Ch3

1. A megabyte is 8000 kilobits. Write a program that will read in the bit rate in kilobits per second and the duration in minutes of a video clip and will output the file size of the video clip in megabytes.
   Define a function to compute the file size of the video clip. Your program should use a globally defined constant for the number of kilobits per megabyte.

5. Write a program that asks for the user's height, weight, and age, and then computes clothing sizes according to the following formulas.
   - Hat size = weight in pounds divided by height in inches and all that multiplied by2.9.
   - Jacket size (chest in inches) = height times weight divided by 288 and then adjusted by adding one-eighth of and inch for each 10 years over age 30. (Note that the adjustment only takes place after a full 10 years. So, there is no adjustment for ages 30 through 39, but one-eighth of an inch is added forage 40.)
   - Waist in inches = wright divided by 5.7 and then adjusted by adding one-tenth of an inch for each 2 years over age 28. (Note that the adjustment only takes place after a full 2 years. So, there is no adjustment for age 29, but one-tenth of an inch is added for age30.)

   Use functions for each calculation. Your program should allow the user to repeat this calculation as often as he or she wishes.

10. One way to estimate the height of a child is to use the following formula, which uses the height of the parents:

    $H_{male\_child} = ((H_{mother}\ 13/12)+H_{father})/2$

    $H_{female\_child} = ((H_{father}\ 12/13)+H_{mother})/2$

    All heights are in inches. Write a function that takes as input parameters the gender of the child, height of the mother in inches, and height of the father in inches, and outputs the estimated height of the child in inches. Embed your function in a program that allows you to test the function over and over again until telling the program to exit. The user should be able to input the heights in feet and inches, and the program should output the estimated height of the child in feet and inches. Use the integer data type to store the heights.

11. The program of Pig is a simple two player dice game in which the first player to reach 100 or more points wins. Player take turns. On each turn a player rolls a six-sided die:
    - If the player rolls a 2-6 then he or she can either
      - ROLL AGAIN or
      - HOLD. At this point the sum of all rolls made this turn is added to the player's total score and it becomes the other player's turn.
    - If the player rolls a 1 then the player loses his or her turn. The player gets no new points and it becomes the opponent's turn.

    If a player reaches 100 or more points after holding then the player wins.
    Write a program that play the game of Pig, where one player is a human and the other is the computer. Allow the human to input "r" to roll again or "h" to hold. The computer program should play according to the following rule: keep rolling on the computer's turn until it has accumulated 20 or more points, then hold. Of course, if the computer wins or rolls a 1 then the turn ends immediately. Allow the human to roll first.
    Write your program using at least two functions:

int humanTurn (int humanTotalScore);

int computerTurn (int computerTotalScore);

These functions should perform the necessary logic to handle a single turn for either the computer or the human. The input parameter is the total score for the human or computer. The functions should return the turn total to be added to the total score upon completion of the turn. For example, if the human rolls a 3 and 6 and then holds, then humanTurn should return 9. However, if the human rolls a 3 and 6 and then a 1, then the function should return 0.

13. You have four identical prizes to five away and a pool of 25 finalists. The finalists are assigned numbers from 1 to 25. Write a program to randomly select the numbers of 4 finalists to receiver a prize. Make sure not to pick the same number twice. For example, picking finalists 3, 15, 22 and 14 would be valid but picking 3, 3, 31, and 17 would be invalid, because finalist number 3 is listed twice and 31 is not a valid finalist number.