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In Class Exercise on loops and if statements:
These are unrealistic problems, but they help to make sure that you understand the flow of logic and can follow it through to completion.

Problems #1:

```
start
  firstNum = 100
  secondNum = 5
  thirdNum = 12
  the Result = 0
  do while secondNum <= thirdNum
    if firstNum > 500
      firstNum = firstNum * 2
      secondNum = secondNum + 1
    else
      firstNum = firstNum + 100
      thirdNum = thirdNum - 1
    end if
  end while loop
  theResult = firstNum + secondNum + thirdNum
  display theResult
end
```

Problem #2:

```
start
  firstNum = 25
  secondNum = 50
  thirdNum = 75
  fourthNum = 100
  ct = 0
  workAns = 0
  theAns = 0
  do while ct < 6
    workAns = firstNum + secondNum
    if workAns > thirdNum
      fourthNum = fourthNum / 2
      firstNum = firstNum * 3
      secondNum = firstNum - secondNum
      thirdNum = thirdNum * 2
    else
      firstNum = firstNum + 10
      secondNum = secondNum + 10
      thirdNum = thirdNum + 10
    end if
    ct = ct + 1
  end do
  theAns = firstNum + secondNum * thirdNum + fourthNum
  display theAns
end
```

Programming language!

To be classified as a programming language, the language must include
sequence
selection
iteration

- Sequence
- Selection decisions
- loop iteration

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  else
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    thirdNum = thirdNum - 1
  end if
end while loop
theResult = firstNum + secondNum + thirdNum
display theResult
end
```

Problem #2:

```
start
firstNum = 25
secondNum = 50
thirdNum = 75
fourthNum = 100
ct = 0
workAns = 0
theAns = 0
do while ct < 6
  workAns = firstNum + secondNum
  if workAns > thirdNum
    fourthNum = fourthNum / 2
    firstNum = firstNum * 3
    secondNum = firstNum - secondNum
    thirdNum = thirdNum * 2
  else
    firstNum = firstNum + 10
    secondNum = secondNum + 10
    thirdNum = thirdNum + 10
  end if
  ct = ct + 1
end do
theAns = firstNum + secondNum * thirdNum + fourthNum
display theAns
end
```

3 parts

- housekeeping
- processing
- wrapup

One time things done when the program starts

One time things done when the program is about to end.

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Problems #1:

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the Result = 0
do while secondNum <= thirdNum
  if firstNum > 500
    firstNum = firstNum * 2
    secondNum = secondNum + 1
  else
    firstNum = firstNum + 100
    thirdNum = thirdNum - 1
  end if
end while loop
theResult = firstNum + secondNum + thirdNum
display theResult
end
  
```

Handwritten notes for Problem #1:
 - "initializing" written above the firstNum, secondNum, thirdNum, and the Result lines.
 - A blue arrow points from the word "initializing" down to the initialization lines.
 - A blue arrow points from the word "initializing" up to the firstNum = 100 line.
 - A blue arrow points from the word "initializing" down to the firstNum = firstNum + 100 line.

<u>first Num</u>	<u>second Num</u>	<u>third Num</u>	<u>the Result</u>
100	5	12	0
200	6	11	4815
300	7	10	
400	8	9	
500		8	
600		7	
1200			
2400			
4800			

Problem #2:

```

start
firstNum = 25
secondNum = 50
thirdNum = 75
fourthNum = 100
ct = 0
workAns = 0
theAns = 0
do while ct < 6
  workAns = firstNum + secondNum
  if workAns > thirdNum
    fourthNum = fourthNum / 2
    firstNum = firstNum * 3
    secondNum = firstNum - secondNum
    thirdNum = thirdNum * 2
  else
    firstNum = firstNum + 10
    secondNum = secondNum + 10
    thirdNum = thirdNum + 10
  end if
  ct = ct + 1
end do
theAns = firstNum + secondNum * thirdNum + fourthNum
display theAns
end
  
```

Handwritten notes for Problem #2:
 - The final result "4815" is circled in blue.

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Problems #1:

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    if firstNum > 500
      firstNum = firstNum * 2
      secondNum = secondNum + 1
    else
      firstNum = firstNum + 100
      thirdNum = thirdNum - 1
    end if
  end while loop
  theResult = firstNum + secondNum + thirdNum
  display theResult
end

```

Handwritten notes for Problem #1:

firstNum	secondNum	thirdNum	fourth Num
25	50	75	100
35	60	85	

loop 3 times

Problem #2:

```

start
  firstNum = 25
  secondNum = 50
  thirdNum = 75
  fourthNum = 100
  ct = 0
  workAns = 0
  theAns = 0
  do while ct < 6
    workAns = firstNum + secondNum
    if workAns > thirdNum
      fourthNum = fourthNum / 2
      firstNum = firstNum * 3
      secondNum = firstNum - secondNum
      thirdNum = thirdNum * 2
    else
      firstNum = firstNum + 10
      secondNum = secondNum + 10
      thirdNum = thirdNum + 10
    end if
    ct = ct + 1
  end do
  theAns = firstNum + secondNum * thirdNum + fourthNum
  display theAns
end

```

Handwritten notes for Problem #2:

ct	workAns	theAns
0	75	0
2	95	

- set ct
 - test ct
 - change ct

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Problems #1:

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  do while secondNum <= thirdNum
    if firstNum > 500
      firstNum = firstNum * 2
      secondNum = secondNum + 1
    else
      firstNum = firstNum + 100
      thirdNum = thirdNum - 1
    end if
  end while loop
  theResult = firstNum + secondNum + thirdNum
  display theResult
end
  
```

firstNum secondNum thirdNum fourthNum

25	125	50	75	200	100
35	405	60	85	400	50
105		45	330	170	25
115		55	180		
125		65	190		

Problem #2:

```

start
  firstNum = 25
  secondNum = 50
  thirdNum = 75
  fourthNum = 100
  ct = 0
  workAns = 0
  theAns = 0
  do while ct < 6
    workAns = firstNum + secondNum
    if workAns > thirdNum
      fourthNum = fourthNum / 2
      firstNum = firstNum * 3
      secondNum = firstNum - secondNum
      thirdNum = thirdNum * 2
    else
      firstNum = firstNum + 10
      secondNum = secondNum + 10
      thirdNum = thirdNum + 10
    end if
    ct = ct + 1
  end do
  theAns = firstNum + secondNum * thirdNum + fourthNum
  display theAns
end
  
```

ct workAns theAns

0	0	0
75	75	
95	95	
150	150	
170	170	
190	190	
210	210	

330
400

130000
405
25

132430

FILE TOOLS VIEW ifexampleS10.doc [Read-Only] [Compatibility Mode] - Word

Practice exercise:

Payroll file: (each record is payRecord)

idno	name	payHr	regHrs	ovtHrs
1111	John Doe	20	40	10
1234	Ann Costa	25	40	0
2222	Linda Ryan	30	40	20
2345	Bob Smith	30	35	10
EOF				

```
start
  read payRecord
  do while not endOfFile
    if ovtHrs > 0
      regPay = payHr * regHrs
      ovtPay = payHr * ovtHrs * 1.5
      totPay = regPay + ovtPay
    else
      totPay = payHr * regHrs
    end if
    display totPay
    read payRecord
  end do while loop
stop program
```

End of document ■

*Initializing read
Priming read*

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FILE TOOLS VIEW ifexampleS10.doc [Read-Only] [Compatibility Mode] - Word

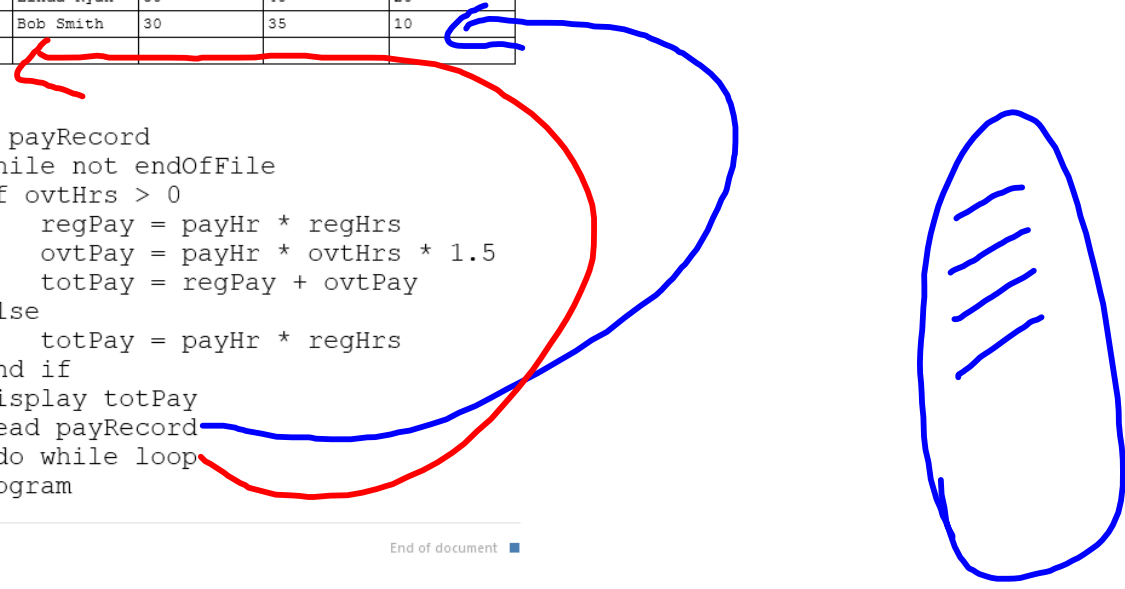
Practice exercise:

Payroll file: (each record is payRecord)

idno	name	payHr	regHrs	ovtHrs
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2345	Bob Smith	30	35	10
EOF				

```
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  do while not endOfFile
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      totPay = regPay + ovtPay
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      totPay = payHr * regHrs
    end if
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    read payRecord
  end do while loop
stop program
```

End of document ■



Practice exercise:

Payroll file: (each record is payRecord)

idno	name	payHr	regHrs	ovtHrs
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```

start
  read payRecord
  do while not endOfFile
    if ovtHrs > 0
      regPay = payHr * regHrs
      ovtPay = payHr * ovtHrs * 1.5
      totPay = regPay + ovtPay
    else
      totPay = payHr * regHrs
    end if
    display totPay
    read payRecord
  end do while loop
stop program

```

initializing read
priming read

$$\begin{array}{r}
 \text{regPay} \\
 \hline
 800
 \end{array}
 \qquad
 \begin{array}{r}
 \text{ovtPay} \\
 \hline
 300
 \end{array}
 \qquad
 \begin{array}{r}
 \text{totPay} \\
 \hline
 1100 \\
 1000
 \end{array}$$

1100
1000
—
—

End of document ■

FILE TOOLS VIEW alogicasgnF12.doc [Read-Only] [Compatibility Mode] - Word

```

else
    var1 = var1 - 1
    var2 = var2 + 3
end if
return

```

```

display toOrder
read invenRecord
end do while loop
stop program

```

```

start
amt1 = 1
amt2 = 2
ans = 0
do while amt2 < 15
    if amt1 > 10
        amt1 = amt1 + 1
        amt2 = amt2 + 1
    else
        amt1 = amt1 + 5
        amt2 = amt2 + 5
    end if
end while loop
ans = amt1 + amt2
display ans
end

```

Problem #6: When the pseudocode displays ans, what number will ans be?

6. ans = 31
7. ans = 29
8. ans = 23
9. ans = 27
10. ans = 30

Inventory File where each record is invenRecord:

itemNo	onHand	onOrder	reOrdPt
11111	20	40	50
22222	20	30	50
33333	25	15	50
44444	10	50	75
55555	20	0	40

Problem #8: Show the output that would be generated if this pseudocode was executed using the data shown. Note that I want to see the output from each of the records you process.

Inventory File where each record is invenRecord:

itemNo	onHand	onOrder	reOrdPt
11111	20	40	50
22222	20	30	50
33333	25	15	50
44444	10	50	75
55555	20	0	40

Problem #7: Show the output that would be generated if this pseudocode was executed using the data shown. Note that I want to see the output from each of the records you process.

```

start
read invenRecord
do while not endOfFile
    calcToOrder()
    display toOrder
    read invenRecord
end do while loop
stop program

calcToOrder()
    totInven = onHand + onOrder
    if totInven > reOrdPt
        toOrder = 0
    else
        toOrder = (reOrdPt - (onHand + onOrder)) * 1.5
    end if
return

```

```

start
read invenRecord
do while not endOfFile
    totInven = onHand + onOrder
    if totInven > reOrdPt
        toOrder = 0
    else
        toOrder = (reOrdPt - (onHand + onOrder)) + 100
    end if
end while loop

```

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