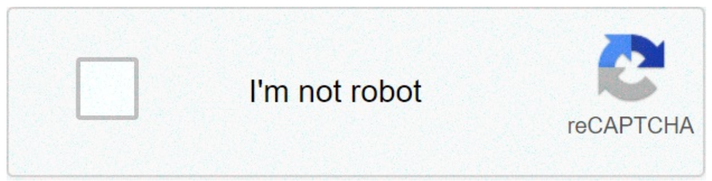

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Statistics and probability grade 11 module pdf

Statistics Approximately 34 million children and adults have diabetes in the United States. The numbers associated with diabetes make a strong case for devoting more resources to finding a cure. Read more The national cost of diabetes in the U.S. in 2017 was more than $327 billion, up from $245 billion in 2012. Diabetes is growing at an epidemic rate in the United States. And what's true nationwide is also true in each state. Statistics 2 at Berkeley is an introductory class taken by about 1000 students each year. Stat2.2x is the second of three five-week courses that make up Stat2x, the online equivalent of Berkeley's Stat 2. The focus of Stat2.2x is on probability theory: exactly what is a random sample, and how does randomness work? If you buy 10 lottery tickets instead of 1, does your chance of winning go up by a factor of 10? What is the law of averages? How can polls make accurate predictions based on data from small fractions of the population? What should you expect to happen "just by chance"? These are some of the questions we will address in the course. We will start with exact calculations of chances when the experiments are small enough that exact calculations are feasible and interesting. Then we will step back from all the details and try to identify features of large random samples that will help us approximate probabilities that are hard to compute exactly. We will study sums and averages of large random samples, discuss the factors that affect their accuracy, and use the normal approximation for their probability distributions. Be warned: by the end of Stat2.2x you will not want to gamble. Ever. (Unless you're really good at counting cards, in which case you could try blackjack, but perhaps after taking all these edX courses you'll find other ways of earning money.) The fundamental approach of the series was provided in the description of Stat2.1x and appears here again: There will be no mindless memorization of formulas and methods. Throughout the course, the emphasis will be on understanding the reasoning behind the calculations, the assumptions under which they are valid, and the correct interpretation of results. FAQ What is the format of the class? Instruction will be consist of brief lectures and exercises to check comprehension. Grades (Pass or Not Pass) will be decided based on a combination of scores on short assignments, quizzes, and a final exam. How much does it cost to take the course? Nothing! The course is free. Will the text of the lectures be available? Yes. All of our lectures will have transcripts synced to the videos. Do I need to watch the lectures live? No. You can watch the lectures at your leisure. Will certificates be awarded? Yes. Online learners who achieve a passing grade in a course can earn a certificate of achievement. These certificates will indicate you have successfully completed the course, but will not include a specific grade. Certificates will be issued by edX under the name of BerkeleyX, designating the institution from which the course originated. Can I contact the Instructor or Teaching Assistants? Yes, but not directly. The discussion forums are the appropriate venue for questions about the course. The instructors will monitor the discussion forums and try to respond to the most important questions; in many cases response from other students and peers will be adequate and faster. Do I need any other materials to take the course? If you have any questions about edX generally, please see the edX FAQ. What is a random sample, and how does randomness work How to work with exact calculations of chances when the experiments are small How to identify features of large random samples that will help us approximate probabilities that are hard to compute exactly Receive an instructor-signed certificate with the institution's logo to verify your achievement and increase your job prospectsAdd the certificate to your CV or resume, or post it directly on LinkedInGive yourself an additional incentive to complete the courseedX, a non-profit, relies on verified certificates to help fund free education for everyone globally This course provides an introduction to basic probability concepts. Our emphasis is on applications in science and engineering, with the goal of enhancing modeling and analysis skills for a variety of real-world problems. In order to make the course completely self-contained (and to bring back long-lost memories), we'll start off with Bootcamp lessons to review concepts from set theory and calculus. We'll then discuss the probability axioms that serve as the basis for all of our subsequent work – what makes probability tick? That discussion will give us the tools to study elementary probability counting rules, including permutations and combinations. We'll use these rules to work on various cool applications, including poker probability calculations and baseball line-ups! The next venues on our tour are the concepts of independence and conditional probability, which allow us to see how the probabilities of different events are related to each other, and how new information can be used to update probabilities. The course culminates in a discussion of Bayes Rule and its various interesting consequences related to probability updates.Upon completion of this course, learners will be able to: • Review Bootcamp lessons based on set theory and calculus • Identify underlying probability axioms • Apply elementary probability counting rules, including permutations and combinations • Recall the concepts of independence and conditional probability • Determine how to update probabilities via Bayes Rule"FCPS" refers to the free text, A First Course in Probability and Statistics Module 1: Course Introduction + Bootcamps • Lesson 1: Introduction to Probability and Statistics (FCPS §1.1) • Lesson 2 [OPTIONAL]: The Joy of Sets Bootcamp (FCPS §1.2.1) • Lesson 3 [OPTIONAL]: Calculus Bootcamp: Introduction + Derivatives (FCPS §1.2.2) • Lesson 4 [OPTIONAL]: Calculus Bootcamp: Integration and Beyond (FCPS §1.2.2) Module 2: Getting Started with Probability • Lesson 1: Experiments, Sample Spaces, and Events (FCPS §§1.3.1−1.3.2) • Lesson 2: What is Probability? (FCPS §1.3.3) • Lesson 3: Basic Probability Results (FCPS §1.3.3) • Lesson 4: Finite Sample Spaces (FCPS §1.4) • Lesson 5: Counting Techniques: Baby Examples (FCPS §1.5.1) • Lesson 6: Counting Techniques: Permutations (FCPS §1.5.2) • Lesson 7: Counting Techniques: Combinations (FCPS §1.5.3) Module 2 (cont'd): Getting Started with Probability • Lesson 8: Hypergeometric, Binomial, and Multinomial Problems (FCPS §§1.6.1−1.6.3) • Lesson 9: Permutations vs. Combinations (FCPS §1.6.4) • Lesson 10: The Birthday Problem (FCPS §1.6.5) • Lesson 11: The Envelope Problem (FCPS §1.6.6) • Lesson 12: Poker Problems (FCPS §1.6.7) • Lesson 13: Conditional Probability (FCPS §1.7.1) • Lesson 14: Independence Day (FCPS §1.7.2) • Lesson 15: Partitions and the Law of Total Probability (FCPS §1.8) • Lesson 16: Bayes Theorem (FCPS §1.8)Receive an instructor-signed certificate with the institution's logo to verify your achievement and increase your job prospectsAdd the certificate to your CV or resume, or post it directly on LinkedInGive yourself an additional incentive to complete the courseedX, a non-profit, relies on verified certificates to help fund free education for everyone globally*What if I haven't had math in a while? Answer: Don't worry! The course is self-contained, with all of the prerequisite material given in bootcamps at the beginning of the course. *Will there be much programming? Answer: A little, but you'll be handle that in Excel or Matlab or whatever your favorite programming application is. The job of a data scientist is to glean knowledge from complex and noisy datasets. Reasoning about uncertainty is inherent in the analysis of noisy data. Probability and Statistics provide the mathematical foundation for such reasoning. In this course, part of the Data Science MicroMasters program, you will learn the foundations of probability and statistics. You will learn both the mathematical theory, and get a hands-on experience of applying this theory to actual data using Jupyter notebooks. Concepts covered included: random variables, dependence, correlation, regression, PCA, entropy and MDL. The mathematical foundations for machine learning Statistics literacy: understand the meaning of statements such as "at a 99% confidence level" Receive an instructor-signed certificate with the institution's logo to verify your achievement and increase your job prospectsAdd the certificate to your CV or resume, or post it directly on LinkedInGive yourself an additional incentive to complete the courseedX, a non-profit, relies on verified certificates to help fund free education for everyone globallyUnfortunately, learners from one or more of the following countries or regions will not be able to register for this course: Iran, Cuba and the Crimea region of Ukraine. While edX has sought licenses from the U.S. Office of Foreign Assets Control (OFAC) to offer our courses to learners in these countries and regions, the licenses we have received are not broad enough to allow us to offer this course in all locations. edX truly regrets that U.S. sanctions prevent us from offering all of our courses to everyone, no matter where they live. Probability and statistics are two closely related mathematical subjects. Both use much of the same terminology and there are many points of contact between the two. It is very common to see no distinction between probability concepts and statistical concepts. Many times material from both of these subjects gets lumped under the heading "probability and statistics," with no attempt to separate what topics are from which discipline. Despite these practices and the common ground of the subjects, they are distinct. What is the difference between probability and statistics? The main difference between probability and statistics has to do with knowledge. By this, we refer to what are the known facts when we approach a problem. Inherent in both probability and statistics is a population, consisting of every individual we are interested in studying, and a sample, consisting of the individuals that are selected from the population. A problem in probability would start with us knowing everything about the composition of a population, and then would ask, "What is the likelihood that a selection, or sample, from the population, has certain characteristics?" We can see the difference between probability and statistics by thinking about a drawer of socks. Perhaps we have a drawer with 100 socks. Depending upon our knowledge of the socks, we could have either a statistics problem or a probability problem. If we know that there are 30 red socks, 20 blue socks, and 50 black socks, then we can use probability to answer questions about the makeup of a random sample of these socks. Questions of this type would be: "What is the probability that we draw two blue socks and two red socks from the drawer?" "What is the probability that we pull out 3 socks and have a matching pair?" "What is the probability that we draw five socks, with replacement, and they are all black?" If instead, we have no knowledge about the types of socks in the drawer, then we enter into the realm of statistics. Statistics help us to infer properties about the population on the basis of a random sample. Questions that are statistical in nature would be: A random sampling of ten socks from the drawer produced one blue sock, four red socks, and five black socks. What is the total proportion of black, blue and red socks in the drawer? We randomly sample ten socks from the drawer, write down the number of black socks, and then return the socks to the drawer. This process is done five times. The mean number of socks is for each of these trials is 7. What is the true number of black socks in the drawer? Of course, probability and statistics do have much in common. This is because statistics are built upon the foundation of probability. Although we typically do not have complete information about a population, we can use theorems and results from probability to arrive at statistical results. These results inform us about the population. Underlying all of this is the assumption that we are dealing with random processes. This is why we stressed that the sampling procedure we used with the sock drawer was random. If we do not have a random sample, then we are no longer building upon assumptions that are present in probability. Probability and statistics are closely linked, but there are differences. If you need to know what methods are appropriate, just ask yourself what it is that you know. Concepts in Probability and Statistics is an elective course in high school that aims to help students apply statistics ideas to real-world situations. It is ideal for students needing an alternative math credit, but who may not wish to pursue more advanced mathematics courses such as Algebra II and Pre-Calculus. This page provides information on Time4Learning's statistics and probability online course, why understanding probability and statistics is important, and what you can expect your high schooler to learn in this two-semester elective. Often without realizing it, we all benefit from statistics and probability every day. From weather reports to medical test results, from election polls to census data, probability and statistical language and concepts inform every aspect of our society. An introduction to probability and statistics gives high schoolers the ability to judge whether the conclusions drawn from data are accurate. A successful high school statistics curriculum will help students become informed, critical users of data who can apply them meaningfully in their everyday lives. In an era where citizens are bombarded with arguments for and against everything from political positions to medical interventions, those who have taken a course in statistics and probability for high school are in a better position to judge the validity of the claims on each side. Time4Learning's course in probability and statistics for high school begins with an in-depth study of probability, with a focus on conceptual understanding. Students then move into an exploration of sampling and comparing populations. Throughout the statistics course, students will aim for the following goals: Understand probability concepts, including the difference between theoretical probability and experimental outcomes. Express the likelihood of single and multiple events numerically. Understand sampling procedures, and make inferences about populations from appropriate samples. Compute and interpret descriptive statistics about samples, including measures of center and measures of variability. Represent data graphically in meaningful ways, including dot plots, histograms, and box plots. Represent and interpret the relationship between two variables using scatterplots and regression. Apply an understanding of normally distributed data to make and test hypotheses. Apply probability concepts to a variety of situations. Understanding Probability Sets and Venn Diagrams Permutations and Combinations Finding Outcomes Geometric Probability Theoretical Probability Experimental Probability Performance Task: Geometric Probability Models Experimental vs. Theoretical Probability Compound Events and Sample Space Compound Events and the Fundamental Counting Principle Probability of Compound Events Simulations to Estimate Probabilities Theoretical and Experimental Probability Independent and Mutually Exclusive Events Probability of Independent Events Conditional Probability Probability and Two-Way Tables Probability with Combinations and Permutations Properties of Probability Distributions Performance Task: Applying Probability Concepts Plotting Data on a Dot Plot Describing Data on Dot Plots Analyzing Dot Plots Representing Data Sets with Histograms Finding the Mean Comparing Mean and Median Range and Interquartile Range Box Plots Box Plots Mean Absolute Deviation Cumulative Exam Populations and Sampling Sampling Methods Inferences and Predictions Multiple Samples Variation in Predictions and Estimates Designing a Study Expected Value Binomial Distribution Summarizing Data Sets with Statistics Data Displays and Statistics Comparing Measures of Center and Variability Comparing Box Plots Describing Data Measures of Center Comparing Data Sets Representing Data Performance Task: Exciting Entertainment Constructing Scatterplots Interpreting Clusters and Outliers Exploring Association Drawing Trend Lines Using Equations to Represent Trend Lines Making Predictions Line of Best Fit Analyzing Residuals Strength of Correlation Regression Models Comparing Data Sets Performance Task: Super Survey Simulator Making Two-Way Tables Interpreting Two-Way Tables Two-Way Tables Relative Frequencies and Association Standard Deviation Introduction to Normal Distributions Applications with Standard Normal Distribution Statistical Inferences Hypothesis Testing Cumulative Exam Time4Learning's homeschool statistics curriculum uses unique activities and material to help high school students connect data to current, real-world dilemmas. This college-preparatory course teaches them to reason abstractly and quantitatively and make informed decisions. If your homeschooler is looking for a practical mathematics elective, this intro to probability and statistics offers: 9 chapters and more than 350 activities which cover everything from data analysis to scatterplots. Content and assignments aligned with state content standards to give students a comprehensive understanding of statistics and probability for senior high school. Activities that engage students in active learning including visual supports and note-taking guides and tools. Self-paced online instruction that uses video, printed material and virtual supports to keep different types of learners engaged. Interactive lessons that use the talents of experienced teachers to provide engagement, support, and encouragement. Ongoing, varied, and frequent assessments to check students' mastery of content. Parent access to planning and recordkeeping tools for more effective and efficient homeschooling. Customer service and support unparalleled in any other online homeschool statistics course. PreK - 8th $19.95 Monthly, first student ($14.95 monthly for each additional student) 9th - 12th $30.00 Monthly, per student (Includes 4 courses per student) Now Is the Time to Get Started! Start • Stop • Pause Anytime Sign Up

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