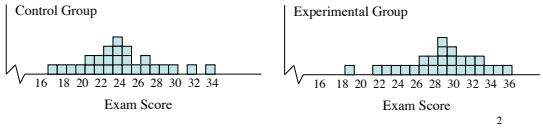
Chapter 2: Frequency Distributions

Control Group		Experimental Group	
25	32	28	29
27	20	25	31
28	23	31	19
17	21	29	35
24	34	30	28
22	29	24	30
24	25	33	27
21	18	34	26
19	22	29	29
30	24	27	32
26	27	30	36
24	23	22	23
23	25	32	33



2

Example 2.1

8, 9, 8, 7, 10, 9, 6, 4, 9, 8, 7, 8, 10, 9, 8, 6, 9, 7, 8, 8,

x	f
10	2
9	5
8	7
7	3
6	2
5	0
4	1

3

Example 2.1b

8, 9, 8, 7, 10, 9, 6, 4, 9, 8, 7, 8, 10, 9, 8, 6, 9, 7, 8, 8,

x	f	fx
10	2	20
9	5	45
8	7	56
7	3	21
6	2	12
5	0	0
4	1	4

4

Example 2.2

8, 9, 8, 7, 10, 9, 6, 4, 9, 8, 7, 8, 10, 9, 8, 6, 9, 7, 8, 8,

x	f	p=f/N	%=p(100)
10	2	2/20=0.10	10%
9	5	5/20=0.25	25%
8	7	7/20=0.35	35%
7	3	3/20=0.15	15%
6	2	2/20=0.10	10%
5	0	0/20=0.00	0%
4	1	1/20=0.05	5%

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Grouped Frequency Distribution

- When a frequency distribution table lists all of the individual categories (X values) it is called a **regular frequency distribution**.
- Sometimes the scores covers a wide range of values:
  82, 75, 88, 93, 53, 84, 87, 58, 72, 94, 69, 84,
  61, 91, 64, 87, 84, 70, 76, 89, 75, 80, 73, 73, 60
- A list of all the X values is too long to be a "simple" presentation of the data.
- To remedy this situation, a **grouped frequency distribution** table is used.

Forming Class Intervals of a Grouped Frequency Distribution

1. Approximately 10 class intervals
2. Interval width a relatively simple number (e.g. 2, 5, 10, or 20)
3. Bottom score of each interval a multiple of the width
4. Same width

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Table 2.2 Grouped Frequency Distribution Table

82, 75, 88, 93, 53, 84, 87, 58, 72, 94, 69, 84, 61, 91, 64, 87, 84, 70, 76, 89, 75, 80, 73, 73, 60

x	f
90-94	3
85-89	4
80-84	5
75-79	4
70-74	3
65-69	1
60-64	3
55-59	1
50-54	1

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Frequency Distribution Graphs

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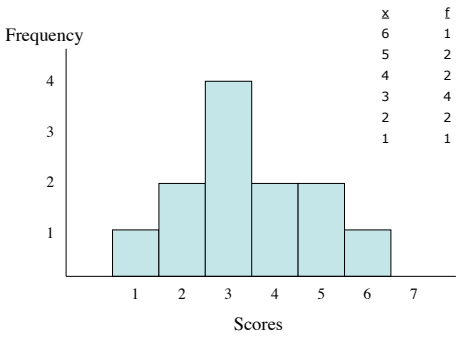
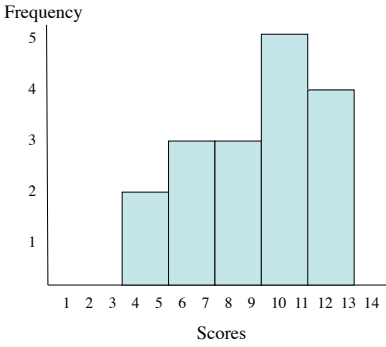


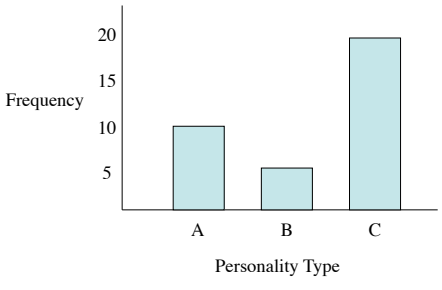
x	f
6	1
5	2
4	2
3	4
2	2
1	1

10



x	f
12-13.	4
10-11.	5
8-9.	3
6-7.	3
4-5.	2

11



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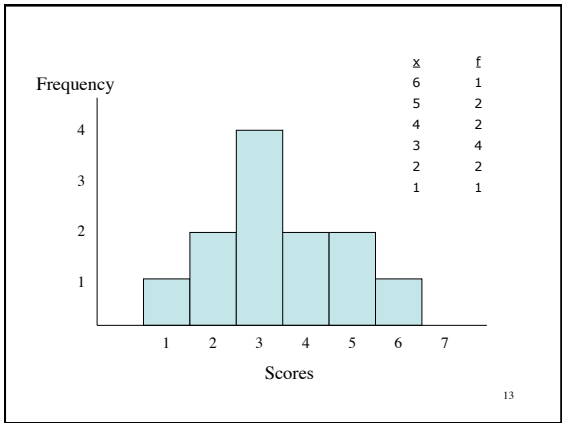
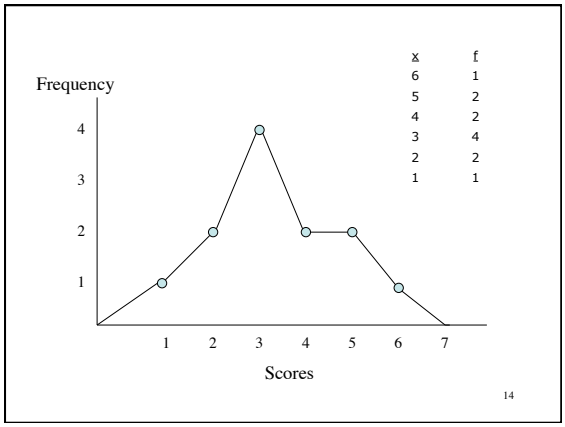
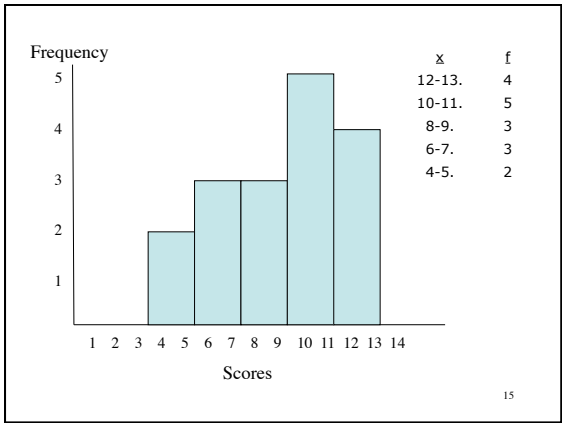
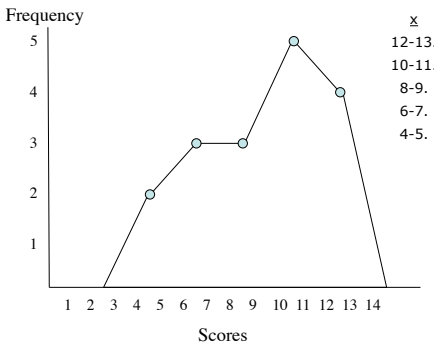

Frequency
4
3
2
1
1 2 3 4 5 6 7
Scores
x f
6 1
5 2
4 2
3 4
2 2
1 1
13

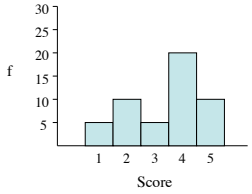

Frequency
4
3
2
1
1 2 3 4 5 6 7
Scores
x f
6 1
5 2
4 2
3 4
2 2
1 1
14


Frequency
5
4
3
2
1
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Scores
x f
12-13. 4
10-11. 5
8-9. 3
6-7. 3
4-5. 2
15

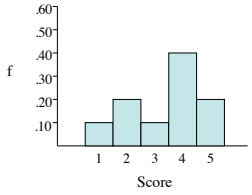


x	f
12-13.	4
10-11.	5
8-9.	3
6-7.	3
4-5.	2

16



x	f
5	10
4	20
3	5
2	10
1	5



x	f	p
5	10	10/50=0.20
4	20	20/50=0.40
3	5	5/50=0.10
2	10	10/50=0.20
1	5	5/50=0.10

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N=50

x	f	p	%
5	10	10/50=0.20	20%
4	20	20/50=0.40	40%
3	5	5/50=0.10	10%
2	10	10/50=0.20	20%
1	5	5/50=0.10	10%

N=400

x	f	p	%
5	80	80/400=0.20	20%
4	160	160/400=0.40	40%
3	40	40/400=0.10	10%
2	80	80/400=0.20	20%
1	40	40/400=0.10	10%

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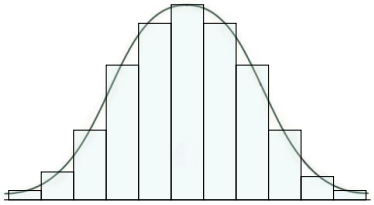

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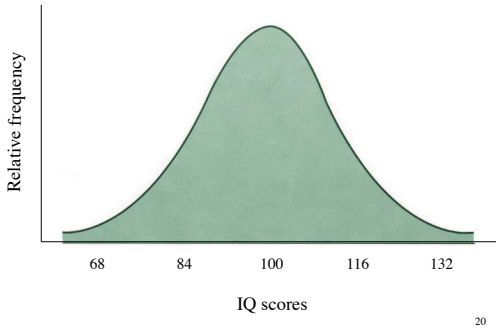

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Any distribution can be described by 3 characteristics:

1. Shape
2. Central tendency
3. Variability

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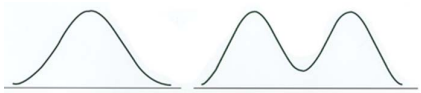
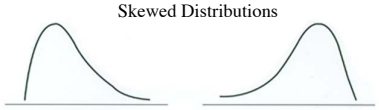
Symmetrical Distributions



Skewed Distributions



Positive skew

Negative skew

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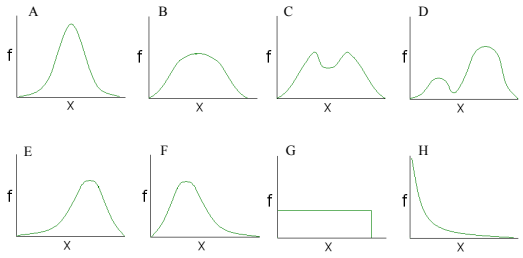
Frequency Distributions



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Percentile Ranks and Percentiles :

- The percentage of scores in the distribution at or below a particular score is known as a ***percentile rank***.
- The score corresponding to a specific percentile rank is known as a **percentile score**.

24

1.3, 5.2, 4.0, 4.2, 3.0, 2.1, 4.3, 2.9, 1.0

3.8, 3.9, 3.3, 3.1, 1.9, 3.4, 2.2, 2.9, 1.8

3.0, 2.7

5
4
3
2
1

25

x	f	cf	c%
5	1	20	100%
4	5	19	95%
3	8	14	70%
2	4	6	30%
1	2	2	10%

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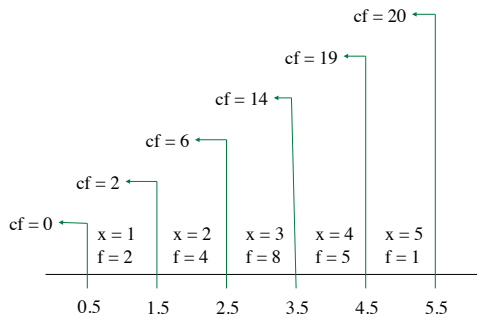

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	x	f	cf	c%	
5.5	5	1	20	100%	100%
4.5	4	5	19	95%	95%
3.5	3	8	14	70%	70%
2.5	2	4	6	30%	30%
1.5	1	2	2	10%	10%
.5					0%

10%

28

6, 3, 7, 2, 8, 11, 6, 7, 16, 12,

9, 14, 8, 15, 9, 18, 7, 8, 21, 23

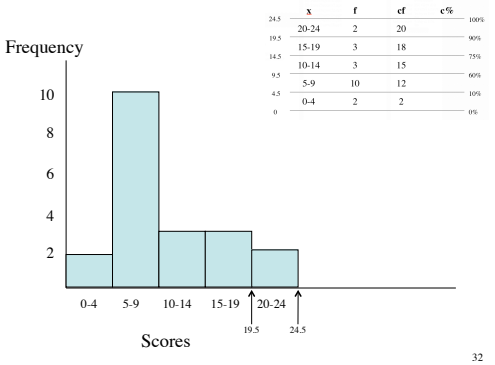
29

x	f	cf	c%
20-24	2	20	100%
15-19	3	18	90%
10-14	3	15	75%
5-9	10	12	60%
0-4	2	2	10%

30

	x	f	cf	c%	
24.5					100%
	20-24	2	20		
19.5					90%
	15-19	3	18		
14.5					75%
	10-14	3	15		
9.5					60%
	5-9	10	12		
4.5					10%
	0-4	2	2		
0					0%

31



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