Zach North

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Project 2 Writeup

*Obstacles:* Some of the problems I encountered writing this program involved the tax brackets. There are many different ways to deal with the differing rates in different income brackets, but the fact that they change based on occupation in certain cases adds another layer of complexity. I initially tried an *if/else if/else* structure but it was proving to be very long and confusing, with lots of nested *if*s and temporary variables. A *while* structure proved effective but I then discovered the project spec disallowed using loops, so I switched once again to an *if/else if/else* structure but tried my best to simplify it. My new version was still a little confusing, and honestly I prefer using a *while* structure in this problem, but my final code was still adequate for solving the problem.

One other problem I had was with the tax breaks for additional children; to fix it, I chose to subtract the children tax breaks from the taxes owed first, making the value temporarily negative, and then adding on to it while doing the tax calculation functions. If the taxes owed variable ends up below zero, I inserted a bit of code making sure it would be reset to zero before being outputted to the user.

Test Inputs

(Zach North, 120000, student, 4) returned $6200.00. Proved to be valid after checking the website calculator.

(*blank string*, 200000, bartender, 2) returned “You must enter a name”. The correct behavior.

(Zach North, 2, *blank string*, 2) returned “You must enter an occupation”. Correct behavior.

(Zach North, 2, student, -2) returned “The number of children must be nonnegative”. Correct behavior.

(Zach North, -20000, student, 0) returned “The taxable income must be nonnegative”. Correct behavior.

(Zach North, 5, student, 4) returned $0.00. This is the correct value and notable because it did not display a negative tax value.

(Zach North, 2000000, engineer, 2) returned $174700.00. This is correct according to the online calculator, meaning the program handles the “engineer” occupation correctly.

(Zach North, 2000000, scientist, 2) returned $174700.00. This means the program handles the “scientist” occupation correctly.

(Zach North, 2000000, student, 2) returned $175400.00. This is correct according to the online calculator, meaning the program handles other occupations correctly.

(Zach North, 20000.73, student, 0) returned $800.03. This is correct according to the online calculator and indicates the decimals are handled correctly by the program.

(Zach North, 2795638.92, engineer, 2) returned $246307.50. This very complicated input was correct according to the online calculator.

(Zach North, 110928.29, scientist, 2) returned $4646.41. This was correct according to the online calculator.

(Zach North, 110928.29, bartender, 4) returned $4855.70. Correct according to online calc.

(Zach North, 20000.39, bartender, 6) returned $0. Correct.

At this point, I had tested all income brackets, error messages, occupations, and various numbers of children, and the program had responded correctly to all input so far. I come to the conclusion that the program is complete.