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AP统计学

500题

Statistics Questions

to know by test day

- 500 AP-style questions and answers
- Explanations for right and wrong answers
- What you really need to know to achieve a high score



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# AP统计学 500题

Statistics Questions  
to know by test day

• Jennifer Phan, Jerimi Ann Walker,  
and Divya Balachandran 编著



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# 前 言

AP项目（Advanced Placement Program）始于1955年，由美国大学理事会（the College Board）主持，是在高中阶段开设的具有大学水平的课程，即大学预修课程。AP课程目前设有22个门类、37个学科，已在美国15000多所高中开设。它可以使有余力、有能力、成绩优秀的高中生有机会先修部分美国大学基础课程以获得大学学分，因此吸引了很多成绩优秀的学生选修。目前，已有40多个国家的近3600所大学把AP学分作为其入学参考标准，其中包括哈佛大学、耶鲁大学、牛津大学、剑桥大学等世界知名大学。

美国每年约有200万高中毕业生，他们都要参加美国高考SAT和AP课程的考试。美国高中生会在11年级时完成SAT考试，在12年级（高中最后一年）完成两件大事：第一，根据SAT的考试成绩申请大学和奖学金；第二，选修AP课程，并进行备考。在高中选修AP课程和通过AP考试不仅是对学生能力和学业水平的证明，还可以使学生：1. 在申请大学时具有很大的优势。美国大学把学生在AP考试中的表现作为衡量其是否能够胜任大学学习的依据。从美国大学录取顾问委员会公布的影响大学录取因素的比较分析可以看出，AP成绩以80.3%的影响力位居第一，因为它向学校充分展示了学生的才智、专长及学习能力。2. 进入大学后，可以获得大学学分，免修同类课程，提早选修更高级的课程或跳级。3. 提前毕业。4. 节省大学学费。在美国，初等教育是免费的，但高等教育是收费的。选修的AP课程越多，免修的大学课程也就越多，节省的学费也就越多。另外，对中国学生而言，除了可以获得美国大学学分、省时省钱外，还可以在国内提前适应美国大学课程。

AP考试成绩的评定为5分制，满分5分表示极为优秀，4分为优秀，3分相当于合格，即可为大多数学校所接受，2分为可能有资格，1分则不予推荐。AP考试在每年5月份举行一次，为期两周。每门课程的考试时间约为2~3个小时，考试费用为每科1000元人民币或1400元港币左右。

更多信息可查询以下网站：

AP考试官网：<http://www.collegeboard.com>

AP国内报名网站：<http://apchina.net.cn>

香港考务局报名网址：<https://www2.hkeaa.edu.hk>

为满足国内考生对AP考试资料日益增长的需求，我们从美国知名教育出版公司McGraw-Hill引进了本系列AP考试丛书，分别为《AP微观/宏观经济学500题》、《AP统计学500题》、《AP美国历史500题》、《AP物理500题》和《AP化学500题》。本书为其中的《AP统计学500题》，由对AP考试有着深入研究的专家精编500道选择题，题型和难度与AP考试真题相当，全面涵盖课程精华内容。每道题均给出准确答案和详尽解析。本书中丰富的习题不但是教材内容的必要补充，还能使考生通过习题演练夯实课程基础内容，把握考试的重要信息。

或许你已经修了几门AP课程，在考前几周的冲刺阶段，需要通过做一些习题来进行最后的全面复习；或许你拖延到考试前才开始着手复习。无论你以何种形式备考，都会从本书这500道题目的练习中大有收获，因为这些题目的内容、形式、难度都与AP考试真题保持高度一致。对于考前几周的备考，本书的习题和解析是首选材料。

正所谓“熟能生巧”。如果你能完成本书练习并认真参阅解析，相信你可以掌握足够的技巧，建立充分的自信，并最终取得理想的成绩。祝你好运！

# INTRODUCTION

Congratulations! You've taken a big step toward AP success by purchasing *500 AP Statistics Questions to Know by Test Day*. We are here to help you take the next step and score high on your AP Exam so you can earn college credits and get into the college or university of your choice.

This book gives you 500 AP-style multiple-choice questions that cover all the most essential course material. Each question has a detailed answer explanation. These questions will give you valuable independent practice to supplement your regular textbook and the groundwork you are already doing in your AP classroom. This and the other books in this series were written by expert AP teachers who know your exam inside out and can identify the crucial exam information as well as questions that are most likely to appear on the exam.

You might be the kind of student who takes several AP courses and needs to study extra questions a few weeks before the exam for a final review. Or you might be the kind of student who puts off preparing until the last weeks before the exam. No matter what your preparation style is, you will surely benefit from reviewing these 500 questions, which closely parallel the content, format, and degree of difficulty of the questions on the actual AP exam. These questions and their answer explanations are the ideal last-minute study tool for those final few weeks before the test.

Remember the old saying, "Practice makes perfect." If you practice with all the questions and answers in this book, we are certain you will build the skills and confidence you'll need to do great on the exam. Good luck!

—Editors of McGraw-Hill Education

# ABOUT THE AUTHORS

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## Overview of Basic Statistics

1. Which of the following is an example of qualitative data?
  - (A) Percent of ozone loss
  - (B) AKC dog breed
  - (C) Class size
  - (D) Amount of money spent on advertising during the Super Bowl
  - (E) Gross Domestic Product (GDP) percentage
2. Which of the following is an example of quantitative data?
  - (A) Radiation levels in millirems of food in Japan
  - (B) Fashionable colors by season of the year
  - (C) Gender
  - (D) High school grade level—freshman, sophomore, junior, or senior
  - (E) Favorite sport
3. Which of the following is an example of discrete data?
  - (A) Lifetime (in hours) of 35 fluorescent light bulbs
  - (B) Weights of dogs (in pounds) at the Seal Beach Animal Care Center
  - (C) Temperature (in Fahrenheit) of the Pacific Ocean at Huntington Beach
  - (D) Number of hamburgers sold each day at Hamburger Mary's
  - (E) Amount of caffeine (in milligrams) for 8 ounces of popular drinks
4. Which of the following is an example of continuous data?
  - (A) Number of Netflix DVDs returned each day
  - (B) Number of foreclosures in Las Vegas each month
  - (C) Value of the New York Stock Exchange (NYSE) composite index each day at closing
  - (D) Number of heartbeats per minute
  - (E) Number of contacts you have on your cell phone

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5. Choose the statement below that is an example of a descriptive statistic.
- (A) The average broadband speed (mbps) for Internet access in the USA is 4.8.
  - (B) “Studies showed glaciers have lost volume on average ‘ten to 100 times faster’ in the last 30 years” compared to prior time periods.
  - (C) A random sample of surnames in Milan, Italy, showed that 32% were Torino. The study concluded that 32% of all people living in Milan have the last name Torino.
  - (D) Joe randomly sampled 10 pages of his thesis and counted 6 typographical errors. He concluded that there are 30 typographical errors in his entire 50-page thesis.
  - (E) Kaplan’s IT department extrapolated from evidence provided by teachers regarding the number of mathematical errors in the curriculum that students’ grades should be increased by 4%.
6. Choose the statement below that describes the use of inferential statistics.
- (A) The average grade on Test 3 in Spring Semester College Algebra was 63%.
  - (B) “By assessing the coloration and state of health of 195 free-living urban pigeons, they found that darker pigeons had lower concentrations of a blood parasite called haemosporidian.”
  - (C) U.S. Department of Education data from 2007–2008 found that KIPP charter schools received \$12,731 per student.
  - (D) The average age of students in Biology 101 is 23.5 years.
  - (E) The standard deviation of the pain scores from the Tylenol treatment group was 1.25.
7. Choose the statement below that describes the use of inferential statistics.
- (A) Tallest student at Saint Anthony’s High School, South Huntington, NY
  - (B) The proportion of subcompact hybrid cars in the USA reporting over 45 miles per gallon (mpg) in city driving
  - (C) The proportion of teachers belonging to a trade union based on a survey done by the National Education Association (NEA)
  - (D) Median home price in Long Beach, California, of 50 homes selected randomly from the Multiple Listing Service (MLS)
  - (E) Volatility of the New York Stock Exchange

8. Choose the statement below that describes a parameter.
- (A) Gallup poll on “life evaluation” shows 53% “thriving” and 44% “struggling.”
  - (B) Proportion of wrinkled peas in a sample collected in an organic garden
  - (C) The standard deviation of the age of students attending community college based on 10 representatives from each campus
  - (D) Average salary of all professors at San Francisco City College
  - (E) Average concentration of lactic acid in 30 samples of cheddar cheese from Cheddar Gorge, UK
9. Identify the situation where you would conduct an experiment.
- (A) A farmer wants to study the yields of three new varieties of peas developed by Monsanto, Burpee, and Heirloom.
  - (B) A poll is conducted to determine the proportion of people cheating on federal income taxes.
  - (C) An educator wishes to determine the average IQ of students pursuing a bachelor’s degree in mathematics.
  - (D) A baseball fan wishes to determine who is the best pitcher in Major League Baseball.
  - (E) A doctor wants to maintain a complete record of medical information on each patient.
10. Identify the situation where you would conduct a survey.
- (A) Gallup wishes to determine the proportion of people who see themselves as “thriving.”
  - (B) Stanford researchers want to determine the effect that improving student vision has on learning.
  - (C) A pharmaceutical company wants to advertise that its painkiller is more effective than aspirin, ibuprofen, and Tylenol.
  - (D) A gambler wishes to calculate the expected value of buying two lottery tickets.
  - (E) The U.S. Army wants to find the average cost of training a cadet.
11. Which of the following describes a random variable?
- (A) The price of a barrel of crude oil on the commodities market on April 1, 1984
  - (B) The number rolled on a fair die
  - (C) The grade earned on an exam by a student
  - (D) The time required by Jaouad Gharib to run a marathon
  - (E) The weight of a gallon of water

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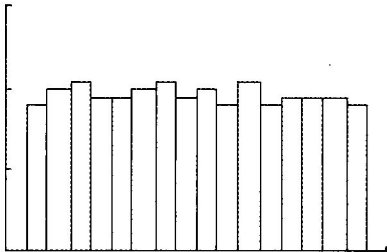
12. When we collect data for a study, why do we need to take extra care in the data collection process?
- (A) To get the right average
  - (B) So that we can generalize
  - (C) To avoid bias
  - (D) So we don't make any mistakes
  - (E) To make sure we get the best data
13. Which of the following measures central tendency?
- (A) Standard deviation
  - (B) Mean and median
  - (C) Interquartile range and range
  - (D) Variance
  - (E) Correlation coefficient
14. Which of the following measures the spread of data?
- (A) Mode and mean
  - (B) Median and interquartile range
  - (C) First and third quartiles
  - (D) Correlation coefficient
  - (E) Standard deviation and variance
15. Which statement is true?
- (A) A simple random sample should not be used in an experiment.
  - (B) Inferential statistics are used to estimate population parameters.
  - (C) Parameters are no different from statistics.
  - (D) Descriptive statistics are graphs such as scatter plots or histograms.
  - (E) Regression and correlation are used to describe a single variable.
16. What common sampling technique is the most generally useful for making inferences about a population?
- (A) Stratified sampling
  - (B) Cluster sampling
  - (C) Random sampling
  - (D) Systematic sampling
  - (E) Representative sampling

17. To study the relationship between two variables, what type of graph would you use?
- (A) Dot plot
  - (B) Histogram
  - (C) Scatter plot
  - (D) Stem plot
  - (E) Frequency polygon
18. To identify the shape of univariate data, what type of graph would be the most useful?
- (A) Ogive
  - (B) Histogram
  - (C) Scatter plot
  - (D) Pareto chart
  - (E) Pie chart
19. Researchers studied the effects that improving vision with eyeglasses had on educational outcomes. They identified 2,069 students who could improve their vision with eyeglasses. 750 were not offered eyeglasses and 1,319 were. Of the 1,319 offered eyeglasses, 928 accepted the eyeglasses. Students who received the eyeglasses scored significantly higher in both math and science. What was the treatment in this study?
- (A) Being offered eyeglasses
  - (B) Not receiving eyeglasses
  - (C) Scoring significantly higher in math
  - (D) Receiving eyeglasses
  - (E) Being identified as a student who could improve
20. A linguist studied conversation styles by gender and age to assess differences between genders. The data were collected by studying videotapes made of “best friends” who were asked to have a conversation together. Which choice best describes the type of study that was conducted?
- (A) Observational
  - (B) Experimental
  - (C) Poll
  - (D) Census
  - (E) Survey

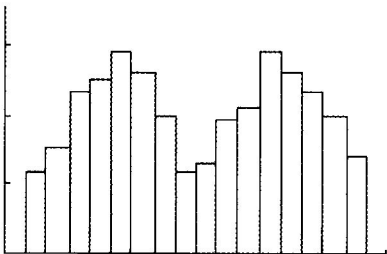


## One-Variable Data Analysis

21. Describe the shape of the histogram below.

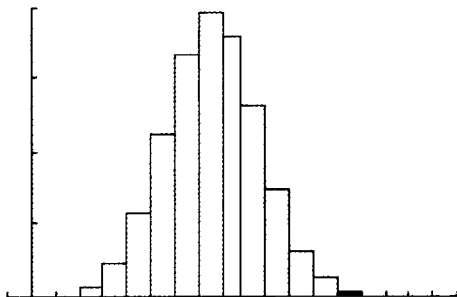


- (A) Normal
  - (B) Bimodal
  - (C) Skewed right
  - (D) Skewed left
  - (E) Uniform
22. Describe the shape of the histogram below.



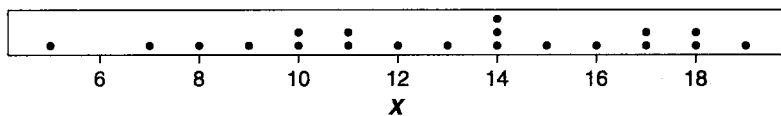
- (A) Normal
- (B) Bimodal
- (C) Skewed right
- (D) Skewed left
- (E) Uniform

23. Describe the shape of the histogram below.



- (A) Bimodal
- (B) Normal
- (C) Skewed right
- (D) Skewed left
- (E) Uniform

24. Find the mode and the median in the dot plot below ( $n = 20$ ).



- (A) Mode: 10; median: 13
- (B) Mode: 11; median: 13
- (C) Mode: 14, median: 13.5
- (D) Mode: 14; median: 14
- (E) Mode: none; median: 14

25. Find the modal group and the median in the stem plot below ( $n = 20$ ).

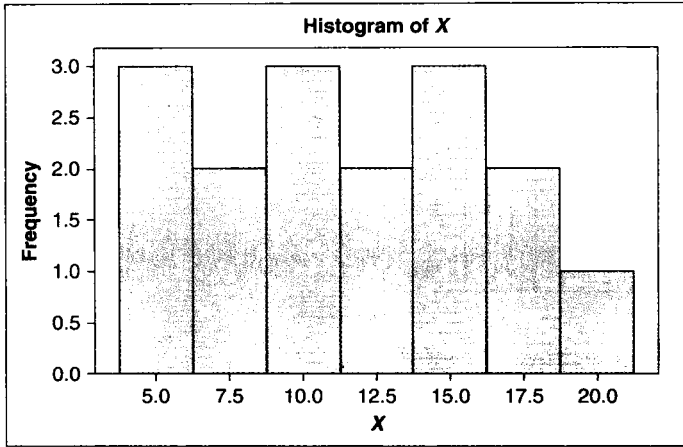
```

2  00067889
3  04499
4  02399
5  00
    
```

- (A) Modal group: 2; median: 36.5
- (B) Modal group: 3; median: 36.56
- (C) Modal group: 2; median: 32
- (D) Modal group: 2; median: 34
- (E) Modal group: 3; median: 34

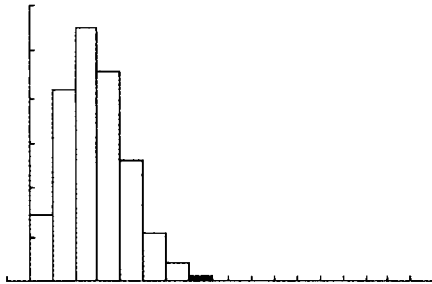


26. What are the class boundaries for the bar labeled “10” in the histogram below?



- (A) 7.5–12.5
- (B) 7.25–12.75
- (C) 8.5–11.5
- (D) 8.75–11.75
- (E) 8.75–11.25

27. In the histogram below, which of the following statements is true?



- I. The mean is greater than the median.
  - II. The mean is less than the median.
  - III. The mode is less than the median.
- (A) I only
  - (B) I and III only
  - (C) II and III only
  - (D) II only
  - (E) III only