

PEOPLE'S DEMOCRATIC REPUBLIC of ALGERIA MINISTRY of HIGHER EDUCATION and
 SCIENTIFIC RESEARCH NATIONAL POLYTECHNIC INSTITUTE MALEK BENNABI of CONSTANTINE
 COURSE HANDOUT PROBABILITY and STATISTICS Mohamed BOUKELLOUA Academic year
 2023/2024 Contents Introduction 3 Part I: Descriptive Statistics 4 1 Statistical series with one character 5
 1.1 Introduction .To calculate them, we use the method of linear interpolation. Qualitative character They
 are measures of "types" and may be represented by names or symbols. They are related to categorical
 variables. The modalities of a qualitative character are words or symbols. Qualitative characters may
 also be represented by number codes. 6 Quantitative character They are measures of values or counts
 and are expressed as numbers. They are related to numeric variables. Quantitative characters may be
 discrete or continuous. – Discrete quantitative character (or discrete statistical variable): It is a variable
 that takes on distinct and countable values. The set of values of such a variable is finite or countable (at
 most countable). The modalities are distinct numbers. – Continuous quantitative character (or continuous
 statistical variable): It is a variable that takes on an infinite number of possible values within a given
 range. The set of values of such a variable is infinite and uncountable. The modalities are intervals
 called "Class intervals". Differential diagram (Line graph) The line graph consists of vertical lines
 representing the values of X . The height of the line corresponding to x_i is determined by either n_i or f_i .
 Integral diagram (Cumulative frequency curve) To define this graphic, we need first to define the
 cumulative absolute frequencies and the cumulative relative frequencies., $([e_{k-1}, e_k[, n_k)\}$ be a
 statistical series corresponding to a continuous statistical variable X . Arithmetic mean The arithmetic
 mean of X is defined by $\bar{X} = \frac{1}{n} \sum_{i=1}^n kX_i = \frac{1}{n} \sum_{i=1}^n n_i c_i = \sum_{i=1}^n f_i c_i$, where $c_i = \frac{e_i - 1}{2} + e_i$ is the centre of the i th
 class $[e_{i-1}, e_i[$. 96 2 Introduction In the present course, we study fundamental notions in the descriptive
 statistics and the probability theory, in accordance with the programs of mathematics of the preparatory
 classes leading to the engineering institutes, the common cores of sciences and technology,
 mathematics and computer science and the sciences of matter., $([e_{k-1}, e_k[, n_k)\}$ be a statistical series
 corresponding to a continuous statistical variable X . Variance and standard deviation The variance of X
 is defined by $V ar(X) = \frac{1}{n} \sum_{i=1}^n kX_i^2 - \bar{X}^2 = \frac{1}{n} \sum_{i=1}^n n_i c_i^2 - \bar{X}^2$ and the standard deviation of X is
 defined by $\sigma_X = \sqrt{V ar(X)}$. Example 3 (continued): To draw the graphical representations of this statistical
 series, we need to calculate the magnitudes (di) 1