Tutorial 1

2. 14 In a two-week study of the productivity of workers. The

following data were obtained on the total number of

accept able pieces which 100 workers produced:

:

Group these the figures into a distribution having the

classes 20-29. 30-39. 40-49... . . and 80-89. and plot

a histogram using 120. 30)... . . 180. 90). where the left-

hand endpoint is included hut the right梙and endpoint

is not.

2. I Convert the distribution obtained in Exercise 2.14 into

a cumulative less than distribution and plot its ogive.

2 ..U A contract for the maintenance of a national railway抯

high-horsepower locomotives was given to a large pri

慳te company. After one year of experience with the

maintenance program. those in charge of the program

felt that major improvements could he made in the

reliability of? the locomotives. To document the current

Tutorial 1

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following data were obtained on the total number of

accept able pieces which 100 workers produced:

65364984795628436736

43 78 37 40 68 72 55 62 22 82

88 50 60 56 57 46 39 57 73 65

59 48 76 74 70 51 40 75 56 45

35 62 52 63 32 80 64 53 74 34

76 60 48 55 51 54 45 44 35 51

21 35 61 45 33 61 77 60 85 68

45 53 34 67 42 69 52 68 52 47

63 65 55 61 73 50 53 59 41 54

41 74 82 58 26 35 47 50 38 70

Group these t靏ures into a distribution having the

classes 20?9. 30?9. 40?9... . . and 80?9. and plot

a histogram using 120. 30)... . . 180. 90). where the left-

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high-horsepower locomotives was given to a large pri

慳te company. After one year of experience with the

maintenance program. those in charge of the program

felt that major improvements could he made in the

reliability of? the locomotives. To document the current

status, they collected data on the cost of materials for

rebuilding traction motors. Use the data below to

(a) calculate the sample mean ?,

(h) calculate the sample standard deviation s.

Materials costs for rebuilding traction motors (thou

sands of dollars):

1.4 1 1.70 1.03 0.99 1.68 1.09 1.68 1.94

1.53 2.25 1.60 3.07 1.78 0.67 1.76 1.17

1.54 0.99 0.99 1.17 1.54 1.68 1.62 0.67

0.67 1.78 2.12 1.52 1.01

The following are the numbersofminutes that a person

had to wait for a bus to work on 1 5 working days:

10 1 13 9 5 9 2 10 3 8 6 17 2 10 15

(a) Find the mean.

(b) Find the median.

(e) Draw a boxplot.

2. 1i With reference to the preceding exercise, find s2 using

(a) the flrrnuIa that defines s2:

(b) the handheld calculator formula fors2.

Tutorial 1

2.51) Show that

(X1 ?u =0

for any set of observations xi. x2. ... . X,1.

2.2 1f data are coded so that xj = c ? u + a, show that

= c .11 + a and Sr = I C I

2.5t 1f k cis of data consist. respectively. of,z i . n? . . . .

ohservati黱% and have the means . .... i. then

the overall mean of all the data is given by the formula

?

? ?=1

X =

I?

ill

?=1

Please prove it.

2.X A civil engineer monitors water quality by measuring

the amount of suspended solids in a sample of river

water. Over 11 weekdays. she ohser cd

14 12 21 28 30 63 29 63 55 19 20

suspended solids (parts per million).

Tutorial 1

(c)

2.(,? 搃t

(a)

(h)

(a)

(h)

Draw a dot diagram.

Find the median and the mean. Locate both on the

dot diagram.

Filid the variance and standard ariation.

h reference to Exercise 2.68.

find the quartiles:

find the minimum. maximum. range. and ?

terquartile range:

(c) construct a boxplot.

2.75 Civil engineers must monitor flow on rivers where

power is generated. The following are the daily mean

flow rates in millions of gallons per day (MGD) on

the Namekagon River during the month of May for

47 years.

602.0

517.5

572.5

392.4

505.8

547.5

389.1

497.2

794.8

657.6

904.7

595.5

611.9

482.9

698.6

606.7

986.4

567.7

400.1

634.9

448.4

479.1

1

156.0

718.5

575.6

743.3

1146.0

461.6

644.0

480.8

429.1

626.9

833.9

889.0

752.6

516.5

817.2

895.8

572.2

563.7

679.3

738.0

618.9

390.8

550.9

425.9

760.6

(a)

(b)

(C)

Obtain the quartiles.

Obtain the 90th percentile.

Construct a histogram.