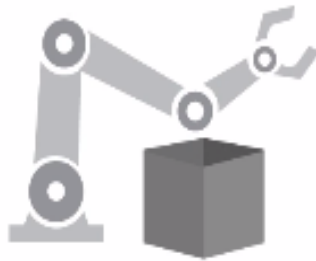


Writing a While Loop

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Often we do not know exactly how many times we need to do something just that we need to stop doing it at some point when a goal or condition is met.

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For example once we have made a deposit into an interest-bearing account how many times must the interest be compounded before we meet a financial goal, to answer this question we'll use a while loop.

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MATLAB Commands
<pre>r = 0.02; balance = 20000; count = 0; balance = (1+r)*balance; count = count+1; balance = (1+r)*balance; count = count+1; balance = (1+r)*balance; count = count+1; balance = (1+r)*balance; count = count+1; balance = (1+r)*balance; count = count+1; balance = (1+r)*balance;</pre>

First we will create a variable for the interest rate and one for the account balance which has an initial value of twenty thousand dollars we will also create the variable count to keep track of how many times we have compounded the interest so far, we can update the values of balance and count after each compounding period by using the two commands shown, unfortunately we will have to enter these commands repeatedly and check each time to see if our savings goal has been met.

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MATLAB Commands
<pre>r = 0.02; balance = 20000; count = 0; while balance < 25000 balance = (1+r)*balance; count = count+1; end</pre>

However by placing the commands inside of a while loop.

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While-Loop

```
while balance < 25000
    balance = (1+r)*balance;
    count = count+1;
end
```

The commands will be automatically executed again and again until our savings goal is satisfied.

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Loop Keywords

```
while balance < 25000  
    balance = (1+r)*balance;  
    count = count+1;  
end
```

A while loop is denoted by the loop keywords while and end which specify the start and end of the loop.

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Loop Condition

```
while balance < 25000  
    balance = (1+r)*balance;  
    count = count+1;  
end
```

The while keyword is followed by an expression called the loop condition.

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Loop Condition

```
while balance < 25000 {  
  true  
  false
```

The loop condition should evaluate to either true or false.

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Loop Body

```
while balance < 25000  
    balance = (1+r)*balance;  
    count = count+1;  
end
```

The remaining commands are called the loop body.

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```
while balance < 25000 true
    balance = (1+r)*balance;
    count = count+1;
end
```

 balance	20000
 count	0

When we first execute this while loop our initial balance is less than 25,000 so the loop condition evaluates to true and we enter the loop body.

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```
while balance < 25000
    balance = (1+r)*balance;
    count = count+1;
end
```



balance	20400
count	0



The commands in the loop body are then executed and the values of our variables are updated as a result.

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```
while balance < 25000
    balance = (1+r)*balance;
    count = count+1;
end
```

 balance	20400
 count	1

After the final command and the loop body is executed the loop condition is evaluated once again since the new balance is still less than 25,000.

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```
while balance < 25000 false
    balance = (1+r)*balance;
    count = count+1;
end
```

	balance	25365
	count	12

We re-enter the loop body execute the commands and update our variable values once more, this process is repeated as long as the loop condition evaluates to true, in this case the balance surpasses 25,000 after the 12th iteration of the while loop now the loop condition evaluates to false which terminates the wild loop.

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```
MATLAB Commands
r = 0.02;
balance = 20000;
count = 0;
while balance < 25000
    balance = (1+r)*balance;
    count = count+1;
end
```

```
balance 25365
count 12
```

The statements inside the loop body are not executed and the variable values are left unchanged and just like that we are done well not with the saving part.

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