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www.pgrocer.net/Cis17/inclass/loop/play.html

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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.

Pseudocode

Problems #1:

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

memory variables

loop
1) Set
2) test
3) change

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
```

else code

below if code

endif

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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
```

Problems #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
```

First Num	Second Num	Third Num	theResult
100	5	12	0
200	6	11	4815
300	7	10	
400	8	9	
500		8	
600		7	
1200			
2400			
4800			

Handwritten notes: A red arrow points from the 'do while' loop condition to the 'end while' statement. Another red arrow points from the 'do while' loop condition to the 'theResult' calculation. The value '4815' is circled in red.

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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 notes for Problem #1:

<u>firstNum</u>	<u>secondNum</u>	<u>thirdNum</u>	<u>fourthNum</u>
25	135	50	75
35	405	60	200
165	405	45	400
115	55	170	25
125	65	180	
		190	

Handwritten notes for Problem #2:

<u>ct</u>	<u>workAns</u>	<u>theAns</u>	
0	75	210	330
1	95	150	406
2	150	190	132000
3	190	190	405
4	190	190	25
5	190	190	132430

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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
```

Handwritten notes and calculations:

Initializing read (with arrow pointing to `read payRecord`)

regPay	ovtPay	totPay
800	300	1100
1200	900	1000
1650	650	2100
		1500

Summary of totPay values:

- 1100
- 1000
- 2100
- 1500

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Logic Assignment

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

<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

loop
end
Var2 reaches
30

Until
Var2 is 31 or
more

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<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 = 282. rslt = 293. rslt = 304. rslt = 315. rslt = 32

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