

Index

A

Alternative hypothesis, 178
Analysis of variance (ANOVA), 150–151, 178
ANOVA. *See* Analysis of variance (ANOVA)
Average, 29–30, 45, 47, 62, 168, 178

B

Bar chart, 15–17, 179
Bartlett's test, 150
Bias, 95, 111, 116–119, 178
Binomial distribution, 85–91, 96–98, 100, 153,
159–162, 166–168, 178
Bubble plot, 22

C

Centre line, 78, 178
Chi-squared distribution, 71, 102, 105, 106,
165, 167, 168, 170–171, 178
Chi-squared test, 100–103, 107
Cluster sampling, 121–123, 172, 178
Coefficient of correlation, 129, 131, 132, 134,
135, 166, 168, 178
Coefficient of variation, 41, 42, 44, 45,
74, 178
Confidence interval, 62–73, 92, 95, 99–100,
103–104, 116, 132, 135, 141, 142, 147,
148, 164–168, 172, 178
Control charts, 76–80, 178
Control limits, 77, 178

D

Data collection, 1–13
Degrees of freedom, 67, 69, 71, 72, 105, 106,
108, 116, 134, 141, 142, 145–147, 149,
165–167, 169–171, 178
Density function, 49–50, 52–54, 68, 98, 103,
106, 135, 179
Dispersion, 29, 35–42, 111, 164, 179
Distribution function, 49–50, 52–54, 60, 98,
168, 179

E

Estimate, 2, 3, 62, 67, 90, 91, 179
Event, 154–158, 160, 179
Experiment, 4–5, 91, 111, 112, 115, 116, 139,
148, 179

F

Fitness Club, 4, 13, 15, 18, 20, 22–24, 31, 32,
39, 41, 43, 55, 59–61, 64–65, 75, 90, 95,
100, 104, 107, 108, 114, 117, 118, 121,
123, 128, 139, 144, 174
Fractile, 50–55, 165, 168–171, 179
Frequency, 91–94, 179
Frequency table, 100–109, 167, 168

G

Geometric average, 76

H

Histogram, 17–19, 27, 28, 47, 48, 55, 61, 75, 179
 Hypothesis, 96, 98, 99, 101, 102, 104, 105, 134, 135, 141–143, 145–147, 149, 178

I

Independent events, 158, 179
 Inter-quartile Range (IQR), 38–40, 42, 45, 55, 56, 164, 165, 179
 IQR. *See* Inter-quartile Range (IQR)

K

Kurtosis, 43, 56–59, 68, 165, 168, 179

L

Line charts, 21–22
 Linear regression, 127, 131–133, 136, 168
 Location, 28–34, 45, 164, 179
 Lognormal distribution, 74–76, 179

M

Matched pairs, 139–143, 165
 Mean, 29, 34, 48–51, 53, 55, 56, 62–69, 86–88, 92, 111, 116, 141, 142, 144–148, 161–162, 165, 168, 180
 Median, 29, 31–34, 39, 40, 42, 45, 51, 55, 56, 164, 165, 168, 180
 Method of least squares, 128, 180
 Mode, 32–34, 42, 45, 168, 180
 Multiple regression, 127, 136

N

Non-response, 10, 12, 13, 116, 180
 Normal distribution, 47, 48, 50–84, 87–89, 98, 164–166, 169, 180
 Null hypothesis, 96, 180

O

Off spec production, 82
 One-sided test, 180
 Outcome, 154–157, 159, 180

P

Percentages, 23–25
 Pie chart, 19

Population, 1–4, 6, 7, 29, 37, 48, 62–65, 85, 88, 90–92, 94, 95, 113, 114, 116–118, 120–122, 124, 167, 172, 180
 Probability of event, 100, 154–156, 158, 180
 Process capability, 80–84
 Process capability index, 81–84
 P-value, 98–100, 151, 180

Q

Quartile, 39, 40, 42, 55, 164, 168, 180

R

Random error, 111–116, 118, 123, 180
 Random numbers, 60–62, 119, 123
 Random variation, 27–29, 35, 111, 129, 132
 Randomization, 112, 117, 119, 123, 124, 180
 Range, 35–36, 41, 42, 45, 180
 Registers, 6–7, 13, 24
 Regression analysis, 127, 180
 Regression line, 60, 129, 131, 132, 134, 181
 Representative sample, 3, 24, 95–96, 117–119, 124, 181

S

Sample, 2–4, 35, 37, 48, 61, 62, 88, 90, 111, 113–125, 172–174, 181
 Sample space, 154–158, 181
 Sampling, 111, 113–125, 181
 Sampling fraction, 65, 94, 181
 Sampling unit, 117–119, 121–124, 181
 Scatter plot, 20, 22, 60
 Significance level, 99, 181
 Simple random sampling, 119–123, 172, 181
 Simulation, 61
 Six Sigma Quality, 83
 Skewness, 43, 56–59, 165, 168, 181
 Sources of errors, 6, 10–12, 111, 113–125
 Specification limits, 81, 181
 Standard deviation, 36–38, 40, 42, 45, 47–49, 70–72, 86–88, 115, 162, 164–166, 168, 181
 Standard error, 43, 63, 65, 67, 70, 141, 181
 Statistical control, 77
 Statistical Process Control (SPC), 77
 Statistical test, 96–100, 104, 106, 144, 148–149, 164, 166, 167, 178
 Statistical uncertainty, 47, 62, 64–66, 69, 74, 90–96, 99, 104, 112–116, 119–124, 148, 166, 167, 172, 173, 181

Stratified sampling, 120–121,
172, 181
Supplementary runs rules, 78, 181
Survey, 1–13, 15, 172–174, 181
Systematic errors. *See* Bias
Systematic variation, 27–29, 35, 111

T

Tables, 22–25, 169–172
 t -distribution, 58, 67–69, 73, 141–143, 146,
147, 165, 166, 168–170, 182

t -test, 135, 137, 139–143, 146, 148–150,
165, 168
Two-sided test, 97, 180, 182

V

Variance, 27, 36–38, 72, 86, 87, 161–162,
168, 182

W

Western Electric rules, 78