2. Figure 5E.2 is a time-series graph charting the savings behavior of Americans from 1929 to 2002. Savings behavior is measured as the average percent of disposable income that Americans save in a given year.

Provide a summary of the savings behaviors of Americans over this 74-year period. Be sure to reference specific years or periods of years and statistics in your answer.

![Figure 5E.2](image)

Figure 5E.2  Line graph of US saving as a percentage of disposable income (1929–2001)

*Data source:* National Income and Product Account information, a popular measure of savings, taken from the US Commerce Department Bureau of Economic Analysis; Table 2.1 – Personal income and its disposition (www.bea.doc.gov/bea/dn/nipaweb/index.asp).

ANSWER: Savings was highly volatile during the 1930s and 40s. In the 1930s, with the Great Depression, savings rates plummeted, entering negative rates. With the occurrence of WWII, savings rates increased (partly by choice, partly by government regulation). Then, during the post-war period, savings rates remained relatively constant at about 9% until the Regan era and the decline during the 80s and 90s. These rates hit their lowest during the Dot-COM bubble since the rates seen during the Great Depression.

3. Figure 5E.3 is a scatterplot of the relationship between completed years of education and age at which one’s first child was born. Data were taken from the 1996 US General Social Survey data file (number of cases = 2,039).

Does there appear to be a relationship between education and age of one’s first child? Why or why not? If there is a relationship, does it appear to be strong? Does the distribution of data points appear at all unexpected or unusual to you? Explain.

![Figure 5E.3](image)

Figure 5E.3  Scatterplot of the relationship between completed years of education and age at which one’s first child was born

ANSWER: As is illustrated with the added “trend” line; we can see that as the number of years of schooling increases, so does the age when the first child is born. This correlation would imply that those individuals who seek higher levels of education postpone childbearing. The relationship does not seem very strong as there is still a very wide variation among all education levels.
4. Figure 5E.4 is a scatterplot of years of education by self-assessed social class (1 = lower class to 6 = upper class). The data were taken from the 2000 ISSP dataset and represent 131 individuals.

First, summarize the range of years of education. Does there appear to be a relationship between these two variables? How did you determine this?

![Figure 5E.4 Scatterplot of years of education and subjective social class](image)

**ANSWER:** The range varies from very low levels of education; approximately 1 year all the way to 18 years of education (equivalent of a Master’s Degree). There does not appear to be a strong relationship among the variables though the ranges are different amongst the different groups. By comparing the means visually; there does not seem to be a systematic increase or decrease in class based upon increased education rates.

Chapter 6:

1. a. Internet Time

   ![Diagram](image)

b. Childhood Poverty

   ![Diagram](image)

   Lower Educational Achievement

   Adult Poverty

   Face-To-Face Interaction
2. 
   a. Being of younger age influences the proportion of shopping done on the internet.
   b. Being of younger age impacts one's level of computer knowledge which in turn influences the amount of shopping done online versus other outlets.
   c. Being of younger age both influences the proportion of shopping done on the internet as well as impacts one's level of computer knowledge which in turn influences the amount of shopping done online versus other outlets.
5. Men attend bars more frequently on average than women. Those aged 40 and below attend bars more frequently than those aged 41 and above. The age effect dominates the gender effect because young women do attend more than older men.
Chapter 7:

1.  
   a. \( P(\text{Black}) = \frac{26}{52} \) or \( \frac{1}{2} \)  
   b. \( P(6 \text{ of Hearts}) = \frac{1}{52} \)  
   c. \( P(\text{Black and Black}) = P(\text{Black})P(\text{Black}) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4} \)  
   d. \( P(\text{Black and Red}) \) or \( P(\text{Red and Black}) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4} \)

2. Figure 7E1 is a cumulative distribution graph for the question from the ISSP data set measuring beliefs about whether humans developed from animals. There were four responses: “definitely true” (1), “probably true” (2), “probably untrue” (3), and “definitely untrue” (4).

   a) What is the probability that if a case were drawn randomly from the sample that the case would have a score of “definitely true” or “probably true”?
   b) What is the probability that if a case were drawn randomly from the sample that the case would have a score of “definitely true,” “probably true,” or “probably untrue”?

ANSWERS:

   a. \( 20\% = 100\% - P(\text{Not “Definitely Untrue”}) \)  
   b. \( 80\% = 100\% - P(\text{“Definitely Untrue”}) \)

Additional problems:

You are given the following information:
   \( S = \{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15\} \)  
   A={odd}  
   B={even}  
   C={1,2,3,4,5}  
   D={6,7,8,9,10}  
   E={11,12,13,14,15}  
   F={5,6,7,8,9,10,11}  

Give the following sets and probabilities:

1. \( A \cup B = \{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15\} \)  
2. \( A \cap D = \{7,9\} \)  
3. \( A’ = \{2,4,6,8,10,12,14\} \)  
4. \( A \cup F = \{1,3,5,6,7,8,9,10,11,13,15\} \)  
5. \( P(A) = \frac{8}{15} \)  
6. \( P(A \cup B) = 1 \)  
7. \( P(D \cap E) = 0 \)  
8. \( P(C \cap D \cap E \cap F) = 0 \)  
9. \( P(A|F) = \frac{4}{7} \)  
10. \( P(B|F) = \frac{3}{7} \)  
11. \( P(F|A) = \frac{1}{2} \)  
12. \( P(F|B) = \frac{3}{7} \)