

## Structures and features

### Loops

I have three loops within my program, two for loops and one while loop. The first for loop has the purpose of initialising my arrays and setting all values within them to 0 or a null character through \0. The second for loop is used at the end of the program to echo the arrays back to the user in the form of a final quote with a total. The while loop will serve as a capsule for the state machine to ensure that it keeps running until the final state is reached.

### Conditional Statements

#### Switch and Case

I have two switch and case statements. The first of which is used to handle the type of pet during the calculation stage of the program where the cost of each animal is calculated along with the insurance modifiers. The other switch and case statement is used as the main control within the state machine.

#### If/Else

If, else and if else statements are used throughout the program to choose between two or more options where a case statement would not be as necessary or needed at all. The main use for this is checking if the user has entered a question mark rather than the correct input, as the user requirements state that the program needs to allow the user to use a question mark at any point to get help. The primary difference is that if statements can calculate comparisons, rather than being pre-set.

The program uses if statements within case statements where multiple checks are required. Somewhere I have needed to use this is when checking if the entered animal is a young male. The program uses a case statement to check whether or not the animal is male, and then an if/else statement within to check if the animal is younger than 2 years of age.

#### Validation

The program also needed if/else statements for input validation. If a user enters an invalid input, or something that doesn't make complete sense in the context, the program is able to recognise this and have the user re-enter the input.

### Finite-State Machine

The core of the program is controlled by a finite-state machine that has 11 states. Those states are listed in the pseudocode in the planning document, as well as within the actual programs code. The "Check Continue" state has two outcomes. If the user decides to add another animal, it will switch back to the third state, "Load Animal Name". If they do not, it will continue to the "Print Result" state.