

# BRIEF PREVIEW OF INDIVIDUAL CHAPTERS:

## CH1: MAIN DEFINITIONS

- **POPULATION** (E.G. ALL ADULT CANADIANS)
- **SAMPLE**

**DATA** - A MATRIX STRUCTURE OF **VARIABLES** (E.G. AGE, SALARY,...) AND **CASES** (INDIVIDUALS)

## CH2: ORGANIZING DATA

ANY ONE VARIABLE CAN BE TALLIED INTO A **FREQUENCY TABLE** - GRAPHICALLY DISPLAYED IN A **HISTOGRAM**

## CH3: REDUCING DATA

MEAN AND MEDIAN, STANDARD DEVIATION AND QUARTILES

## CH4: PROBABILITY

RANDOM EXPERIMENTS (ROLLING A DIE, DEALING A FEW CARDS), **EVENTS**, INTERSECTION AND UNION AND THEIR **PROBABILITIES**. COUNTING NUMBER OF POSSIBLE OUTCOMES - PERMUTATIONS, COMBINATIONS.

## CH5: RANDOM VARIABLE

RANDOM EXPERIMENT YIELDING IN A SINGLE NUMBER (E.G. TOTAL NUMBER OF DOTS, ACES,...) AND THEIR **DISTRIBUTION** (PROBABILITY OF ALL POSSIBLE OUTCOMES), THE CORRESPONDING DISTRIBUTION **MEAN, STANDARD DEVIATION.**

**BINOMIAL FORMULA.**

## CH6: NORMAL DISTRIBUTION

APPLIES TO RANDOM VARIABLES HAVING REAL VALUES.

**PROBABILITY DENSITY** (BELL SHAPED CURVE).

WORKING WITH TABLES.

## CH7: SAMPLING

SAMPLE MEAN AND STANDARD DEVIATION AS RANDOM VARIABLES (**CENTRAL LIMIT THEOREM**).

## CH8: ESTIMATION OF:

- POPULATION **MEAN** (BY SAMPLE MEAN - **CONFIDENCE INTERVAL**)
- POPULATION **PROPORTION**
- **DIFFERENCE** OF TWO POPULATION MEANS

## CH9: HYPOTHESIS TESTING

### TEST A CLAIM ABOUT

- POPULATION **MEAN** (EQUALS TO \$45000)
- POPULATION **PROPORTION**
- **DIFFERENCE** OF TWO POPULATION MEANS (USUALLY THAT THERE IS NONE).

## CH10: REGRESSION ANALYSIS

SALARY USUALLY INCREASES WITH YEARS OF SERVICE - WE WILL FIND EXACTLY BY HOW MUCH, BY **FITTING THE BEST STRAIGHT LINE** TO OUR SET OF OBSERVATIONS

# CH11: MORE HYPOTHESES TESTING

- TESTING **INDEPENDENCE** OF TWO ATTRIBUTES (PARTY SUPPORT OF MALE AND FEMALE VOTERS)
- IS A DIE REGULAR OR CROOKED (**GOODNESS OF FIT**)
- DO THREE OR MORE POPULATIONS HAVE THE SAME MEAN? (**ANALYSIS OF VARIANCE**)

## CH12: NONPARAMETRIC TESTS

- **SIGN TEST** (BLOOD PRESSURE BEFORE AND AFTER TAKING A MEDICATIONS - DID IT DROP OR NOT)
- **RANK-SUM TEST** (HAVING TWO GROUPS, SAY MEN AND WOMEN - IS IT MORE EFFECTIVE FOR ONE THAN OTHER)
- **RANK CORRELATION** - HOW CLOSELY RELATED ARE TWO ATTRIBUTES (VARIABLES) SUCH AS AGE AND SALARY - ARE THEY RELATED AT ALL (IS SALARY INDEPENDENT OF AGE).