

Activity 1: *Thinking about the program*

General Steps of the program:

- Variables: male or female, a person's age, their total cholesterol, if they smoke or not, their HDL cholesterol, their systolic blood pressure, the percentage of 10-year risk of heart attack
 - Variable names:
 - sex= male or female
 - age= person's age
 - t_chol = total cholesterol
 - smoker= if person smokes
 - HDL_chol = HDL cholesterol
 - TBP = treated systolic blood pressure
 - SBP = systolic blood pressure
 - points= points awarded based on variable inputs
 - t_points= total points awarded
 - risk= percentage of 10-year risk of heart attack
- User input variables except for risk
- Compute points based on variables with conditions
- Use "if" statement for sex
 - If Statement for age
 - Award points for age
 - Award point for total cholesterol
 - Award points for smoker
 - Award points for HDL
 - If systolic BP is treated
 - Award points for systolic BP
- Calculate a total of points awarded
- Calculate risk based on total points awarded

Test Cases:

- Typical Cases:
 - Male:
 - age= 22, point= -9, t_chol= 155, point= 0, smoker= false, point= 0, HDL= 65, point= -1, TBP = false, SBP= 115, point= 0, total= -10, risk= <1%
 - age= 53, t_chol= 165, smoker= false, HDL = 55, TBP = true, SBP = 125, t_total= 5, risk = 2%
 - age = 20, point = -9, t_chol = 240, point = 9, smoker = true, point = 8, HDL = 51, point = 0, sysBP = 132, treated = true, point = 2, total = 10, risk = 6%

- age = 39, point = -4, t_chol = 160, point = 4, smoker = false, point = 0, HDL = 40, point = 1, sysBP = 130, treated = false, point = 1, total = 2, risk = 1%
- age = 73, point = 12, t_chol = 230, point = 0, smoker = false, point = 0, HDL = 48, point = 1, sysBP = 128, treated = true, point = 1, total = 14, risk = 16%
- age = 44, point = 0, t_chol = 200, point = 5, smoker = true, point = 5, HDL = 60, point = -1, sysBP = 143, treated = true, point = 2, total = 11, risk = 8%
- age= 45, t_chol= 235, smoker= true, HDL = 45, TBP = true, SBP = 145, t_points = 16, risk = 25%
- age= 75, points = 13, t_chol = 201, point = 0, smoker= false, point = 0, HDL = 54, point= 0, sysBP= 135, treated= true, point= 2, total = 15, risk = 20%
- Female:
 - age= 22, point= -7, t_chol= 155, point= 0, smoker= false, point= 0, HDL= 65, point= -1, sysBP= 115, point= 0, total= -8, risk= <1%
 - age= 29, chol= 270, smoker = false, HDL = 45, sysBP= 130, treated= false, total = 4, risk = <1%
 - Age = 33, chol= 200, smoker= true, HDL = 38, sysBP= 140, treated= false, total= 15, risk= 3%
 - age= 37, chol=180, smoker= false, HDL = 50, sysBP= 130, treated= true, total = 6, risk= <1%
 - age= 43, chol= 205, smoker= true, HDL= 35, sysBP=145, treated= true, total= 20, risk= 11%
 - age= 46, chol= 212, smoker= false, HDL= 41, sysBP= 162, treated= false, total= 14, risk= 2%
 - age = 50, chol= 200, smoker= false, HDL= 46, sysBP= 157, treated = false, total= 14, risk= 2%
 - age = 57, chol= 248, smoker= true, HDL= 34, sysBP= 173, treated= false, total= 23, risk= 22%
- Edge Cases:
 - sex= male, age= 20, t_chol= 155, smoker= false, HDL= 65, TBP = false, SBP= 115, total= -10, risk= <1%
 - sex= female, age= 20, t_chol = 155, smoke= false, HDL = 65, TBP = false, SBP= 115, t_points = -8, risk = <1%
 - sex= female, age = 79, point = 16, t_chol = 281, point = 2, smoker = true, point = 1, HDL = 38, point = 2, sysBP = 162, treated = true, point = 6, total = 28, risk = >=30%
 - sex= male, age= 79, t_chol= 285, smoker= true, HDL = 35, TBP = true, SBP= 165, t_points = 21, risk = > 30%
 - sex= female, Edge, age = 77, chol= 300, smoker=false, HDL= 36, sysBP= 177, treated= true, total= 24, risk = 27%

- sex= female, Edge, age= 20, chol= 300, smoker= true, HDL = 51, sysBP= 158, treated= true, total= 18, risk= 6%
- sex= female, Edge, age = 21, chol= 140, smoker= false, HDL= 64, sysBP= 125, treated= false, total= -7, risk = <1%
- sex= male, age= 79, chol= 285, smoker= true, HDL= 27, sysBP= 189, treated= true, total= >30%
- Error catching:
- Everything is based on if the individual is male or female, and there are different risks associated with an age range of $20 \leq \text{age} \leq 79$, no data is available for ages outside of that range.
 - Sex != male, the program outputs "Invalid gender input"
 - Sex = male, age= <20, the program outputs "cannot compute risk"
 - Sex = female, age= <20, the program outputs "cannot compute risk"
 - Sex = female, age = >80, the program outputs "cannot compute risk"
 - Sex = male, age = >80, the program outputs "cannot compute risk"
- Intermediate Cases:
 - Sex: Male
 - age=21,point=-9
 - age=36, chol = 242,point=5
 - age=52,chol=170, smoker=false,point=8
 - age=23,chol=210,smoker=true,point=6
 - age = 58,chol=291,smoker=true,HDL=42,point=17
 - age=70,chol=110,smoker=false,HDL=10,sysBP=138,treated=true,point=14,risk=2%
 - age=34,chol=249,smoker=true,HDL=44,sysBP=170,treated=false,point=11,risk=1%
 - Female
 - age=21,point=-7
 - age=43,chol=170,point=3
 - age=52,chol=210,smoker=false,point=10
 - age=62,chol=250,smoker=true,HDL=41,point=17
 - age=72,cho=290,smoker=true,HDL=20,sysBP=132,treated=true,point=20,risk=11%