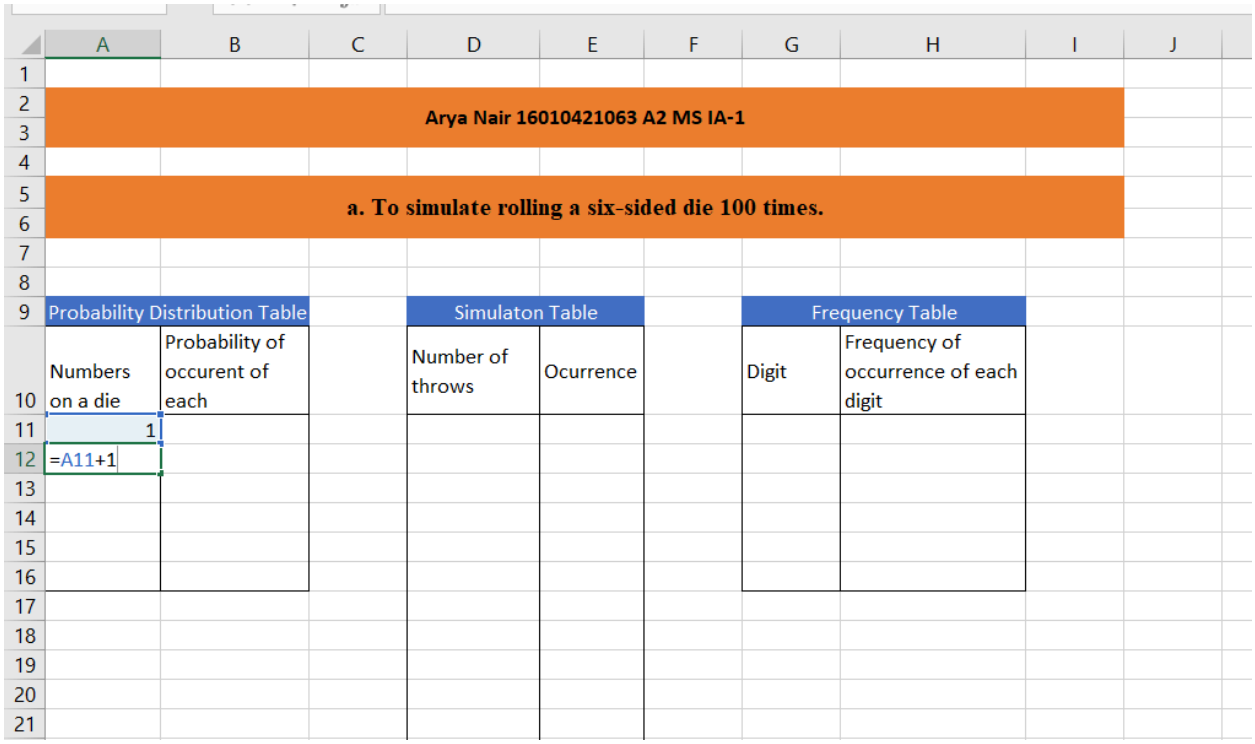
MS IA-1
Name: Arya Nair
Roll Number: 16010421063
Branch: IT
Division: A
Batch: A2

a. To simulate rolling a six-sided die 100 times.

1) Creating required tables and naming the columns

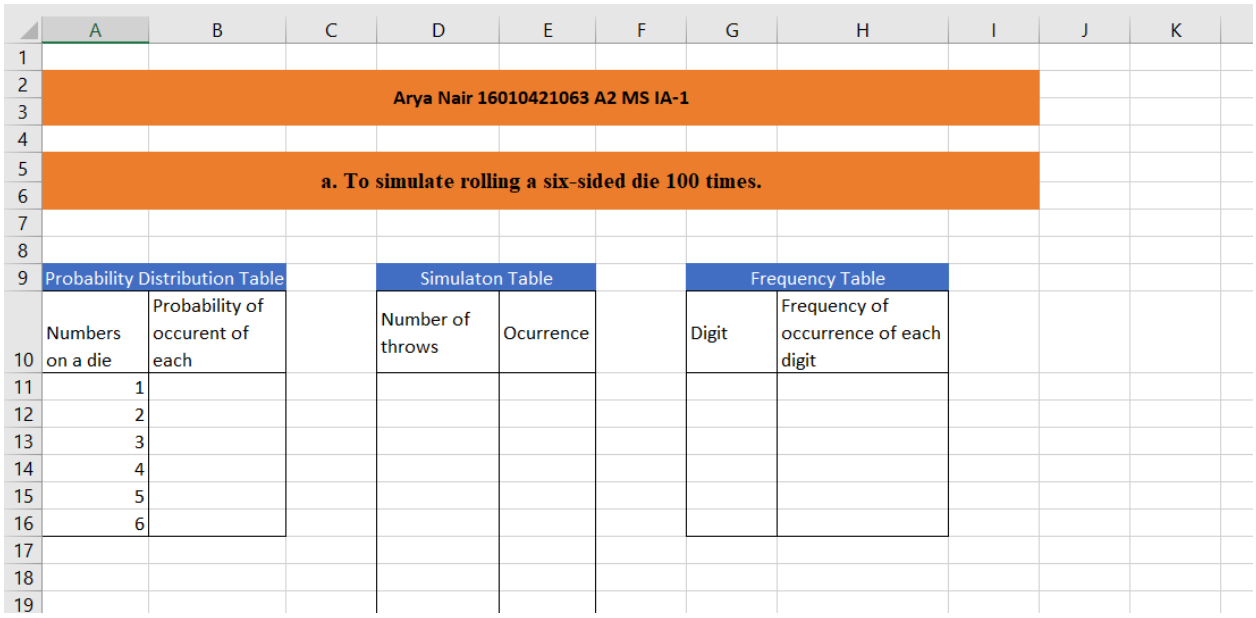


2) Applying Formulae to generate-



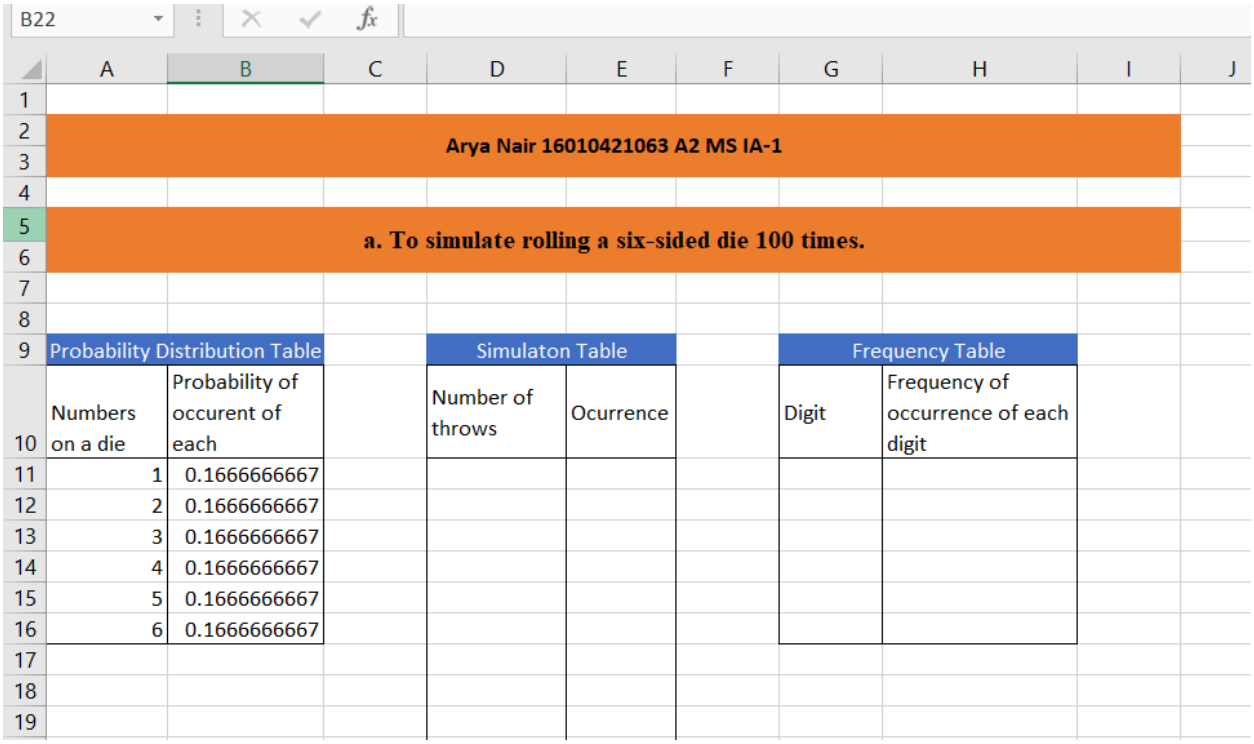
	A	B	C	D	E	F	G	H	I	J
1										
2	Arya Nair 16010421063 A2 MS IA-1									
3										
4										
5	a. To simulate rolling a six-sided die 100 times.									
6										
7										
8										
9	Probability Distribution Table			Simulaton Table			Frequency Table			
10	Numbers on a die	Probability of occurent of each		Number of throws	Ocurrence		Digit	Frequency of occurrence of each digit		
11	1									
12	=A11+1									
13										
14										
15										
16										
17										
18										
19										
20										
21										

Dragging down



	A	B	C	D	E	F	G	H	I	J	K
1											
2	Arya Nair 16010421063 A2 MS IA-1										
3											
4											
5	a. To simulate rolling a six-sided die 100 times.										
6											
7											
8											
9	Probability Distribution Table			Simulaton Table			Frequency Table				
10	Numbers on a die	Probability of occurent of each		Number of throws	Ocurrence		Digit	Frequency of occurrence of each digit			
11	1										
12	2										
13	3										
14	4										
15	5										
16	6										
17											
18											
19											

Probability of occurrence of each number =1/6 -



Arya Nair 16010421063 A2 MS IA-1

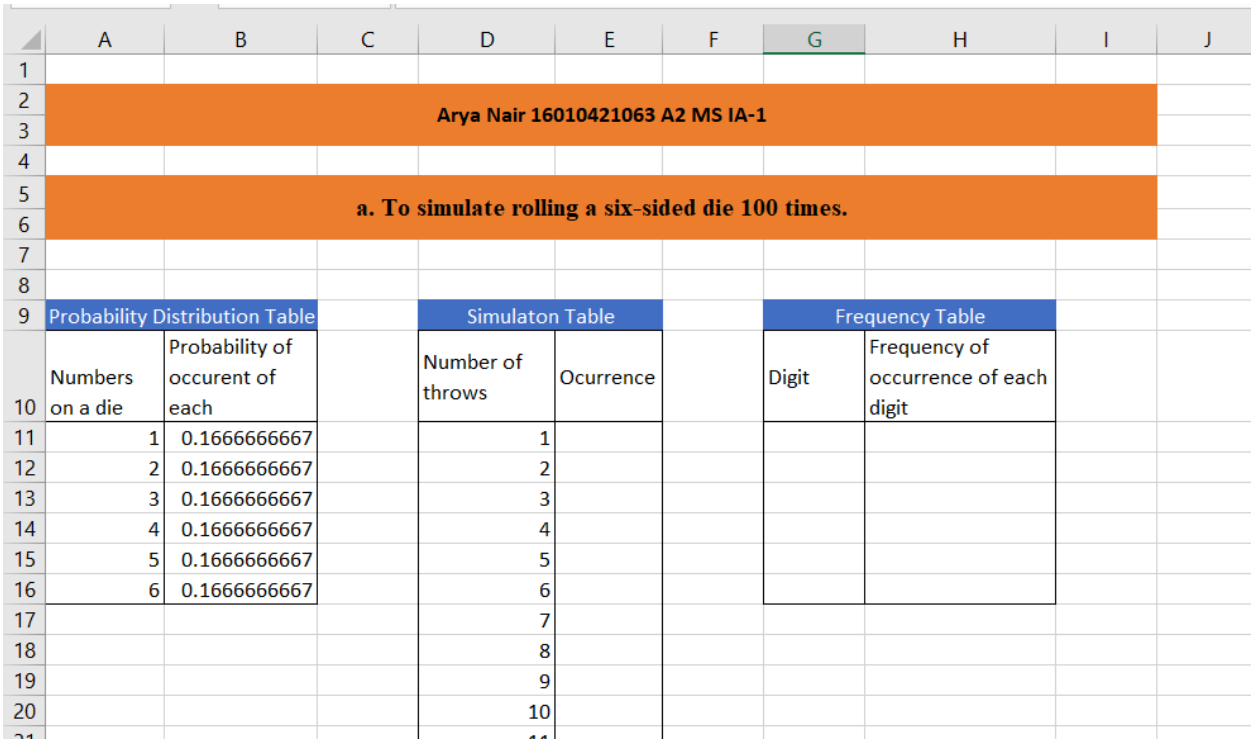
a. To simulate rolling a six-sided die 100 times.

Probability Distribution Table	
Numbers on a die	Probability of occurent of each
1	0.1666666667
2	0.1666666667
3	0.1666666667
4	0.1666666667
5	0.1666666667
6	0.1666666667

Simulaton Table	
Number of throws	Ocurrence

Frequency Table	
Digit	Frequency of occurrence of each digit

Number of throws (D11+1)-



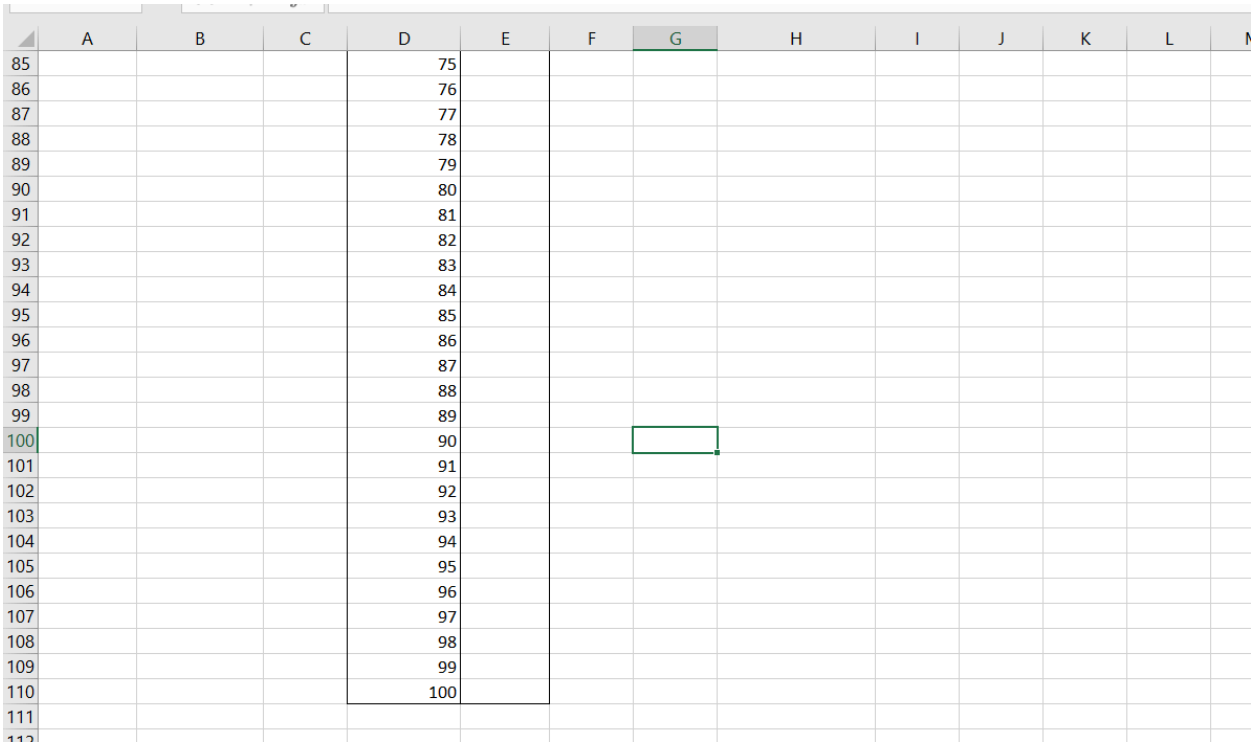
Arya Nair 16010421063 A2 MS IA-1

a. To simulate rolling a six-sided die 100 times.

Probability Distribution Table	
Numbers on a die	Probability of occurent of each
1	0.1666666667
2	0.1666666667
3	0.1666666667
4	0.1666666667
5	0.1666666667
6	0.1666666667

Simulaton Table	
Number of throws	Ocurrence
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Frequency Table	
Digit	Frequency of occurrence of each digit

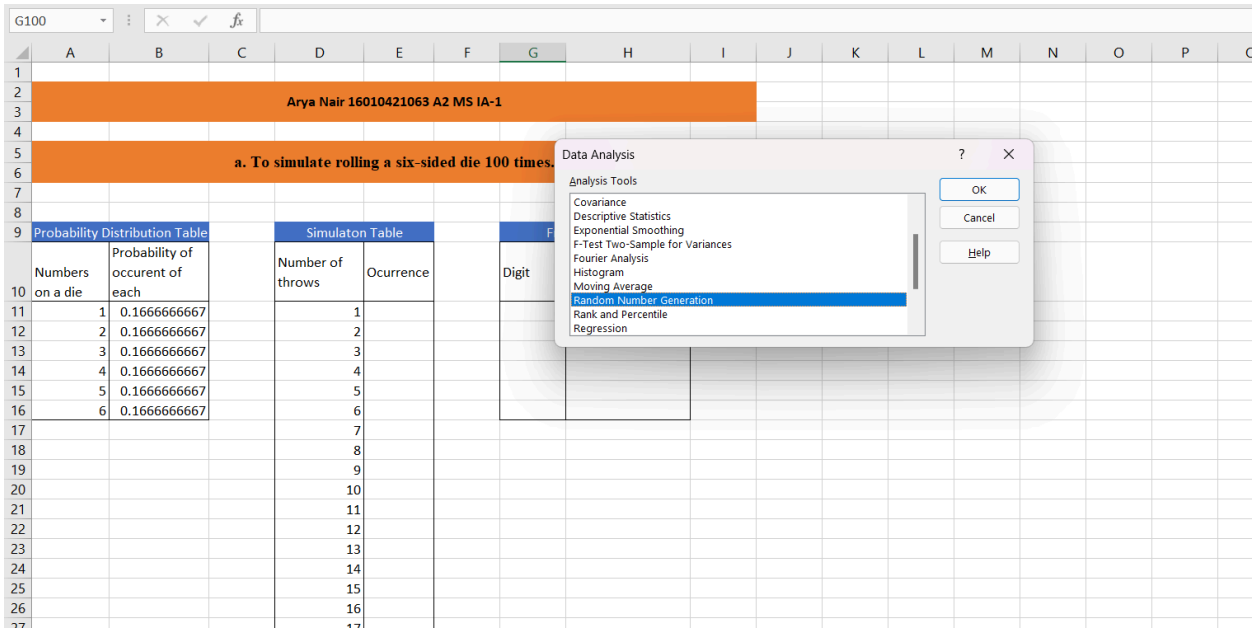


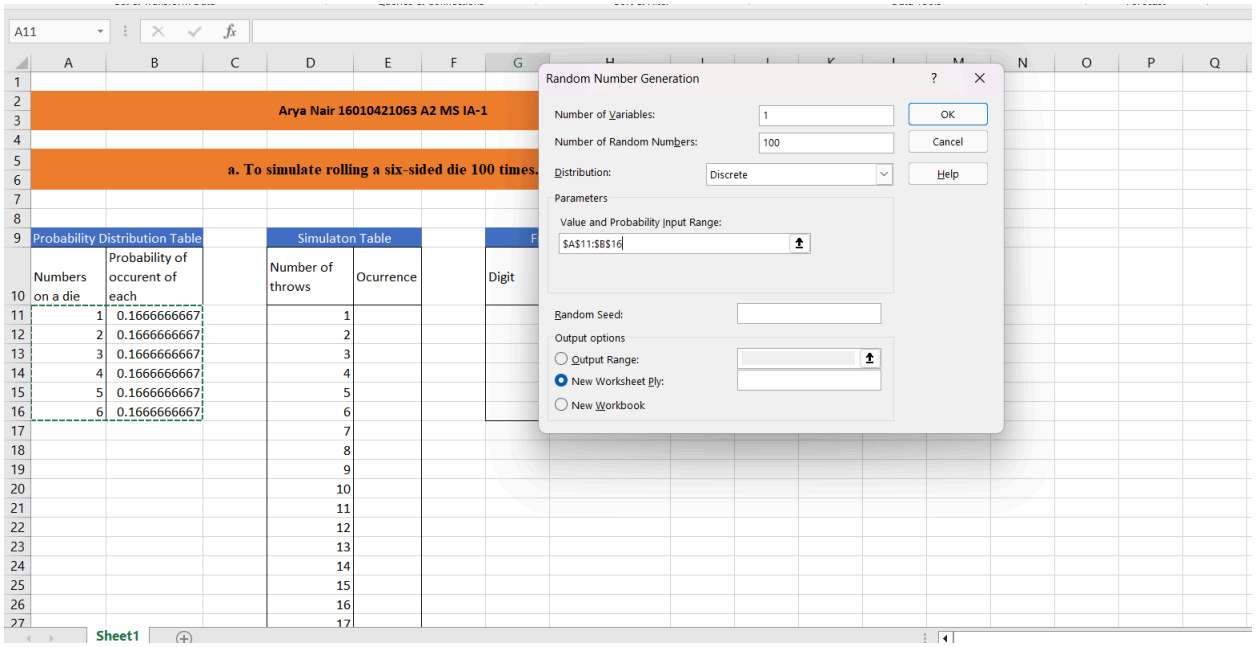
	A	B	C	D	E	F	G	H	I	J	K	L
85				75								
86				76								
87				77								
88				78								
89				79								
90				80								
91				81								
92				82								
93				83								
94				84								
95				85								
96				86								
97				87								
98				88								
99				89								
100				90								
101				91								
102				92								
103				93								
104				94								
105				95								
106				96								
107				97								
108				98								
109				99								
110				100								
111												

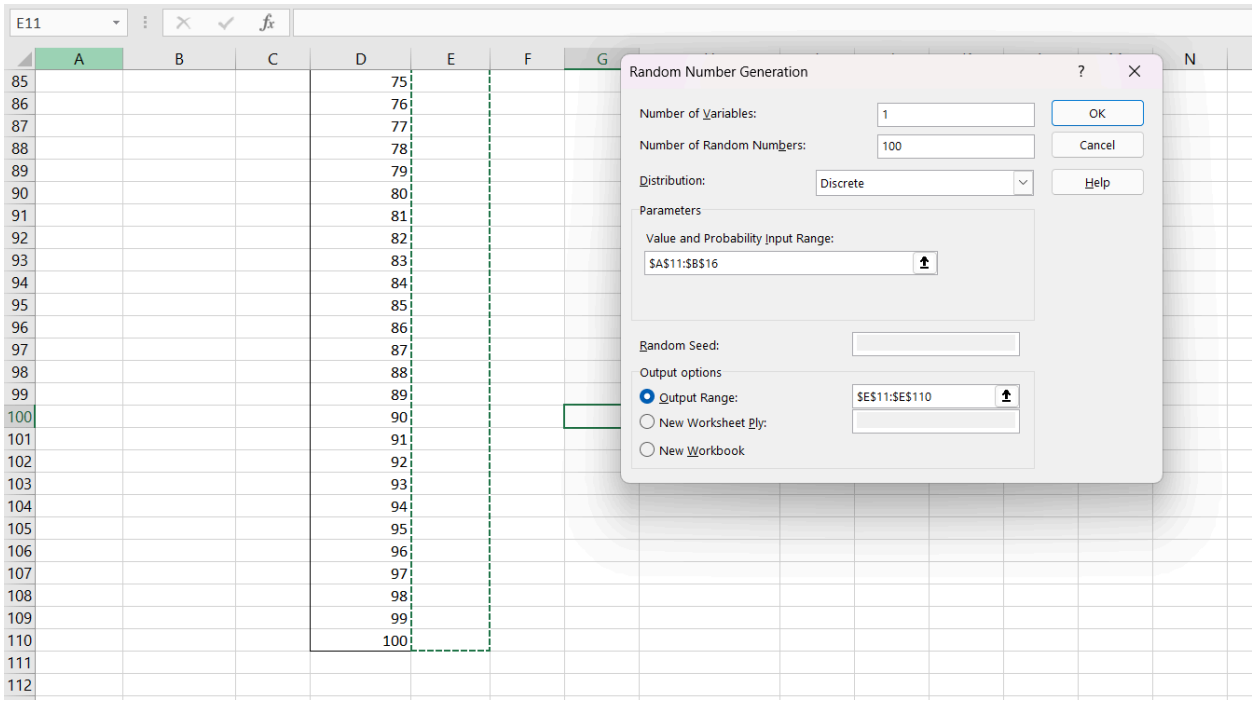
Occurrence –

For occurrence, we will use the “Data Analytics” tool pack in excel.

Selecting Data Analysis option –


G100
Arya Nair 16010421063 A2 MS IA-1
a. To simulate rolling a six-sided die 100 times.
Probability Distribution Table
Numbers on a die
Probability of occurent of each
1 0.1666666667
2 0.1666666667
3 0.1666666667
4 0.1666666667
5 0.1666666667
6 0.1666666667
Simulaton Table
Number of throws
Ocurrence
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Digit
Data Analysis
Analysis Tools
Covariance
Descriptive Statistics
Exponential Smoothing
F-Test Two-Sample for Variances
Fourier Analysis
Histogram
Moving Average
Random Number Generation
Rank and Percentile
Regression
OK
Cancel
Help


A11
Arya Nair 16010421063 A2 MS IA-1
a. To simulate rolling a six-sided die 100 times.
Probability Distribution Table
Numbers on a die
Probability of occurent of each
1 0.1666666667
2 0.1666666667
3 0.1666666667
4 0.1666666667
5 0.1666666667
6 0.1666666667
Simulaton Table
Number of throws
Ocurrence
Digit
Random Number Generation
Number of Variables: 1
Number of Random Numbers: 100
Distribution: Discrete
Parameters
Value and Probability Input Range: $A$11:$B$16
Random Seed:
Output options
Output Range:
New Worksheet Ply:
New Workbook
OK
Cancel
Help
Sheet1



G20

Arya Nair 16010421063 A2 MS IA-1

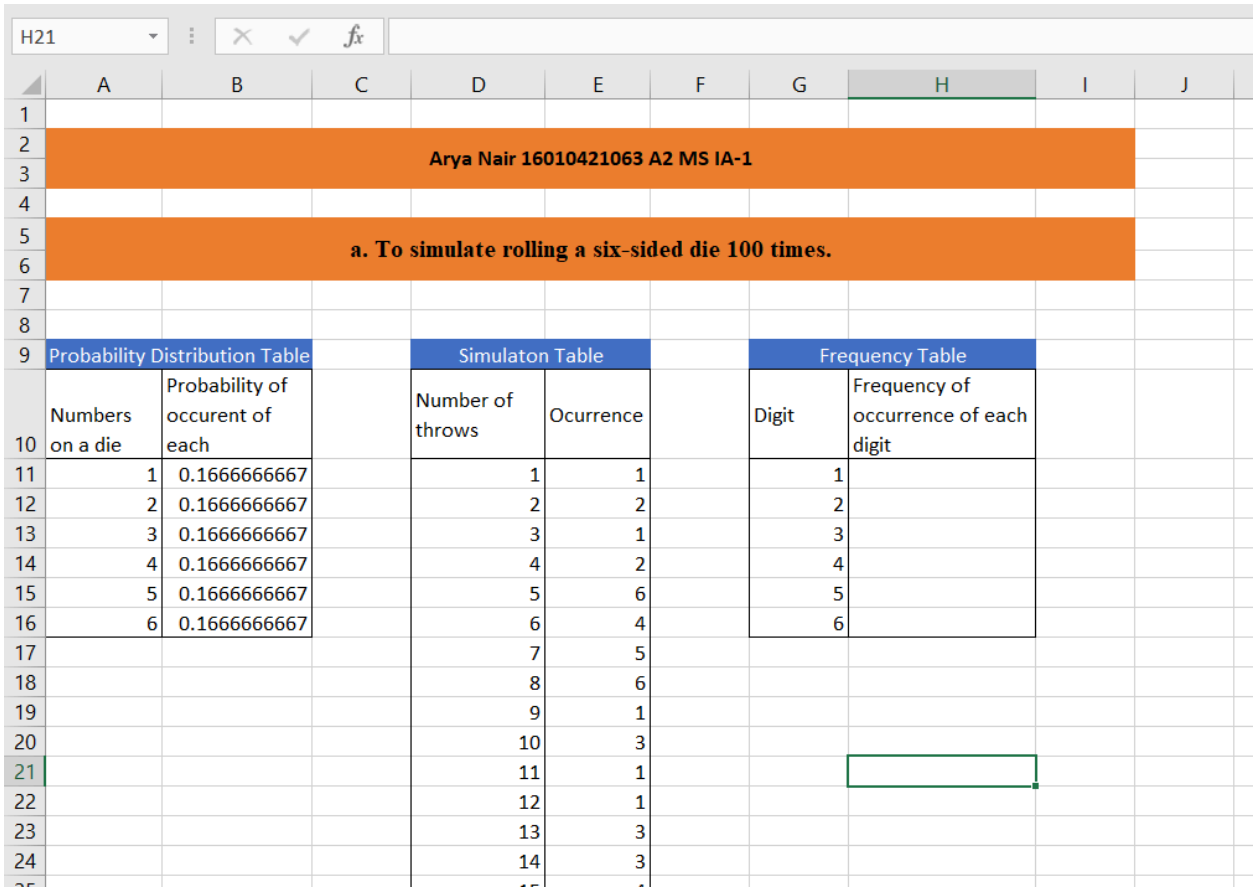
a. To simulate rolling a six-sided die 100 times.

Probability Distribution Table	
Numbers on a die	Probability of occurent of each
1	0.1666666667
2	0.1666666667
3	0.1666666667
4	0.1666666667
5	0.1666666667
6	0.1666666667

Simulaton Table	
Number of throws	Ocurrence
1	1
2	2
3	1
4	2
5	6
6	4
7	5
8	6
9	1
10	3
11	1
12	1
13	3
14	3
15	4

Frequency Table	
Digit	Frequency of occurrence of each digit

Frequency & digit – We are doing this to tally our answer which we will get from histogram. This step can be excluded.



H21

Arya Nair 16010421063 A2 MS IA-1

a. To simulate rolling a six-sided die 100 times.

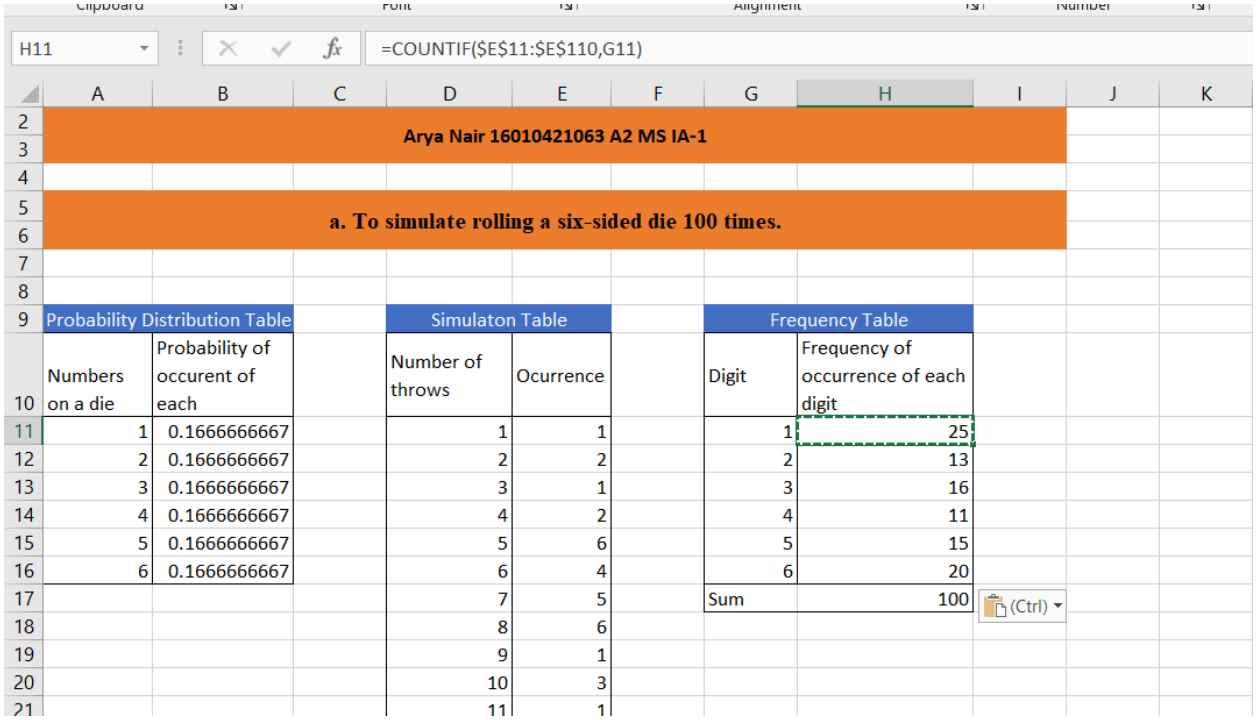
Probability Distribution Table	
Numbers on a die	Probability of occurent of each
1	0.1666666667
2	0.1666666667
3	0.1666666667
4	0.1666666667
5	0.1666666667
6	0.1666666667

Simulaton Table	
Number of throws	Ocurrence
1	1
2	2
3	1
4	2
5	6
6	4
7	5
8	6
9	1
10	3
11	1
12	1
13	3
14	3

Frequency Table	
Digit	Frequency of occurrence of each digit
1	
2	
3	
4	
5	
6	

Frequency of occurrence of each digit –

We will use “COUNTIF” function of excel to calculate frequency of each digit.



H11 | =COUNTIF($E$11:$E$110,G11)

Arya Nair 16010421063 A2 MS IA-1

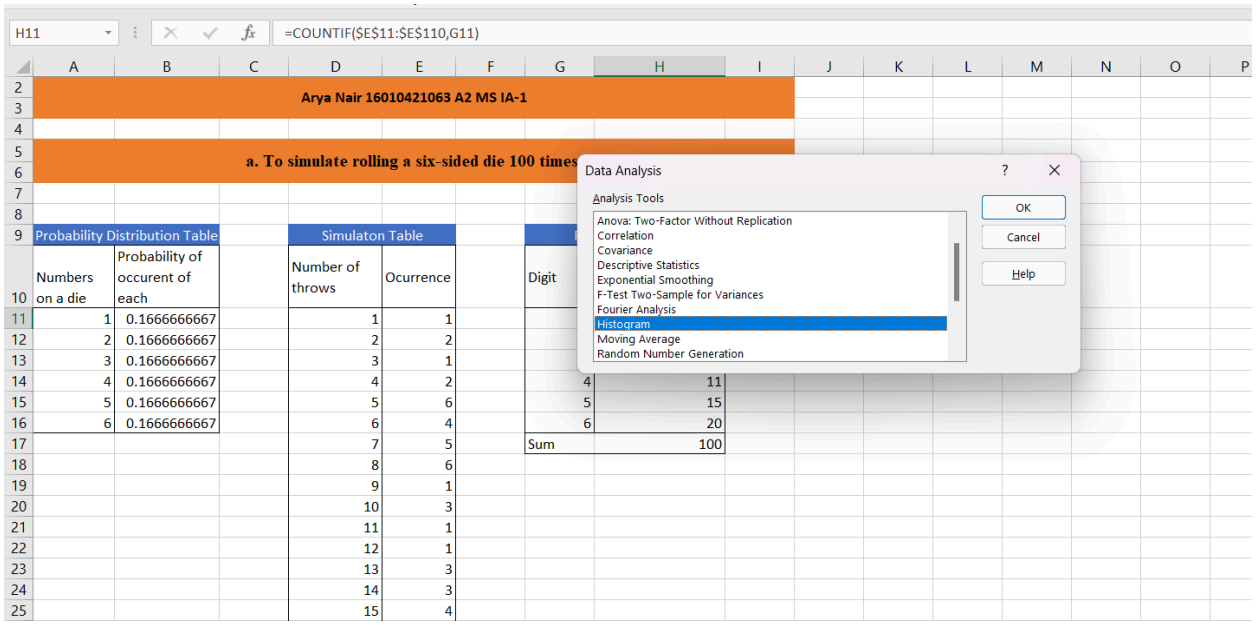
a. To simulate rolling a six-sided die 100 times.

Probability Distribution Table		Simulaton Table		Frequency Table	
Numbers on a die	Probability of occurent of each	Number of throws	Ocurrence	Digit	Frequency of occurrence of each digit
1	0.1666666667	1	1	1	25
2	0.1666666667	2	2	2	13
3	0.1666666667	3	1	3	16
4	0.1666666667	4	2	4	11
5	0.1666666667	5	6	5	15
6	0.1666666667	6	4	6	20
		7	5	Sum	100
		8	6		
		9	1		
		10	3		
		11	1		

(Ctrl)

3) Creating a Histogram

For this again we will use “Data Analysis” tool pack in excel.



H11 | =COUNTIF($E$11:$E$110,G11)

Arya Nair 16010421063 A2 MS IA-1

a. To simulate rolling a six-sided die 100 times

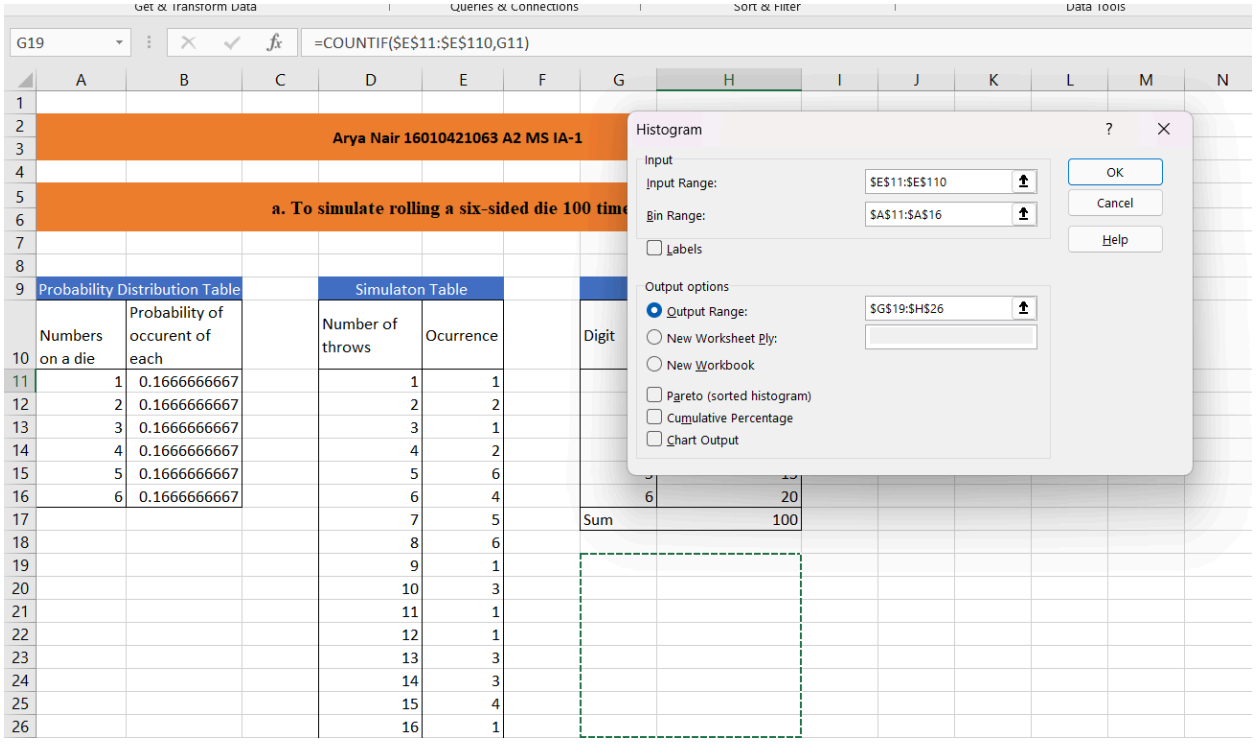
Data Analysis

Analysis Tools

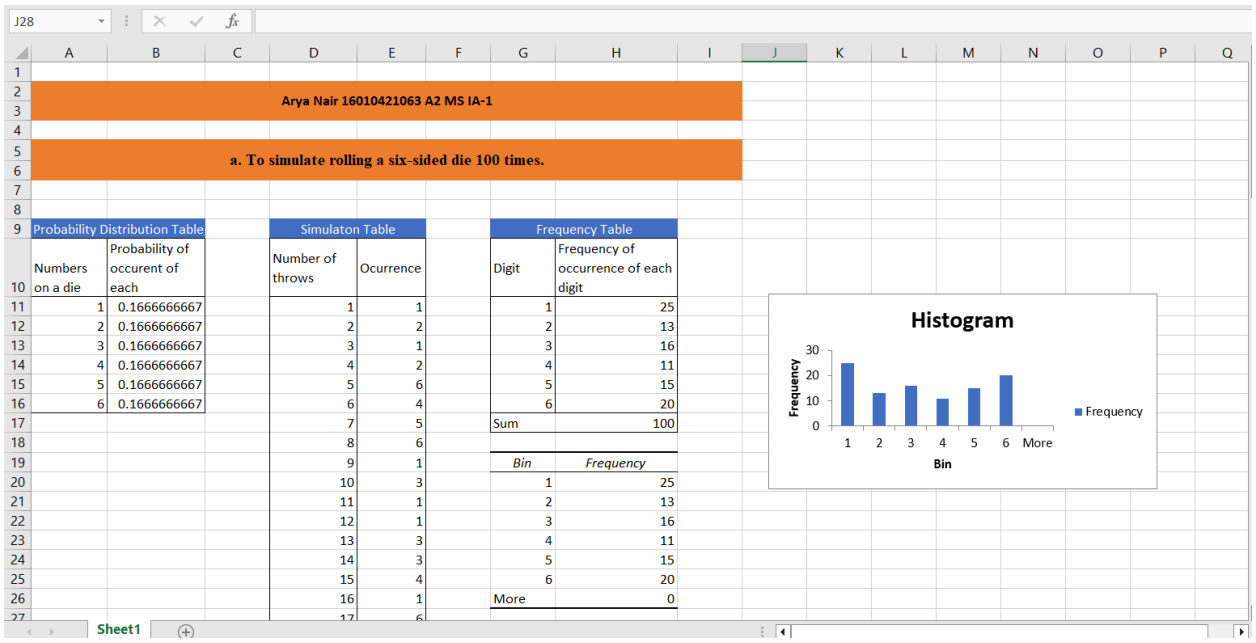
- Anova: Two-Factor Without Replication
- Correlation
- Covariance
- Descriptive Statistics
- Exponential Smoothing
- F-Test Two-Sample for Variances
- Fourier Analysis
- Histogram
- Moving Average
- Random Number Generation

OK | Cancel | Help

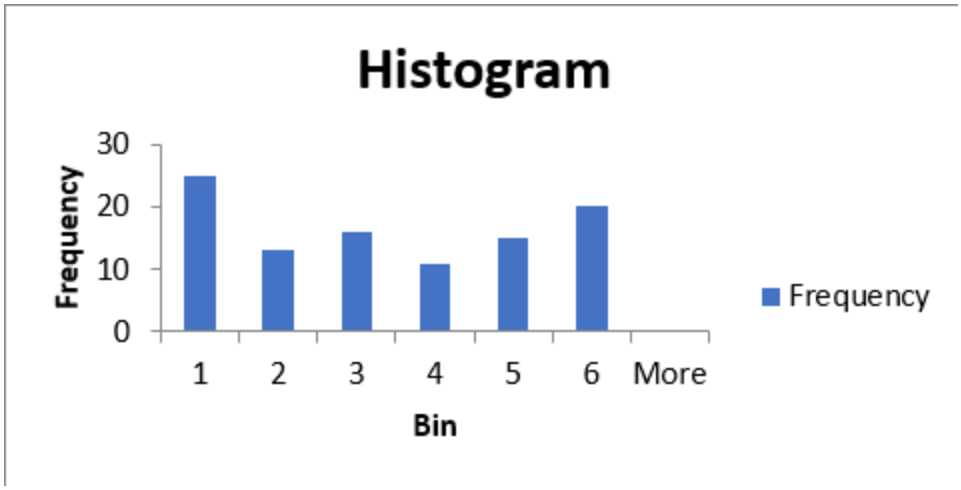
Probability Distribution Table		Simulaton Table		Frequency Table	
Numbers on a die	Probability of occurent of each	Number of throws	Ocurrence	Digit	Frequency of occurrence of each digit
1	0.1666666667	1	1	1	25
2	0.1666666667	2	2	2	13
3	0.1666666667	3	1	3	16
4	0.1666666667	4	2	4	11
5	0.1666666667	5	6	5	15
6	0.1666666667	6	4	6	20
		7	5	Sum	100
		8	6		
		9	1		
		10	3		
		11	1		
		12	1		
		13	3		
		14	3		
		15	4		



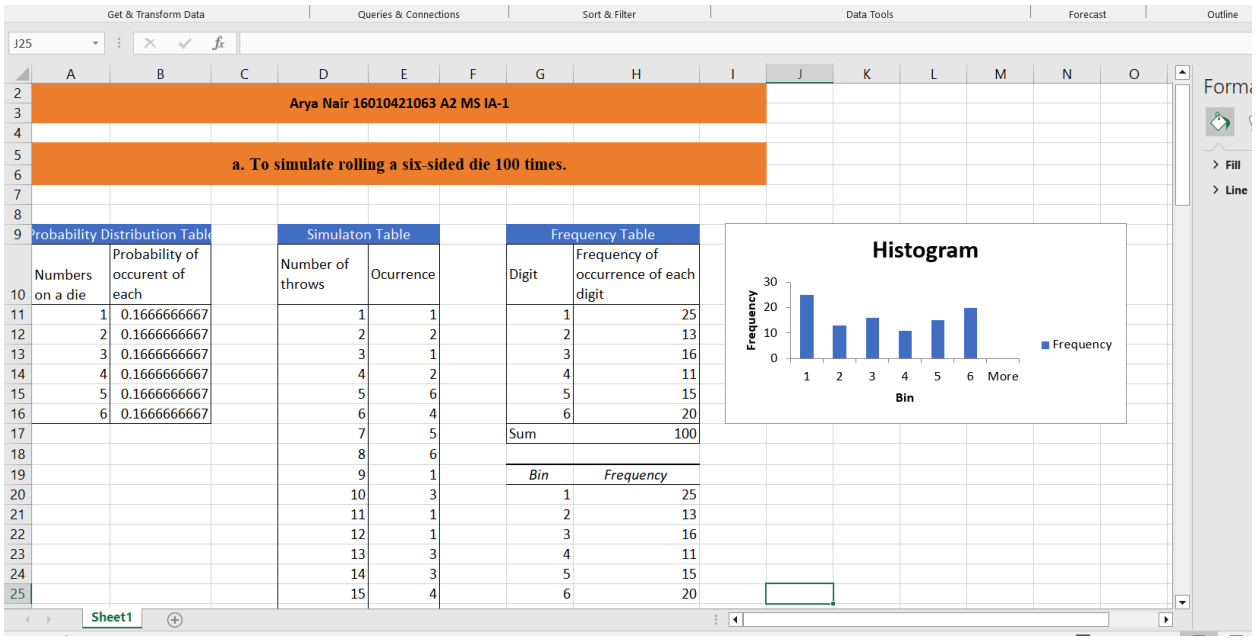
After clicking on ok



This is the final histogram

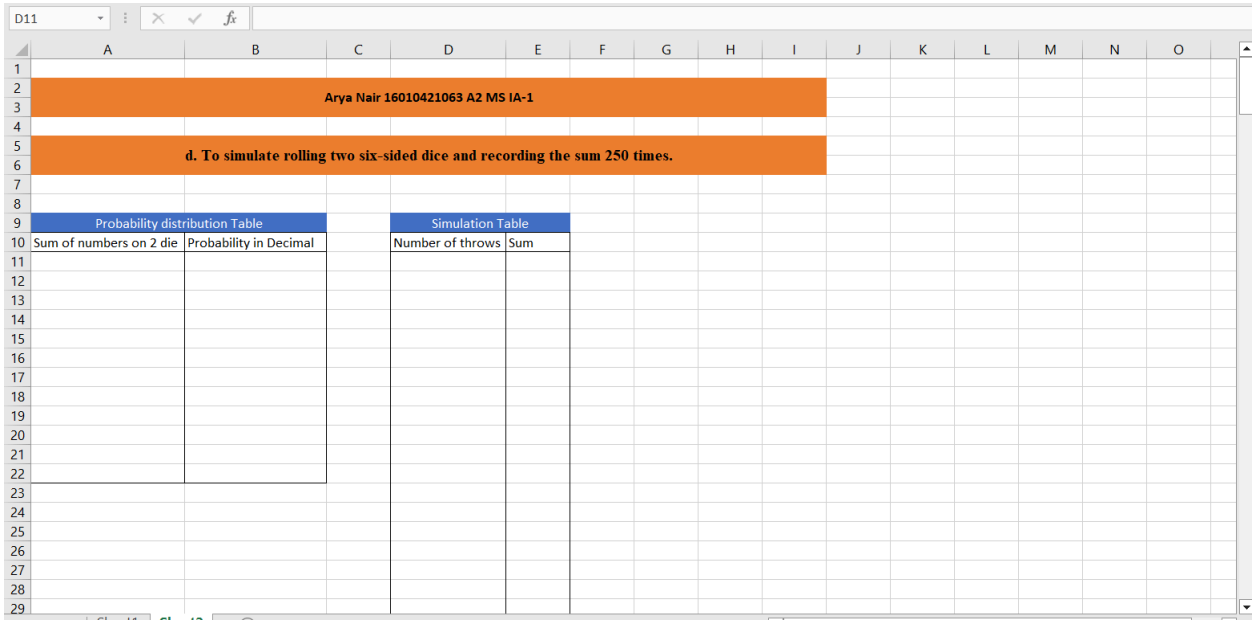


4) Final

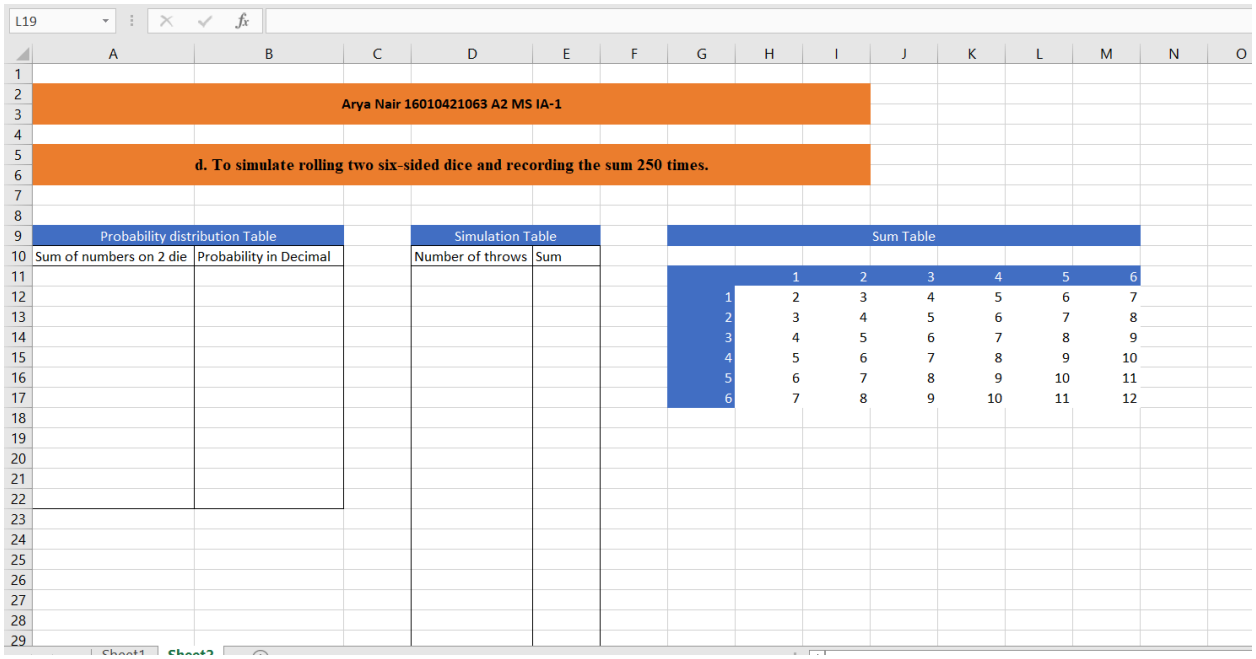


d. To simulate rolling two six-sided dice and recording the sum 250 times.

1) **Creating required tables and naming the columns**

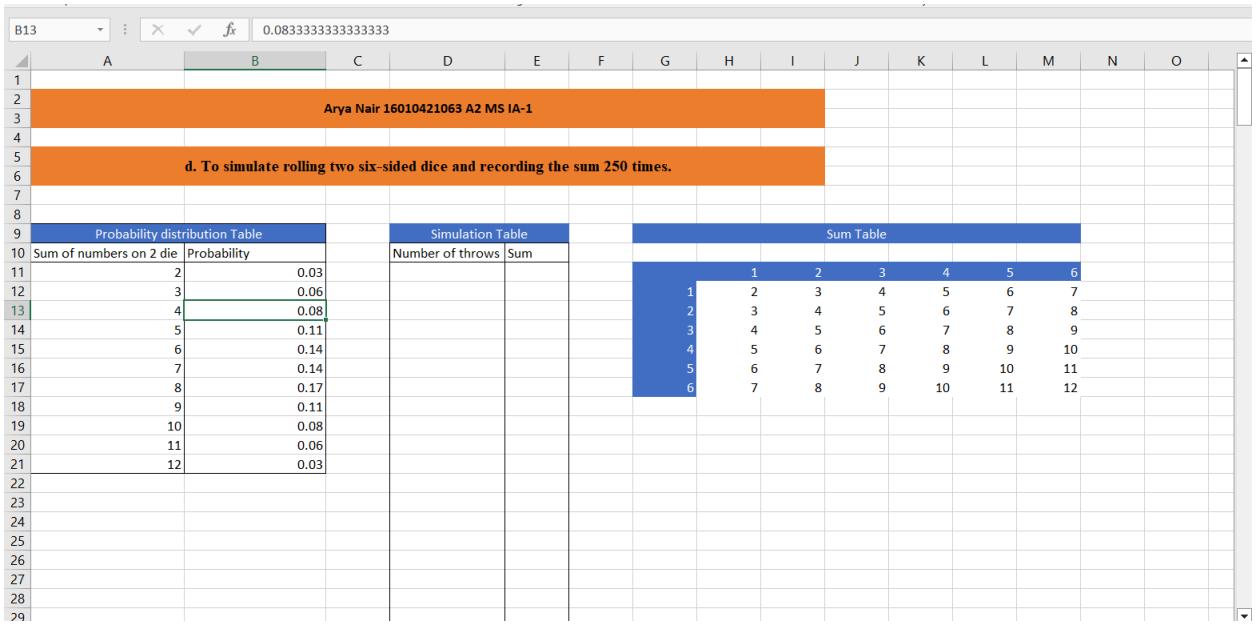


2) To find the probability of occurrence of sum of each digit, we need to make a sum table as follows –



The dark blue numbers depict the digits on 2 dies and light blue digits depicts the sum.

3) Based on the sum table, we can calculate the probability of occurrence of sum of each digit for numbers from 2-12 –



B13 | 0.0833333333333333

Arya Nair 16010421063 A2 MS IA-1

d. To simulate rolling two six-sided dice and recording the sum 250 times.

Probability distribution Table	
Sum of numbers on 2 die	Probability
2	0.03
3	0.06
4	0.08
5	0.11
6	0.14
7	0.14
8	0.17
9	0.11
10	0.08
11	0.06
12	0.03

Simulation Table	
Number of throws	Sum

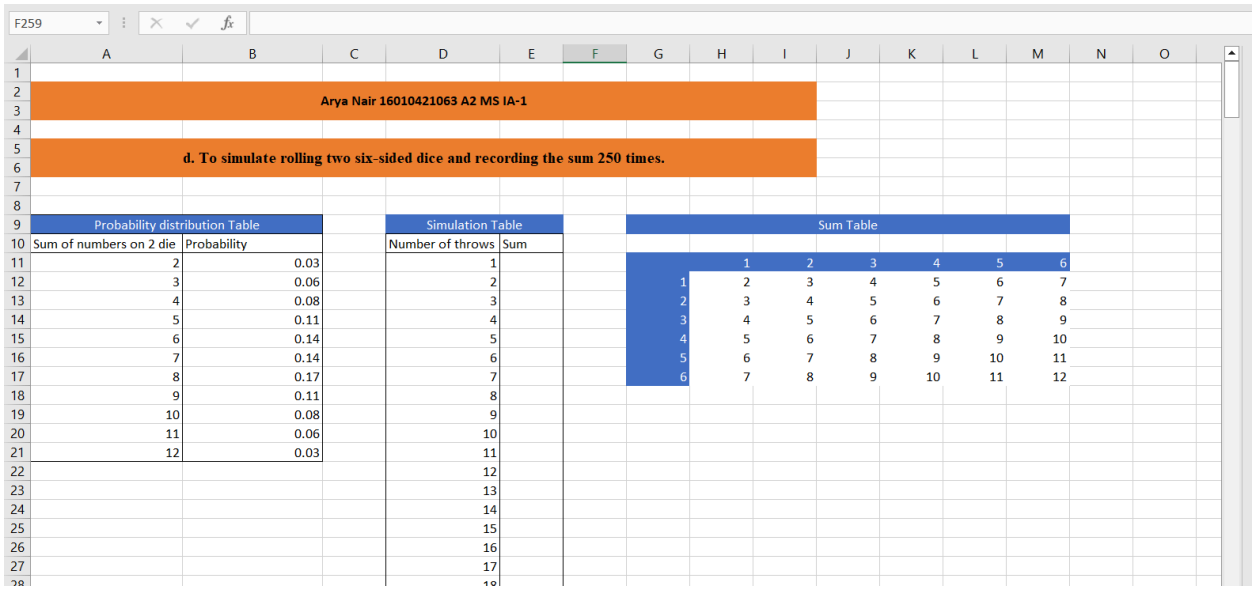
Sum Table

	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

As seen from the sum table, there are total 36 possibilities. We count the number of times each digit has appeared and then divide it by 36 to get the probability.

4) Applying Formulae to generate-

Number of throws –



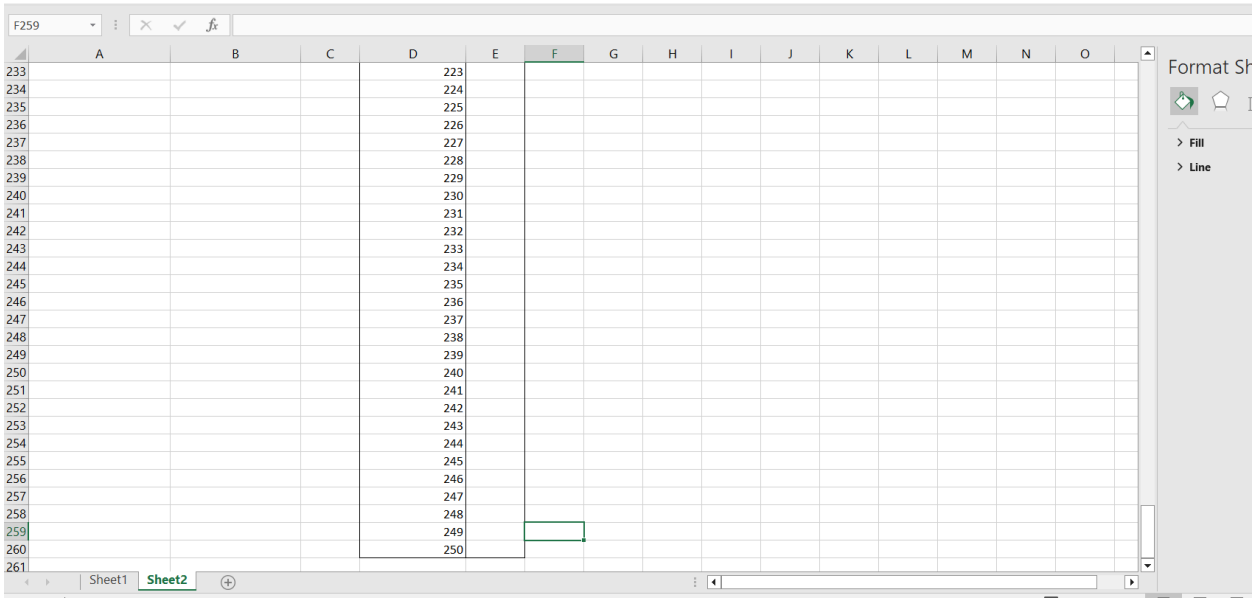
Arya Nair 16010421063 A2 MS IA-1

d. To simulate rolling two six-sided dice and recording the sum 250 times.

Probability distribution Table	
Sum of numbers on 2 die	Probability
2	0.03
3	0.06
4	0.08
5	0.11
6	0.14
7	0.14
8	0.17
9	0.11
10	0.08
11	0.06
12	0.03

Simulation Table	
Number of throws	Sum
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Sum Table						
	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12



223
224
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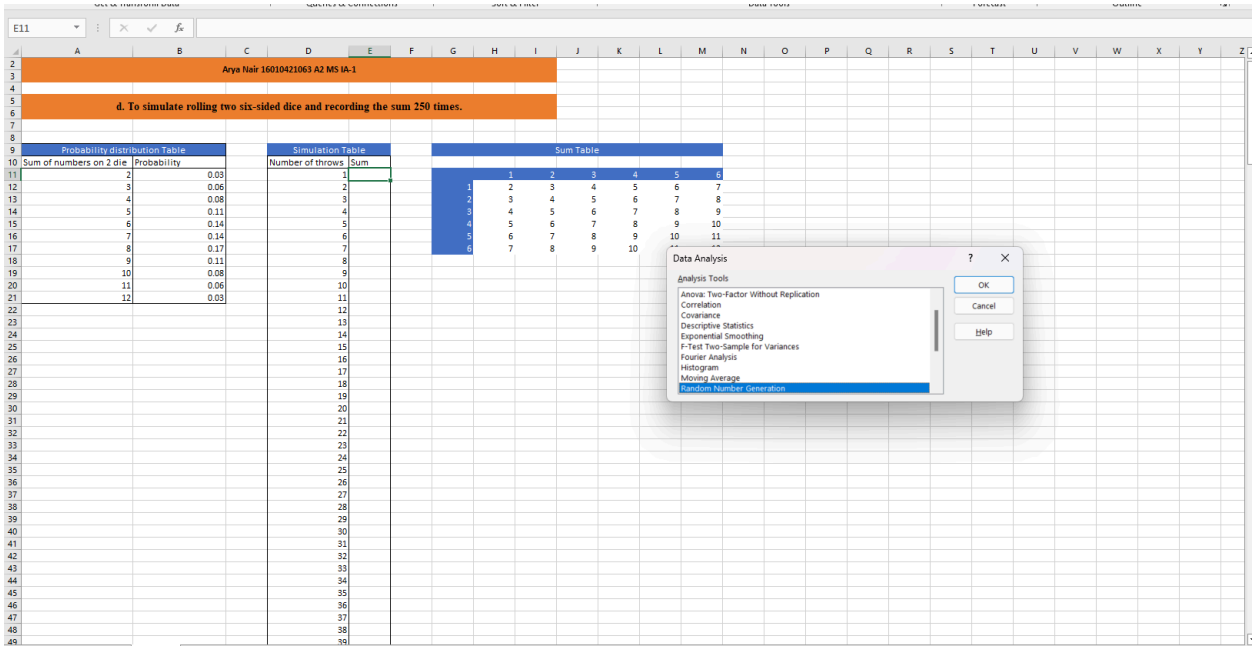
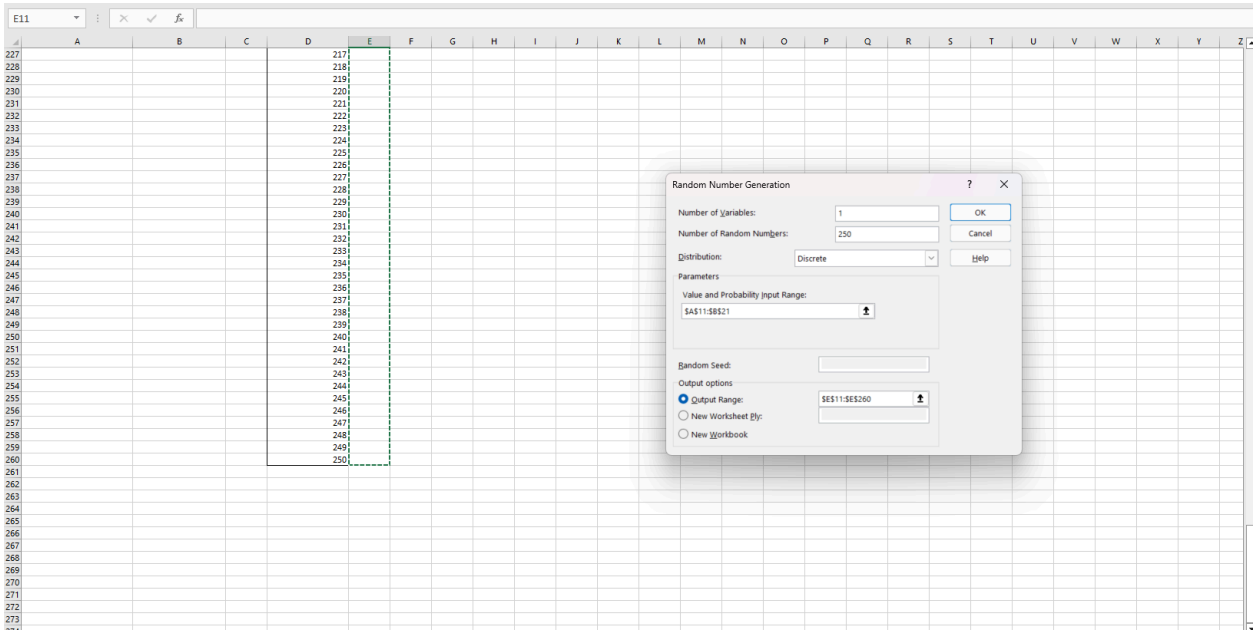
249
250

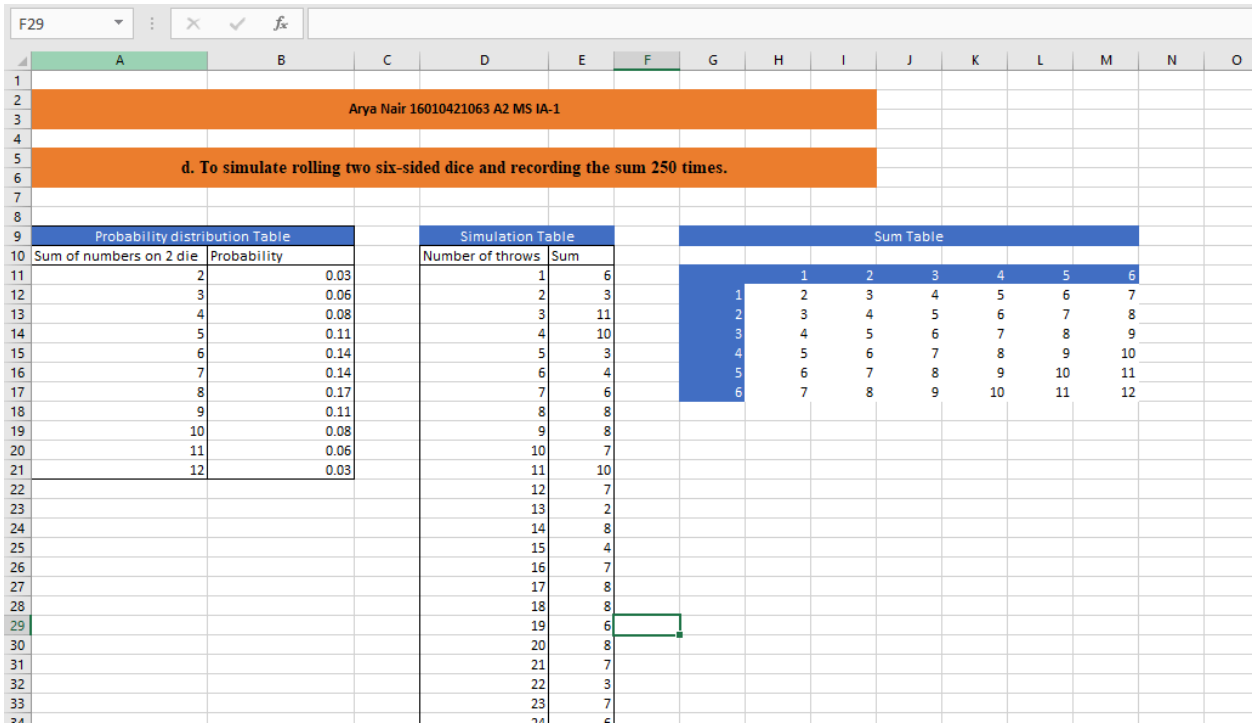
Sum –

To simulate the sum, we will use the “Data Analytics” tool kit of excel.


Arya Nair 16010421063 A2 MS IA-1
d. To simulate rolling two six-sided dice and recording the sum 250 times.
Probability distribution Table
Sum of numbers on 2 die
Probability
2 0.03
3 0.06
4 0.08
5 0.11
6 0.14
7 0.14
8 0.17
9 0.11
10 0.08
11 0.06
12 0.03
Simulation Table
Number of throws
Sum
Sum Table
Data Analysis
Analysis Tools
Anova: Two-Factor Without Replication
Correlation
Covariance
Descriptive Statistics
Exponential Smoothing
F-Test Two-Sample for Variances
Fourier Analysis
Histogram
Moving Average
Random Number Generation
OK
Cancel
Help


Random Number Generation
Number of Variables: 1
Number of Random Numbers: 250
Distribution: Discrete
Parameters
Value and Probability Input Range: $A$11:$B$21
Random Seed:
Output options
Output Range: $E$11:$E$260
New Worksheet Ply:
New Workbook
OK
Cancel
Help

After clicking on “OK” , random numbers for sum get generated–



Arya Nair 16010421063 A2 MS IA-1

d. To simulate rolling two six-sided dice and recording the sum 250 times.

Probability distribution Table

Sum of numbers on 2 die	Probability
2	0.03
3	0.06
4	0.08
5	0.11
6	0.14
7	0.14
8	0.17
9	0.11
10	0.08
11	0.06
12	0.03

Simulation Table

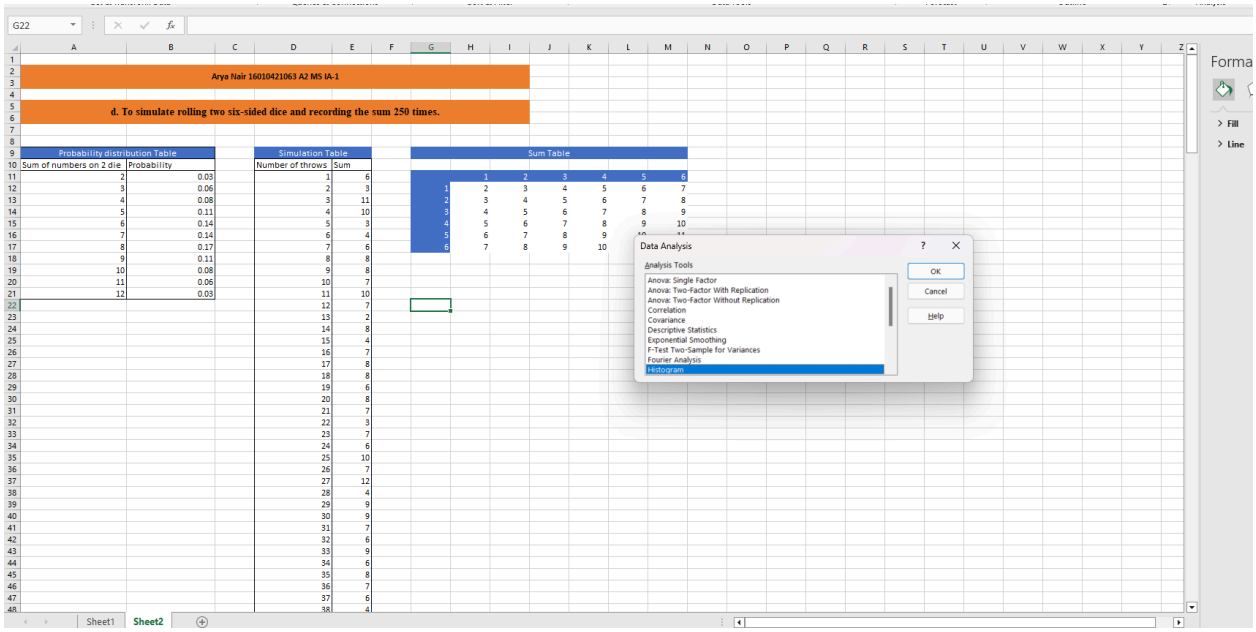
Number of throws	Sum
1	6
2	3
3	11
4	10
5	3
6	4
7	6
8	8
9	8
10	7
11	10
12	7
13	2
14	8
15	4
16	7
17	8
18	8
19	6
20	8
21	7
22	3
23	7

Sum Table

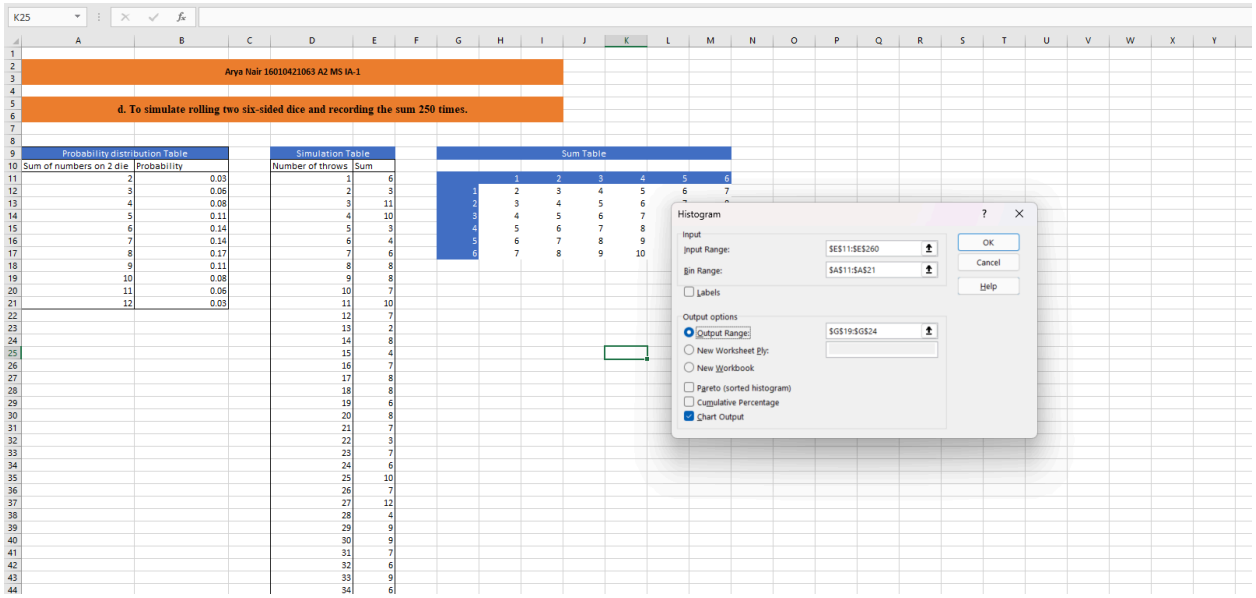
	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

5) Creating a histogram

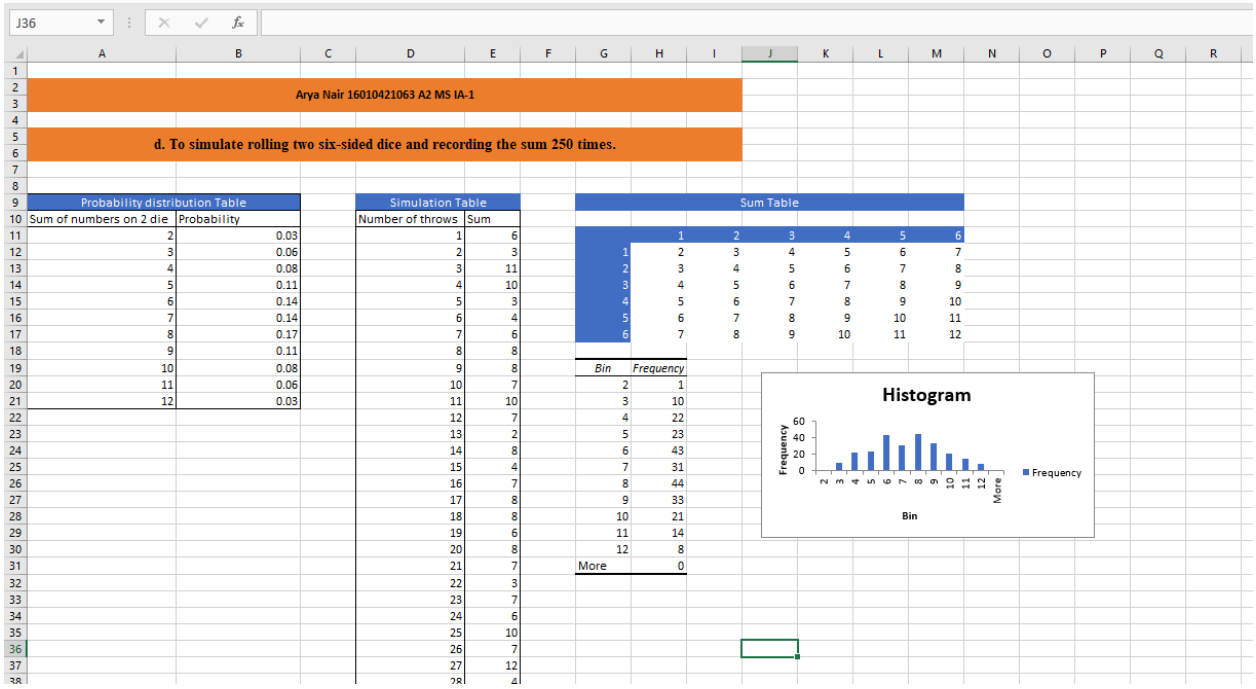
For creating histogram, we will again use “Data Analysis” tool pack in excel.



Selecting output range –



After clicking on OK-



Arya Nair 16010421063 A2 MS IA-1

d. To simulate rolling two six-sided dice and recording the sum 250 times.

Probability distribution Table

Sum of numbers on 2 die	Probability
2	0.03
3	0.06
4	0.08
5	0.11
6	0.14
7	0.14
8	0.17
9	0.11
10	0.08
11	0.06
12	0.03

Simulation Table

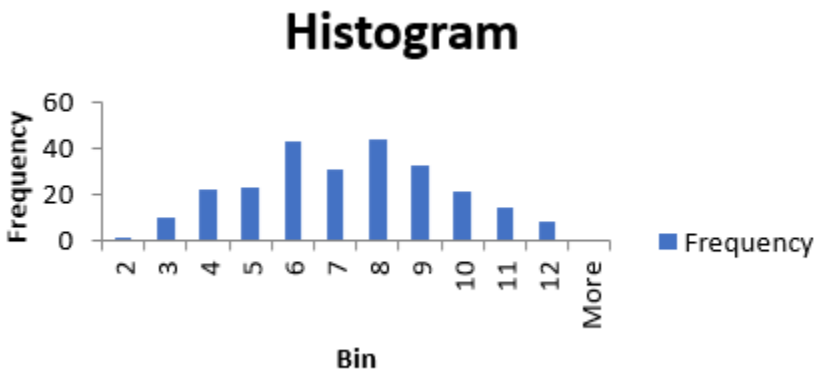
Number of throws	Sum
1	6
2	3
3	11
4	10
5	3
6	4
7	6
8	8
9	8
10	7
11	10
12	7
13	2
14	8
15	4
16	7
17	8
18	8
19	6
20	8
21	7
22	3
23	7
24	6
25	10
26	7
27	12

Sum Table

	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

Bin	*Frequency*
2	1
3	10
4	22
5	23
6	43
7	31
8	44
9	33
10	21
11	14
12	8
More	0

Final Histogram



6) Final

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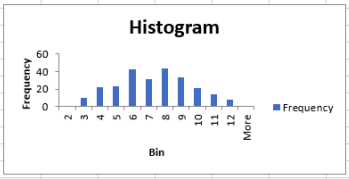
Arya Nair 16010421063 A2 MS IA-1

d. To simulate rolling two six-sided dice and recording the sum 250 times.

Probability distribution Table	
Sum of numbers on 2 die	Probability
2	0.03
3	0.06
4	0.08
5	0.11
6	0.14
7	0.14
8	0.17
9	0.11
10	0.08
11	0.06
12	0.03

Simulation Table	
Number of throws	Sum
1	6
2	3
3	11
4	10
5	3
6	4
7	6
8	8
9	8
10	7
11	10
12	7
13	2
14	8
15	4
16	7
17	8
18	8
19	6
20	8
21	7
22	3
23	7
24	6
25	10
26	7
27	12

Sum Table

	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

Bin	*Frequency*
2	1
3	10
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5	23
6	43
7	31
8	44
9	33
10	21
11	14
12	8
More	0