

Part 6: Exercising Loops

Exercise Instructions

Ok, so this exercise might take a bit of thought power as it can be a bit of a leap to go from just repeating statements in the code, to using them in a loop.

What you have to do is replace the multiple expressions we had before to calculate the total amount payable at the end of each year:

```
double year1AmountDue = amount * interestRateMultiplier;
double year2AmountDue = year1AmountDue * interestRateMultiplier;
double year3AmountDue = year2AmountDue * interestRateMultiplier;
double year4AmountDue = year3AmountDue * interestRateMultiplier;
double year5AmountDue = year4AmountDue * interestRateMultiplier;
```

Replace these completely by a loop which will do the work for us.

This might seem very difficult to do, but just take a step back and analyse the data to help you. For example, here are some things I notice about the data:

- every expression involves multiplying a value with `interestRateMultiplier`
- we start with the `amount` value, calculate a new value and seem to keep updating the value to create a new value each time (i.e. we overwrite the current value with the new value).
- we do this for the total amount of `years`

We could phrase this in psuedocode like this:

```
while the current year is less than the year being calculated
    take the current amount repayable and scale it up by the interest amount,
    then write that value back to be the new current amount
    increase the current year by 1 (so we calculate the next year on the next loop iteration)
```

You'll need to set up the variables beforehand, but hopefully you can translate this into a `while` loop to calculate the total repayment due.

If you can't do it, don't worry - we have the solution for you. But try to get your head round it as it will really help you understand the mechanics of loops if you can nail it.

The exercise is then:

- Replace the expression statements above with a `while` loop and associated variables which will

calculate a `currentAmountPayable` value. *(On each iteration of the loop, this will increase and represent the amount payable at the current year being calculated; when the loop has completed, this will hold the final total amount repayable for whole period of the loan.)*

- Plug this output value into the program to ensure that the output is the same as it was before.

Step 2: Run the Project

- Run the project and ensure that the output of the program is the same as it was in the last step.