Chapter 1. Statistics and Data

Solutions

1. 1. The population is all iPhone 4 users.
   2. Sample statistics
2. The value 35 is the estimated average age of the population. It is both costly and time consuming (likely impossible) to take a census of all video game players and compute the actual average age.
3. 1. The population is all students enrolled in the accounting class.
   2. The value 3.29 represents the population parameter since we are not choosing a sample but drawing results from the actual population.
4. 1. The population is all marketing managers.
   2. No, the average salary is a sample statistic computed from a sample, not the population.
5. 1. The population is all elderly people. The sample consists of 949 elderly people.
   2. 22% and 17% represent the sample statistics.

|  |  |
| --- | --- |
| Date | Adj. Close Price |
| Dec 10 | $593.97 |
| Nov 10 | $555.71 |
| Oct 10 | $613.70 |
| Sep 10 | $525.79 |
| Aug 10 | $450.02 |
| Jul 10 | $484.85 |
| Jun 10 | $444.95 |
| May 10 | $485.63 |
| Apr 10 | $525.70 |
| Mar 10 | $567.12 |
| Feb 10 | $526.80 |
| Jan 10 | $529.94 |

Source: Monthly Adj Close Price in 2010 from   
[*http://www.finance.yahoo.com*](http://www.finance.yahoo.com).

Retrieved April 19, 2011.

These numbers represent time series data. The adjusted close price of the stock was rather volatile, with a 12-month high in October and 12-month low in June.

1. *Note: Individual answers will vary. This is an example of what an answer may look like.*

|  |  |
| --- | --- |
| Accommodation | Monthly Expenses |
| Dorm | $435 |
| Dorm | $480 |
| Rental | $505 |
| Other | $50 |
| Rental | $600 |
| Dorm | $425 |
| Rental | $525 |
| Other | $550 |
| Other | $325 |
| Dorm | $385 |
| Rental | $475 |
| Dorm | $400 |
| Dorm | $485 |
| Rental | $485 |
| Other | $475 |
| Dorm | $425 |
| Rental | $500 |
| Dorm | $375 |
| Rental | $625 |
| Other | $350 |

This data is cross-sectional data because it can be assumed to be taken at the same point in time. The monthly lodging expenses ranges from a low of $50 to a high of $625. The average expense is $443.75.

1. *Note: The data for this website changes regularly. Therefore, individual answers will differ depending on the date the data is retrieved. This is an example of what the table may look like:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Homes | Price | Number of Beds | Square Feet | Built |
| 1 | $374,900.00 | 3 | 3073 | 2004 |
| 2 | $112,000.00 | 4 | 1788 | 2005 |
| 3 | $190,000.00 | 3 | 1467 | 2009 |
| 4 | $160,000.00 | 4 | 1891 | 2000 |
| 5 | $30,000.00 | 3 | 1026 | 1977 |
| 6 | $317,000.00 | 4 | 3465 | 2004 |
| 7 | $62,000.00 | 3 | 1362 | 1973 |
| 8 | $120,000.00 | 3 | 2005 | 2002 |
| 9 | $289,324.00 | 3 | 1705 | 2008 |
| 10 | $355,000.00 | 4 | 3648 | 2001 |
| 11 | $65,000.00 | 2 | 1296 | 1976 |
| 12 | $33,000.00 | 4 | 1696 | 1987 |
| 13 | $110,000.00 | 3 | 1376 | 2000 |
| 14 | $310,000.00 | 5 | 3716 | 2001 |
| 15 | $75,000.00 | 3 | 1230 | 2004 |
| 16 | $60,000.00 | 3 | 1285 | 2004 |
| 17 | $140,000.00 | 4 | 2217 | 2003 |
| 18 | $178,000.00 | 4 | 1967 | 1998 |
| 19 | $226,000.00 | 1 | 533 | 2006 |
| 20 | $128,000.00 | 3 | 1483 | 2006 |

Source:[*http://zillow.com/*](http://zillow.com/)*;* Retrieved August 20, 2012.

The data above is cross-sectional data. The data represents characteristics of homes sold at approximately the same time of the year.

|  |  |
| --- | --- |
| DATE | GPSAVE |
| Q1.2008 | 2138.9 |
| Q2.2008 | 2411.5 |
| Q3.2008 | 2333.9 |
| Q4.2008 | 2246.7 |
| Q1.2009 | 2503.8 |
| Q2.2009 | 2621.7 |
| Q3.2009 | 2556.6 |
| Q4.2009 | 2617.1 |
| Q1.2010 | 2781.4 |
| Q2.2010 | 2843.9 |
| Q3. 2010 | 2888.3 |
| Q4. 2010 | 2825.7 |
| Q1.2011 | 2794.6 |
| Q2.2011 | 2836.0 |
| Q3. 2011 | 2810.7 |
| Q4. 2011 | 2868.5 |

*Source:* [*http://research.stlouisfed.org/fred2/*](http://research.stlouisfed.org/fred2/)*;   
Retrieved August 20, 2012.*

These numbers represent time series data. Savings are increasing over this time period.

|  |  |
| --- | --- |
| State | Median Household Income in 2010 ($) |
| Alabama | 40,976 |
| Arizona | 47,279 |
| California | 54,459 |
| Florida | 44,243 |
| Georgia | 44,108 |
| Indiana | 46,322 |
| Iowa | 49,177 |
| Maine | 48,133 |
| Massachusetts | 61,333 |
| Minnesota | 52,544 |
| Mississippi | 37,985 |
| New Mexico | 45,098 |
| North Dakota | 51,380 |
| Washington | 56,253 |

Source: [*http://www.census.gov/*](http://www.census.gov/)*; Retrieved August 20, 2012.*

These data are estimates for 2010 – you may be able to obtain more recent estimates. These numbers represent cross-sectional data. They record the median income by family size for different states. In this particular group of states, Massachusetts has the highest median income by family size whereas Mississippi has the lowest median income. Also, states in the North such as Massachusetts, Minnesota and Washington have higher incomes than Southern states.

* 1. Quantitative; discrete
  2. Qualitative
  3. Quantitative; continuous

1. 1. Qualitative
   2. Quantitative; continuous
   3. Quantitative; discrete
2. 1. Nominal
   2. Interval
   3. Ordinal
3. 1. Ratio
   2. Ordinal
   3. Nominal
4. 1. Ratio
   2. Interval
   3. Ratio
5. 1. Nominal scale of measurement. The values differ in name.

|  |  |
| --- | --- |
| Major | # of Students |
| Accounting | 5 |
| Economics | 7 |
| Finance | 5 |
| Marketing | 3 |
| Management | 6 |
| Undecided | 4 |

1. An inspection of the data shows that Economics has the highest number of students whereas Marketing has the lowest.
2. 1. The Year data is measured on an interval scale. The values can be ranked, categorized and measured when using this kind of scale. However, there is no true zero point so we cannot calculate meaningful ratios between years.

|  |  |
| --- | --- |
| Rating | Number 0f Companies |
| \*\*\* | 12 |
| \*\*\*\* | 12 |
| \*\*\*\*\* | 6 |

The Morningstar’s based rating system is measured on an ordinal scale. The values can be ranked and categorized but the differences between ranks are meaningless. The data shows that 80% of the companies have a three and four star rating. Only 20% have a five start rating. Also, the number of three and four star companies is the same.

c. The Stock Price data is measured on a ratio scale. This type of scale is the strongest form of measurement. There is a true zero point which allows for the calculation of meaningful ratios between values.