

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
theResult = 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 Annotations:

- Variables:** Green arrow pointing to the variable declarations in the code.
- while:** Red arrow pointing to the `do while` loop.
- until:** Red text next to the `do while` loop.
- Pseudocode:** Green text on the right side.
- Flowchart:** A green flowchart showing a decision diamond labeled "decision". The "N" (No) path goes to the left and is labeled "else". The "Y" (Yes) path goes to the right and loops back to the start of the loop. The loop ends at a circle labeled "endif".
- Loop Steps:** Red text on the right: "loop", "1) establish Control", "2) test", "3) change".

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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
```

Handwritten Annotations (Red Ink):

<u>firstNum</u>	<u>secondNum</u>	<u>thirdNum</u>	<u>theResult</u>
100	5	12	0
200	6	11	4815
300	7	10	
400	8	9	
500		8	
600		7	
1200		7	
2400			
4800			

The final result **4815** is circled in red.

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start

www.pgrocer.net/Cis17/inclass/loopifplay.html

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```

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  else
    firstNum = firstNum + 10
    secondNum = secondNum + 10
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  end if
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end do
theAns = firstNum + secondNum * thirdNum + fourthNum
display theAns
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```

Handwritten notes:

<u>firstNum</u>	<u>secondNum</u>	<u>thirdNum</u>	<u>theResult</u>
100	5	12	0
200	6	11	4815
300	7	10	
400	8	9	
500		8	
600		7	
1200		7	
2400			
4800			

memory variables & initial values

4815

Problem #1:

```

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  if firstNum > 500
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    firstNum = firstNum + 100
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  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
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do while ct < 6
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  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 Annotations:

firstNum secondNum thirdNum fourthNum

25	135	50	75	25	200	100
35	405	60	330	85	400	50
165	45	45	170	180		25
145	55	190				
125	65	190				

ct workAns theAns

0 0 0

x 75 132430

x 95 150

x 150 170

x 170 190

x 190 210

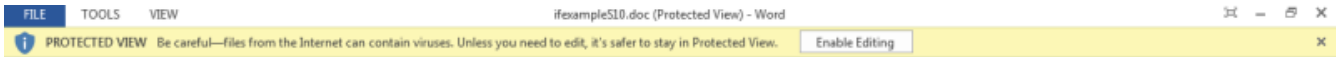
132430

330
x 406

132060
 405

 132465
+ 25

132490



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

<u>regPay</u>	<u>ovtPay</u>	<u>totPay</u>
800	300	1100
1200	900	1000
1050	450	2100
		1500

- 1100
- 1000
- 2100
- 1500

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PROTECTED VIEW Be careful—files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View. Enable Editing

Logic Assignment

I want you to play computer. Step through these problems and determine the result.

Note the differences between WHILE and UNTIL in the condition.

<pre> start var1 = 10 var2 = 20 wksum = 0 rslt = 0 do while var2 < 30 wksum = var1 + var2 if wksum > 30 var1 = var1 - 2 var2 = var2 + 1 else var1 = var1 - 1 var2 = var2 + 3 end if end while loop rslt = var1 + var2 display rslt end </pre>	<p>Problem #1: When the pseudocode displays rslt, what number will rslt be?</p> <ol style="list-style-type: none"> 1. rslt = 28 2. rslt = 29 3. rslt = 30 4. rslt = 31 5. rslt = 32
<pre> start var1 = 10 var2 = 20 wksum = 0 rslt = 0 do until var2 > 30 wksum = var1 + var2 if wksum > 30 var1 = var1 - 2 var2 = var2 + 1 else var1 = var1 - 1 var2 = var2 + 3 end if end until loop rslt = var1 + var2 display rslt end </pre>	<p>Problem #2: When the pseudocode displays rslt, what number will rslt be?</p> <ol style="list-style-type: none"> 1. rslt = 28 2. rslt = 29 3. rslt = 30 4. rslt = 31 5. rslt = 32

30 ends

31 end or over

PAGE 1 OF 6

100%