

Math 140

Introductory Statistics

Lecture notes and homework

www.csun.edu/~dorsogna

and then click under Math 140

Data from Tables

Variables - columns

Characteristics of each case
Allows us to see the **variability**

Cases - rows
Subjects and
objects
of statistical
investigation

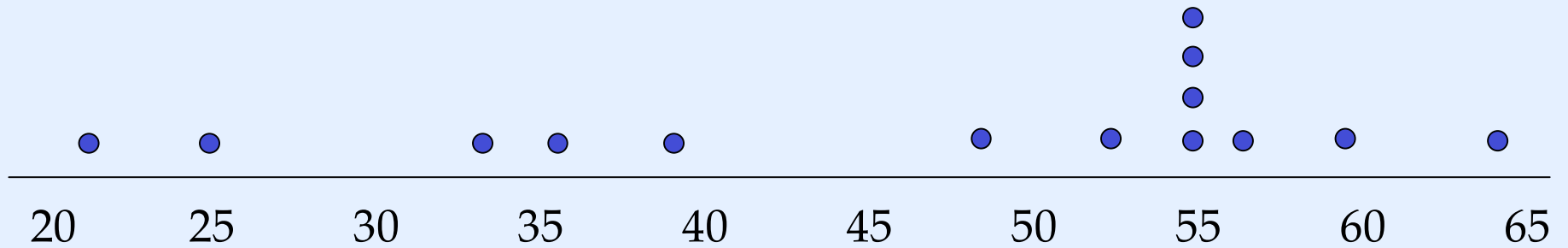
Row	Job Title	Pay	Seniority	Round	Age
2	EngClerk	H	1.5	6	25
3	EngTech	H	12.4	6	38
4	Chemist	S	36.8	1	69
...					
...					

Cases = individual Westvaco employees
Variables = Job title, pay, layoff round

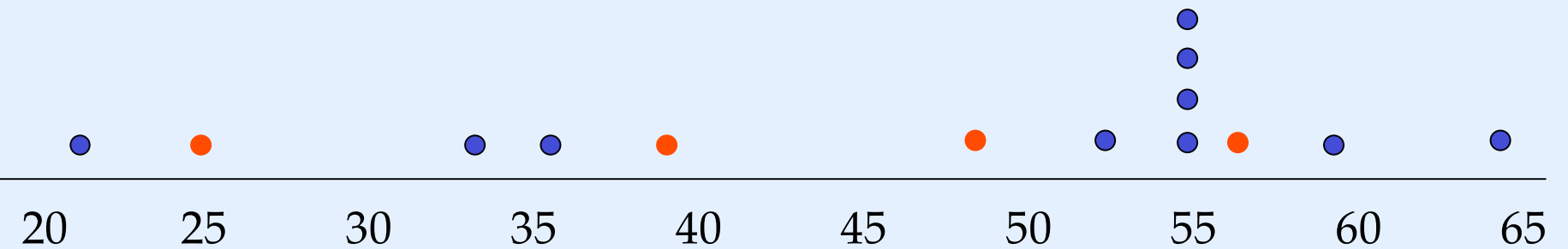
Data for hourly workers

Row	Job Title	Age
1	Eng Clerk	25
2	Eng Tech II	38
3	Eng Tech II	56
4	Secretary	48
5	Eng Tech II	53
6	Eng Tech II	55
7	Eng Tech II	59
8	Parts Crib Attendant	22
9	Eng Tech II	55
10	Eng Tech II	64
11	Technical Secretary	55
12	Eng Tech II	55
13	Eng Tech II	33
14	Eng Tech II	35

Comparing dot plots



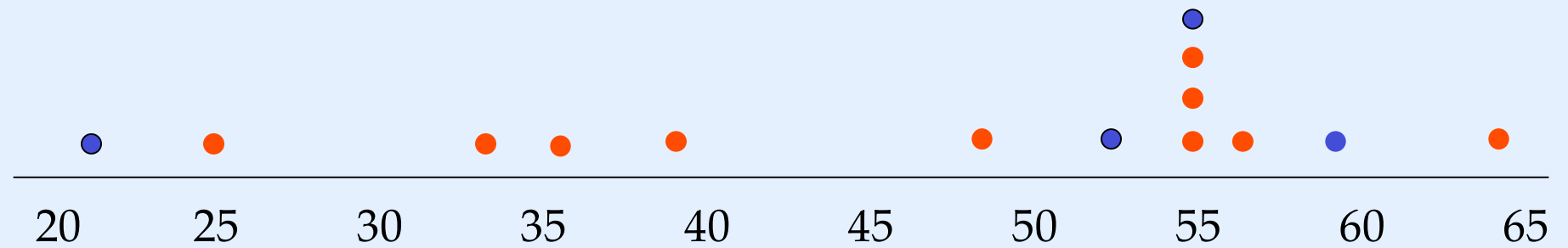
1.2) Age



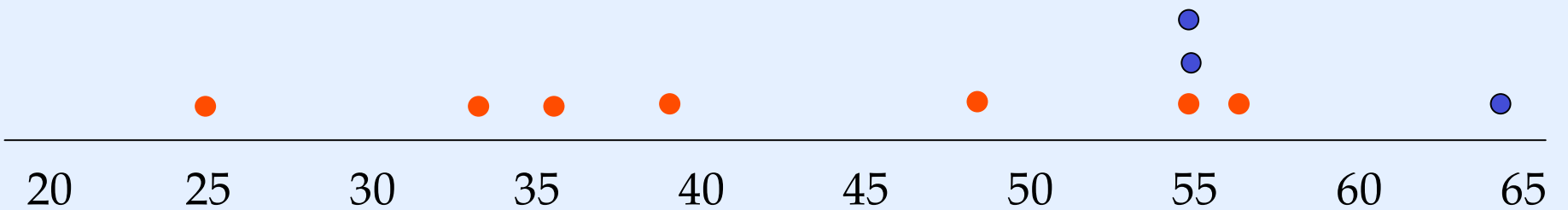
1.3) At the end of round 6 - laid off (blue), retained (red)

Let's use other information

Round by Round



Laid off at round 1 (blue)



Laid off at round 2 (blue)

Keep on going

Salaried workers

Summary Tables

Laid off?

Under
50?

	Yes	No	Total	% Yes
Yes				
No				
Total				

Summary Tables

Laid off?

Under
50?

	Yes	No	Total	% Yes
Yes	6	10		
No	12	8		
Total				

Summary Tables

Laid off?

Under
50?

	Yes	No	Total	% Yes
Yes	6	10	16	
No	12	8	20	
Total	18	18	36	

Summary Tables

Laid off?

Under
40?

	Yes	No	Total	% Yes
Yes	4	5	9	44%
No	14	13	27	52%
Total	18	18	36	50%

1. What proportion of workers of age 50 or older were laid off? Were not laid off?

2. Same question with under 50

3. What proportion of laid off workers were age 50 or older? Were age 50 or lower?

4. Same question with retained workers

5. What proportions should be compared ?

6. Repeat for 1-4 for age 40 as a cutoff.

What table is best to argue with in a court of law?

Overall:

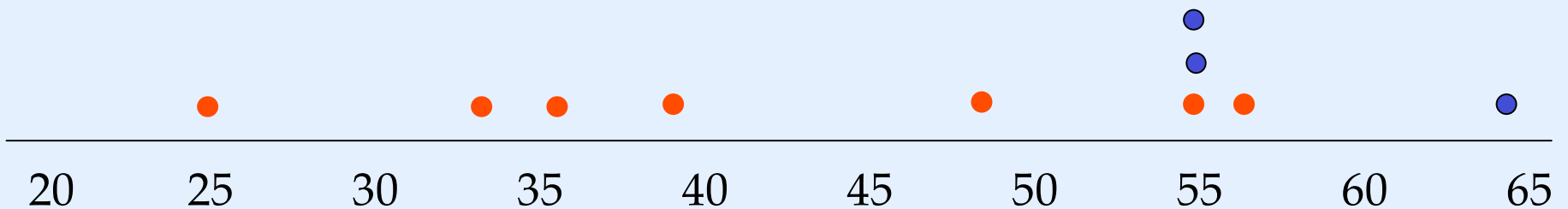
Exploratory work tells us that MAYBE
Older workers were laid off more likely than older ones.

Are the patterns consistent with
no discrimination occurring?

Does the company have some explaining to do at least?

Summary Statistic

Let's use some 'condensed' quantity
from this data

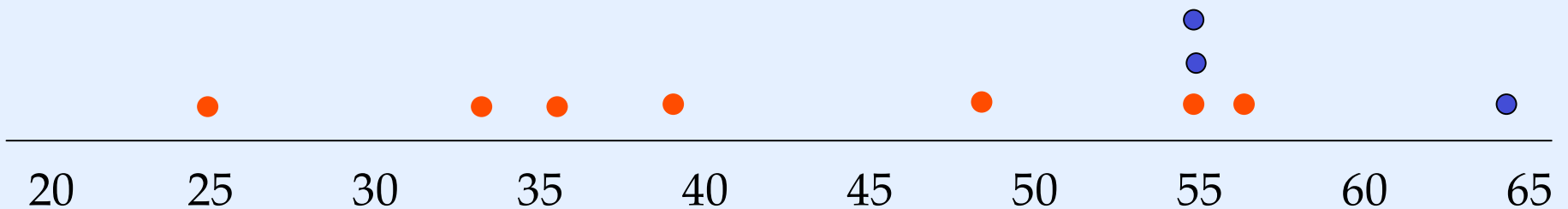


Hourly workers laid off at round 2 (blue)

Summary Statistic

Average age of those who lost job at round 2

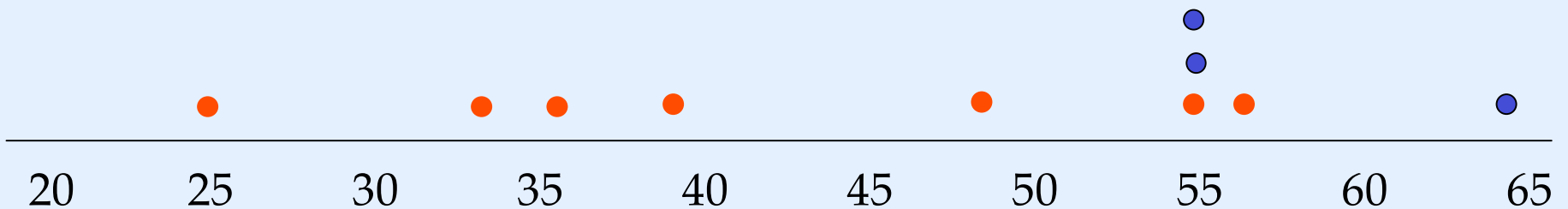
$$\text{Average} = \frac{(55+55+64)}{3} = 58 \text{ years}$$



Hourly workers laid off at round 2 (blue)

Summary Statistic

Average age of all workers at round 2?

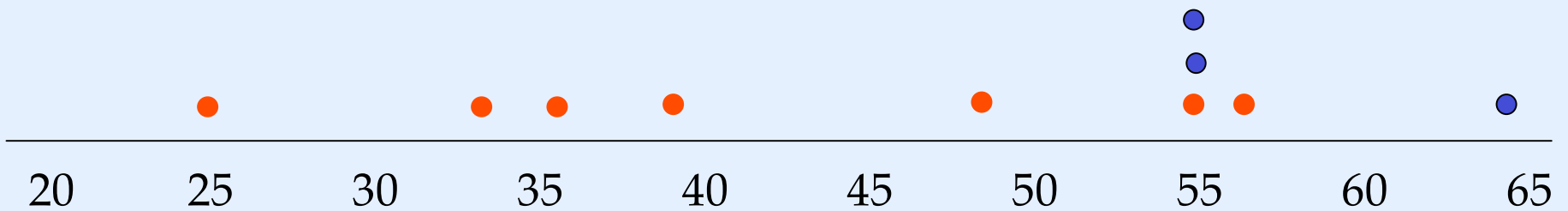


Laid off at round 2 (blue)

Summary Statistic

Average age of all workers at round 2?

46.4



Laid off at round 2 (blue)

Thoughts?

The average age of all workers is 46.4
The average age of laid off workers is 58
The average age of retained workers is 41.4

What does this really mean?

Can it be attributed to chance?
After all we have only 10 people!

What if I had changed the 64 year old
with the 25 year old?

Would there have been discrimination?

Laid off are 55, 55, 25

The average age of all workers is 46.4
The average age of laid off workers is 45
The average age of retained workers is 47

What does this really mean?

Can it be attributed to chance?
After all we have only 10 people!

What if I had changed the 64 year old
with the 25 year old?

Would there have been discrimination?

For your entertainment

Calculate average ages (retained and laid off)

by exchanging the 64 year old person

with the 25 year old person

For your entertainment

Calculate average ages (retained and laid off)

by exchanging the 64 year old person

with the 25 year old person

But there are many other possibilities!

Why did we choose the 25 year old?

If it were by chance, any exchange should be valid!

Hk

- E9 problems b/c
- E15
- E16
- E20
- E23 problems a/c/d
- Read chapter 1