

**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
    
```

*variables assignment Sign housekeeping initialize*

<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	9	8	
600	10	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
    
```

Programming Language

*Sequence  
repetition loops  
Conditions if*



start

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display theResult
end
  
```

*Handwritten notes for Problem #1:*  
 variables  
 assignment  
 Sign  
 housekeeping  
 initialize

<u>firstNum</u>	<u>secondNum</u>	<u>thirdNum</u>	<u>theResult</u>
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theAns = firstNum + secondNum * thirdNum + fourthNum
display theAns
end
  
```

*Handwritten notes for Problem #2:*  
 Programming Language  
 Sequence  
 repetition loops  
 conditions if

*Flowchart:*  
 A diamond-shaped decision box labeled "que" with an "N" (No) path on the left and a "Y" (Yes) path on the right.

**Answer to Problem #2**  
 132430

start

```

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end do
theAns = firstNum + secondNum * thirdNum + fourthNum
display theAns
end

```

*Handwritten notes:*

first Num      second Num      third Num      fourth Num  
 25      50      75      100  
 35      60      85      50  
 165      45      170      25  
 115      55      180  
 185      65      190  
 135      75      200  
 405      330      400

330  
 x 400  
 -----  
 132000  
 405  
 25  
 -----  
 132430

ct  
 0  
 1  
 2  
 3  
 4  
 5  
 6

workans  
 0  
 75  
 95  
 150  
 170  
 190  
 210

the Ans  
 0

*Red arrows and circles highlight the loop logic and the final calculation in the code.*

start

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display theAns
end
```

Handwritten notes:

- Flowchart: `else` → `For F` (diamond) → `ques` (diamond) → `For T`
- Do while loop
- 1) set variables
- 2) check variable condition - do loop or do not loop
- 3) change variable

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    thirdNum = thirdNum + 10
  end if
  ct = ct + 1
end do
theAns = firstNum + secondNum * thirdNum + fourthNum
display theAns
end
```

Handwritten annotations in green ink:

- "Initializing housekeeping" with a bracket pointing to the initialization lines of Problem #1.
- "Processing" with a bracket pointing to the loop body of Problem #1.
- "Wrapup" with a bracket pointing to the final calculation and display lines of Problem #1.

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