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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
```

Handwritten notes:

- 3 parts
- ① housekeeping  
- I time things
- ② processing
- ③ wrapup
- Programming language
- sequence
- selection decisions
- loops iteration

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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 how to loop and how to use if statements to completion.

Problems #1:

```

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secondNum = 5
thirdNum = 12
theResult = 0
do while secondNum <= thirdNum
  if firstNum > 500
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theResult = firstNum + secondNum + thirdNum
display theResult
end

```

Problem #2:

```

start
firstNum = 25
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fourthNum = 100
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theAns = 0
do while ct < 6
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  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

```

To be classified as a programming language, the language must include

- sequence
- selection
- iteration

3 parts

- ① housekeeping  
1 time things done once before processing starts
- ② processing
- ③ wrapup  
1 time things before just before the program ends

Programming language

- sequence
- selection decisions
- loops iteration

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

← initialize

	firstNum	secondNum	thirdNum	theResult
	100	5	12	0
if ( ) loop	200	6	11	4815
	300	7	10	
	400	8	9	
	500		8	
	600		7	
	1000			
	2400			
	4800			

Problem #2:

```

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firstNum = 25
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thirdNum = 75
fourthNum = 100
ct = 0
workAns = 0
theAns = 0
do while ct < 6
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  if workAns > thirdNum
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    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
  
```

	firstNum	secondNum	thirdNum	fourthNum	workAns	theAns
	25	50	75	100	75	0
	75	100	150	50	225	0
	225	110	300	25	335	0
	675	120	600	12.5	795	0
	2025	130	1200	6.25	2155	0
	6075	140	2400	3.125	4800	0
	18225	150	4800	1.5625	4815	4815

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```
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      firstNum = firstNum * 3
      secondNum = firstNum - secondNum
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    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
```

loop  
- set ct  
- test ct  
- change ct

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    else
      firstNum = firstNum + 100
      thirdNum = thirdNum - 1
    end if
  end while loop
  theResult = firstNum + secondNum + thirdNum
  display theResult
end
  
```

Handwritten notes for Problem #1:

<u>firstNum</u>	<u>secondNum</u>	<u>thirdNum</u>	<u>fourthNum</u>
<del>25</del>	50	75	
<del>35</del>	60	85	102
105	45	170	50
115	55	180	25
125	65	190	
135	75	200	
405		400	

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: 0, 1, 2, 3, 4, 5, 6

workspace: 0, 95, 95, 150, 140, 100, 100

theAns: 132430

Final calculation: 300, 400, 132000, 25, 430

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
```

initializing read  
priming read

regPay 800  
outPay 300  
totPay 1100

1100  
1000  
---  
100

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
```

initializing read  
priming read

regPay  $\frac{\quad}{800}$     ovtPay  $\frac{\quad}{300}$     totPay  $\frac{1100}{1000}$

1100  
1000  
—  
—

```

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	reOrderPt
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.

```

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

```

Inventory File where each record is invenRecord:

itemNo	onHand	onOrder	reOrderPt
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
    totInven = onHand + onOrder
    if totInven > reOrdPt
        toOrder = 0
    else
        toOrder = (reOrdPt - (onHand + onOrder)) + 100
    end if
end while loop

```