By submitting this assignment, I agree to the following:
  "Aggies do not lie, cheat, or steal, or tolerate those who do."
  "I have not given or received any unauthorized aid on this assignment."

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Section: 213
Team: 11
Assignment: Lab5a_Act1
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Variables:
- Sex -> sex
- Age -> age
- Points -> point_total
- Total Cholesterol -> total_cholesterol
- Smoker or Nonsmoker -> smoking_status
- HDL (mg/dL) -> hdl
- Systolic BP (mmHg) -> systolic_bp
  - If Untreated or Treated -> treated_status

Sequence of Steps:
1. Create and initialize the variables.
2. Ask for user inputs for each of the factors in heart attack risk (sex, age, smoking status, total cholesterol (mg/dL), HDL cholesterol (mg/dL), systolic BP (mmHg), taking blood pressure medication or not).
   a. Convert numbers to integers, yes/no answers to Boolean True/False.
3. Start the dichotomy tree with sex input, then the second layer of the nested if statement is age, and finally the third layer of the nested if statement are the various heart attack risk factors.
4. If the sex is male, go to the male branch.
   a. If the age is between 20 and 34, add -9 to the total points.
      If the age is between 35 and 39, add -4 to the total points.
      If the age is between 40 and 44, add 0 to the total points.
      If the age is between 45 and 49, add 3 to the total points.
      If the age is between 50 and 54, add 6 to the total points.
      If the age is between 55 and 59, add 8 to the total points.
      If the age is between 60 and 64, add 10 to the total points.
      If the age is between 65 and 69, add 11 to the total points.
      If the age is between 70 and 74, add 12 to the total points.
      If the age is between 75 and 79, add 13 to the total points.
   b. If the age is between 20 and 39:
      i.   If Cholesterol is lower than 160, add 0 to the total points.
      ii. If Cholesterol is under 160, add 0 to the total points
      iii. If Cholesterol is between 161 and 199, add 4 to the total points.

  iv. If Cholesterol is between 200 and 239, add 7 to the total points.

  v. If Cholesterol is between 240 and 279, add 9 to the total points.

  vi. If Cholesterol is over 279, add 11 to the total points.

c. If the age is between 40 and 49:

  i. If Cholesterol is lower than 160, add 0 to the total points.

  ii. If Cholesterol is between 160 and 199, add 3 to the total points.

  iii. If Cholesterol is between 200 and 239, add 5 to the total points.

  iv. If Cholesterol is between 240 and 279, add 6 to the total points.

  v. If Cholesterol is over 279, add 8 to the total points.

d. If the age is between 50 and 59:

  i. If Cholesterol is lower than 160, add 0 to the total points.

  ii. If Cholesterol is between 160 and 199, add 2 to the total points.

  iii. If Cholesterol is between 200 and 239, add 3 to the total points.

  iv. If Cholesterol is between 240 and 279, add 4 to the total points.

  v. If Cholesterol is over 279, add 5 to the total points.

e. If the age is between 60 and 69:

  i. If Cholesterol is lower than 160, add 0 to the total points.

  ii. If Cholesterol is between 160 and 199, add 1 to the total points.

  iii. If Cholesterol is between 200 and 239, add 1 to the total points.

  iv. If Cholesterol is between 240 and 279, add 2 to the total points.

  v. If Cholesterol is over 279, add 3 to the total points.

f. If the age is between 70 and 79:

  i. If Cholesterol is lower than 160, add 0 to the total points.

  ii. If Cholesterol is between 160 and 199, add 0 to the total points.

  iii. If Cholesterol is between 200 and 239, add 0 to the total points.

  iv. If Cholesterol is between 240 and 279, add 1 to the total points.

  v. If Cholesterol is over 279, add 1 to the total points.

g. If nonsmoker, add 0 points to the total points.

 If smoker, go down smoking male branch.

  i. If the age is between 20 and 39, add 8 to the total points.

  ii. If the age is between 40 and 49, add 5 to the total points.

  iii. If the age is between 50 and 59, add 3 to the total points.

  iv. If the age is between 60 and 79, add 1 to the total points.

h. If HDL is greater than or equal to 60, add -1 to the total points.

 If HDL is between 50 and 59, add 0 to the total points.

 If HDL is between 40 and 49, add 1 to the total points.

 If HDL is less than 40, add 2 to the total points.

i. If systolic BP is untreated:

  i. If systolic BP is less than 120, add 0 to the total points.

  If systolic BP is between 120 and 129, add 0 to the total points.

  If systolic BP is between 130 and 139, add 1 to the total points.

  If systolic BP is between 140 and 159, add 1 to the total points.

  If systolic BP is 160 or greater, add 2 to the total points.

j. If systolic BP is treated:

      i.   If systolic BP is less than 120, add 0 to the total points.

           If systolic BP is between 120 and 129, add 1 to the total points.

           If systolic BP is between 130 and 139, add 2 to the total points.

           If systolic BP is between 140 and 159, add 2 to the total points.

           If systolic BP is 160 or greater, add 3 to the total points.

5. If the sex is female, go down the branch
   a. If the age is between 20 and 34, add -7 to total points.

      If the age is between 35 and 39, add -3 to total points.

      If the age is between 40 and 44, add 0 to total points.

      If the age is between 45 and 49, add 3 to total points.

      If the age is between 50 and 54, add 6 to total points.

      If the age is between 55 and 59, add 8 to total points.

      If the age is between 60 and 64, add 10 to total points.

      If the age is between 65 and 69, add 12 to total points.

      If the age is between 70 and 74, add 14 to total points.

      If the age is between 75 and 79, add 16 to total points.
   b. If the age is between 20 and 39:
      i. If Cholesterol is lower than 160, add 0 to the total points.
      ii. If Cholesterol is between 16 and 199, add 4 to the total points.
      iii. If Cholesterol is between 200 and 239, add 8 to the total points.
      iv. If Cholesterol is between 240 and 279, add 11 to the total points.
      v. If Cholesterol is over 279, add 13 to the total points.
   c. If the age is between 40 and 49:
      i. If Cholesterol is lower than 160, add 0 to the total points.
      ii. If Cholesterol is between 160 and 199, add 3 to the total points.
      iii. If Cholesterol is between 200 and 239, add 6 to the total points.
      iv. If Cholesterol is between 240 and 279, add 8 to the total points.
      v. If Cholesterol is over 279, add 10 to the total points.
   d. If the age is between 50 and 59:
      i. If Cholesterol is lower than 160, add 0 to the total points.
      ii. If Cholesterol is between 160 and 199, add 2 to the total points.
      iii. If Cholesterol is between 200 and 239, add 4 to the total points.
      iv. If Cholesterol is between 240 and 279, add 5 to the total points.
      v. If Cholesterol is over 279, add 7 to the total points.
   e. If the age is between 60 and 69:
      i. If Cholesterol is lower than 160, add 0 to the total points.
      ii. If Cholesterol is between 160 and 199, add 1 to the total points.
      iii. If Cholesterol is between 200 and 239, add 2 to the total points.
      iv. If Cholesterol is between 240 and 279, add 3 to the total points.
      v. If Cholesterol is over 279, add 4 to the total points.
   f. If the age is between 70 and 79:
      i. If Cholesterol is lower than 160, add 0 to the total points.
      ii. If Cholesterol is between 160 and 199, add 1 to the total points.
      iii. If Cholesterol is between 200 and 239, add 1 to the total points.

<ol style="list-style-type: lower-roman;">
<li value="4">If Cholesterol is between 240 and 279, add 2 to the total points.
If Cholesterol is over 279, add 2 to the total points.

   g. If nonsmoker, add 0 points to the total points.

       If smoker, go down smoking female branch.

<ol style="list-style-type: lower-roman;">
If the age is between 20 and 39, add 9 to the total points.
If the age is between 40 and 49, add 7 to the total points.
If the age is between 50 and 59, add 4 to the total points.
If the age is between 60 and 69, add 2 to the total points.
If the age is between 70 and 79, add 1 to the total points.

   h. If HDL is greater than or equal to 60, add -1 to the total points.

       If HDL is between 50 and 59, add 0 to the total points.

       If HDL is between 40 and 49, add 1 to the total points.

       If HDL is less than 40, add 2 to the total points.

   i. If systolic BP is untreated:

<ol style="list-style-type: lower-roman;">
If systolic BP is less than 120, add 0 to the total points.
If systolic BP is between 120 and 129, add 1 to the total points.
If systolic BP is between 130 and 139, add 2 to the total points.
If systolic BP is between 140 and 159, add 3 to the total points.
If systolic BP is 160 or greater, add 4 to the total points.

   j. If systolic BP is treated:

<ol style="list-style-type: lower-roman;">
If systolic BP is less than 120, add 0 to the total points.
If systolic BP is between 120 and 129, add 3 to the total points.
If systolic BP is between 130 and 139, add 4 to the total points.
If systolic BP is between 140 and 159, add 5 to the total points.
If systolic BP is 160 or greater, add 6 to the total points.

6. Point total to 10 year risk %:

   a. If the sex is male:

<ol style="list-style-type: lower-roman;">
If point total < 0, 10 year risk % is < 1%.
If point total = 0, 10 year risk % is 1%.
If point total = 1, 10 year risk % is 1%.
If point total = 2, 10 year risk % is 1%.
If point total = 3, 10 year risk % is 1%.
If point total = 4, 10 year risk % is 1%.
If point total = 5, 10 year risk % is 2%.
If point total = 6, 10 year risk % is 2%.
If point total = 7, 10 year risk % is 3%.
If point total = 8, 10 year risk % is 4%.
If point total = 9, 10 year risk % is 5%.
If point total = 10, 10 year risk % is 6%.
If point total = 11, 10 year risk % is 8%.
If point total = 12, 10 year risk % is 10%.
If point total = 13, 10 year risk % is 12%.
If point total = 14, 10 year risk % is 16%.
If point total = 15, 10 year risk % is 20%.

If point total = 16, 10 year risk % is 25%.

If point total >= 17, 10 year risk % is >= 30%.

    b. If the sex is female:

        i. If point total < 9, 10 year risk % is < 1%.

If point total = 9, 10 year risk % is 1%.

If point total = 10, 10 year risk % is 1%.

If point total = 11, 10 year risk % is 1%.

If point total = 12, 10 year risk % is 1%.

If point total = 13, 10 year risk % is 2%.

If point total = 14, 10 year risk % is 2%.

If point total = 15, 10 year risk % is 3%.

If point total = 16, 10 year risk % is 4%.

If point total = 17, 10 year risk % is 5%.

If point total = 18, 10 year risk % is 6%.

If point total = 19, 10 year risk % is 8%.

If point total = 20, 10 year risk % is 11%.

If point total = 21, 10 year risk % is 14%.

If point total = 22, 10 year risk % is 17%.

If point total = 23, 10 year risk % is 22%.

If point total = 24, 10 year risk % is 27%.

If point total >= 25, 10 year risk % is >= 30%.

7. Print output (Your 10-year risk of a heart attack is {}%).

Test Cases:

1. Inputs:Sex: Male, Age: 72; Output: Age-based score: 12; Type: typical
2. Inputs:Sex: Male, Age: 30; Output: Age-based score: -9; Type: typical
3. Inputs:Sex: Male, Age: 44; Output: Age-based score: 0; Type: edge
4. Inputs:Sex: Male, Age: 74; Output: Age-based score: 12; Type: edge
5. Inputs:Sex: Female, Age: 42; Output: Age-based score: 0; Type: typical
6. Inputs:Sex: Female, Age: 62; Output: Age-based score: 10; Type: typical
7. Inputs:Sex: Female, Age: 74; Output: Age-based score: 14; Type: edge
8. Inputs:Sex: Female, Age: 40; Output: Age-based score: 0; Type: edge
9. Inputs:Sex: Male, Age: 41, Total Cholestrol: 250; Output: Total Cholestrol Score: 6, Type: typical
10. Inputs:Sex: Male, Age: 41, Total Cholestrol: 199; Output: Total Cholestrol Score: 3, Type: edge
11. Inputs:Sex: Female, Age: 41, Total Cholestrol: 250; Output: Total Cholestrol Score: 8, Type: typical
12. Inputs:Sex: Female, Age: 41, Total Cholestrol: 199; Output: Total Cholestrol Score: 3, Type: edge
13. Inputs:Sex: Male, Age: 41, Smoking Status: Smoker; Output: Total Smoking Score: 5, Type: typical
14. Inputs:Sex: Male, Age: 41, Smoking Status: Nonsmoker; Output: Total Smoking Score: 0, Type: typical

15. Inputs:Sex: Male, Age: 49, Smoking Status: Smoker; Output: Total Smoking Score: 5, Type: edge
16. Inputs:Sex: Male, Age: 49, Smoking Status: Nonsmoker; Output: Total Smoking Score: 0, Type: edge
17. Inputs:Sex: Female, Age: 41, Smoking Status: Smoker; Output: Total Smoking Score: 7, Type: typical
18. Inputs:Sex: Female, Age: 41, Smoking Status: Nonsmoker; Output: Total Smoking Score: 0, Type: typical
19. Inputs:Sex: Female, Age: 49, Smoking Status: Smoker; Output: Total Smoking Score: 7, Type: edge
20. Inputs:Sex: Female, Age: 49, Smoking Status: Nonsmoker; Output: Total Smoking Score: 0, Type: edge
21. Inputs:Sex: Male, HDL (mg/dL): 55; Output: HDL Score: 0; Type: typical
22. Inputs:Sex: Male, HDL (mg/dL): 49; Output: HDL Score: 1; Type: edge
23. Inputs:Sex: Female, HDL (mg/dL): 55; Output: HDL Score: 0; Type: typical
24. Inputs:Sex: Female, HDL (mg/dL): 49; Output: HDL Score: 1; Type: edge
25. Inputs:Sex: Male, Systolic BP (mmHg): 125, Treated: Yes; Output: Systolic BP Score: 1; Type: typical
26. Inputs:Sex: Male, Systolic BP (mmHg): 159, Treated: Yes; Output: Systolic BP Score: 2; Type: edge
27. Inputs:Sex: Male, Systolic BP (mmHg): 125, Treated: No; Output: Systolic BP Score: 0; Type: typical
28. Inputs:Sex: Male, Systolic BP (mmHg): 159, Treated: No; Output: Systolic BP Score: 1; Type: edge
29. Inputs:Sex: Female, Systolic BP (mmHg): 125, Treated: Yes; Output: Systolic BP Score: 3; Type: typical
30. Inputs:Sex: Female, Systolic BP (mmHg): 159, Treated: Yes; Output: Systolic BP Score: 5; Type: edge
31. Inputs:Sex: Female, Systolic BP (mmHg): 125, Treated: No; Output: Systolic BP Score: 1; Type: typical
32. Inputs:Sex: Female, Systolic BP (mmHg): 159, Treated: No; Output: Systolic BP Score: 3; Type: edge
33. Inputs:Sex: Male, Age: 42, Total Cholestrol: 250, Smoking Status: Nonsmoker, HDL (mg/dL): 55, Systolic BP (mmHg): 145, Treated: No; Output: 10-year risk: 3%, Type: typical
34. Inputs:Sex: Female, Age: 42, Total Cholestrol: 250, Smoking Status: Nonsmoker, HDL (mg/dL): 55, Systolic BP (mmHg): 145, Treated: No; Output: 10-year risk: 1%, Type: typical
35. Inputs:Sex: Male, Age: 34, Total Cholestrol: 280, Smoking Status: Nonsmoker, HDL (mg/dL): 59, Systolic BP (mmHg): 129, Treated: No; Output: 10-year risk: 1%, Type: edge
36. Inputs:Sex: Female, Age: 34, Total Cholestrol: 280, Smoking Status: Nonsmoker, HDL (mg/dL): 59, Systolic BP (mmHg): 129, Treated: No; Output: 10-year risk: <1%, Type: edge

37. Inputs:Sex: Male, Age: 42, Total Cholestrol: 150, Smoking Status: Nonsmoker, HDL (mg/dL): 55, Systolic BP (mmHg): 110, Treated: No; Output: 10-year risk: 1%, Type: typical
38. Inputs:Sex: Female, Age: 42, Total Cholestrol: 150, Smoking Status: Nonsmoker, HDL (mg/dL): 55, Systolic BP (mmHg): 110, Treated: No; Output: 10-year risk: <1%, Type: typical
39. Inputs:Sex: Male, Age: 77, Total Cholestrol: 150, Smoking Status: Smoker, HDL (mg/dL): 49, Systolic BP (mmHg): 135, Treated: Yes; Output: 10-year risk: ≥30%, Type: edge
40. Inputs:Sex: Female, Age: 77, Total Cholestrol: 150, Smoking Status: Smoker, HDL (mg/dL): 49, Systolic BP (mmHg): 135, Treated: Yes; Output: 10-year risk: 22%, Type: edge