Program 9

► **Design, develop, code and run the program in any suitable language to solve the commission problem.**

► **Analyze it from the perspective of dataflow testing, derive different test cases, execute these test cases and discuss the test results.**

► **Assumption price for lock = 45.0, stock= 30.0 and barrels = 25.0**

► **Production limit could sell in a month 70 locks, 80 stocks and 90 barrels**

► **Commission on sales = 10 % <= 1000 and 15 % on 1000 to 1800 and 20 % on above 1800*/**

*

Required Knowledge

- Locks
- Stocks
- Barrels

- Total locks –tlocks -0
- Total Stocks – tstocks-0
- Total Barrels – bbarrels-0

- Locks price - lprice
- Stocks price – sprice
- Barrels price- bprice

- Locks sales – lsales
- Stocks sales – ssales
- Barrels sales - Bsales

- Total sales – sales
- Final commission - comm

*

- Locks price - lprice = 45

- Stocks price – sprice =30

- Barrels price- bprice=25

- Tlocks= tlocks+locks

- Tstocks=tstocks+stocks

- Tbarrels=tbarrels+barrels

- Locks sales – lsales = lprice*tlocks

- Stocks sales – ssales = ssales*tstocks

- Barrels sales – Bsales = bsales*bstocks

*

- Sales = lsales+ssales+bsales

- Commision:

  - Sales is <=1000   = 10%

  - Sales is >1000 to <=1800 = 15%

  - Sales is > 1800   = 20%

  - 5400 – 1800 = 3600 -20% = 460

- 5400

  - 100

  - 120

  - 720

Very Important Calculation

If (sales>1800)


```
{
comm=0.10*1000.0;

comm=comm+0.15*800;
comm=comm+0.20*(sales-1800.0);
}
```

Program flow

Program Segment

```
1.  Program Commission (INPUT,OUTPUT)
2.  Dim locks, stocks, barrels As Integer
3.  Dim lockPrice, stockPrice, barrelPrice As Real
4.  Dim totalLocks, totalStocks, totalBarrels As Integer
5.  Dim lockSales, stockSales, barrelSales As Real
6.  Dim sales, commission As Real
7.  lockPrice = 45.0
8.  stockPrice = 30.0
9.  barrelPrice = 25.0
10. totalLocks = 0
11. totalStocks = 0
12. totalBarrels = 0
13. Input(locks)
14. While NOT(locks = -1)
15.    Input(stocks, barrels)
16.    totalLocks = totalLocks + locks
17.    totalStocks = totalStocks + stocks
18.    totalBarrels = totalBarrels + barrels
19.    Input(locks)
20. EndWhile
21. Output("Locks sold: ", totalLocks)
22. Output("Stocks sold: ", totalStocks)
23. Output("Barrels sold: ", totalBarrels)
```

Program Segment

```
23.  Output("Barrels sold: ", totalBarrels)
24. lockSales = lockPrice * totalLocks
25. stockSales = stockPrice * totalStocks
26. barrelSales = barrelPrice * totalBarrels
27. sales = lockSales + stockSales + barrelSales
28.  Output("Total sales: ", sales) 29. If (sales > 1800.0)
•    30.     Then
•    31.        commission = 0.10 * 1000.0
32.    commission = commission + 0.15 * 800.0
33.    commission = commission + 0.20 *(sales-1800.0)
34.  Else If (sales > 1000.0)
35.           Then
•    36.         commission = 0.10 * 1000.0
37.            commission = commission + 0.15 *(sales-1000.0)
38.         Else
39.            commission = 0.10 * sales
40.        EndIf
41.  EndIf
42. Output("Commission is $", commission)
43. End Commission
```

Program Graph
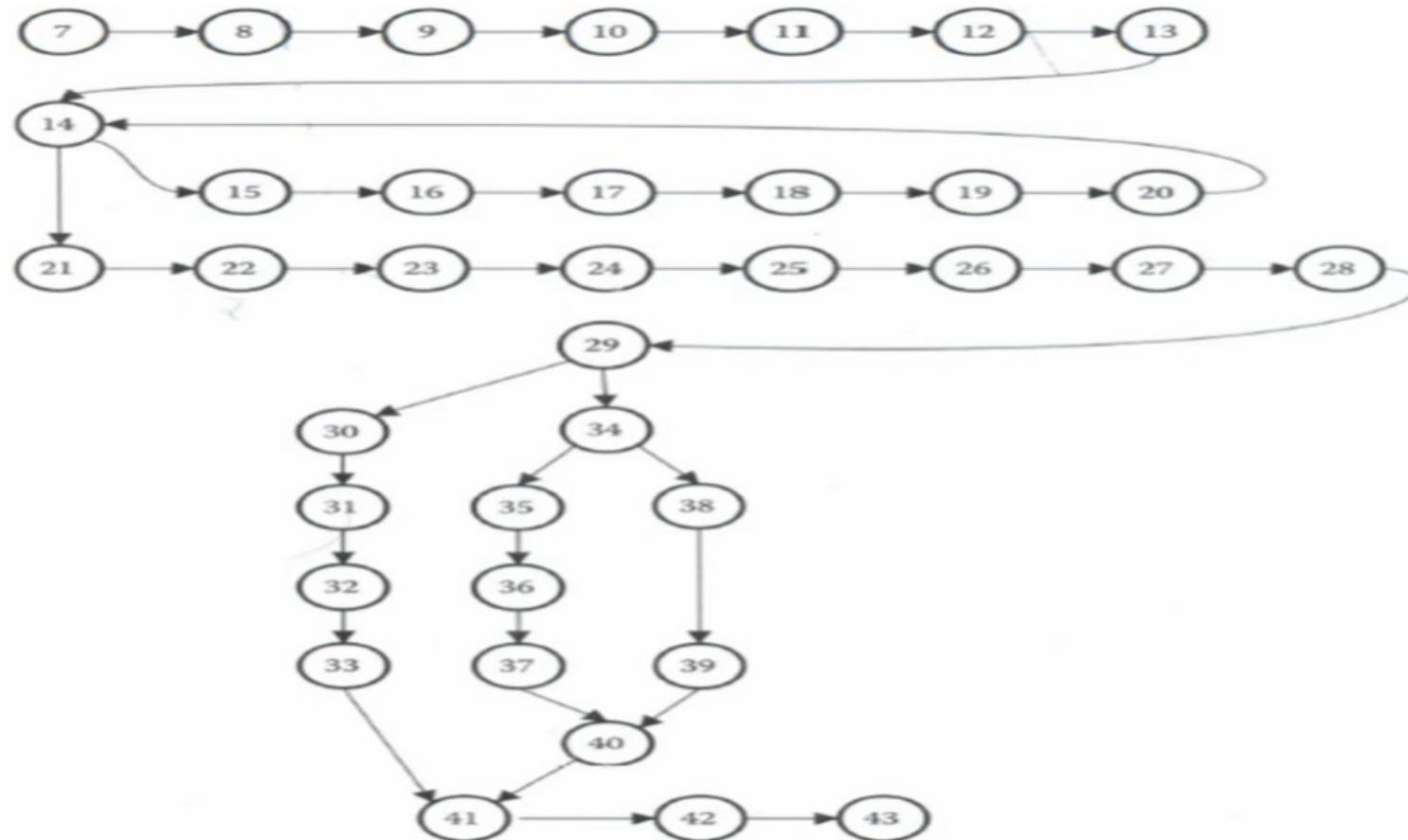
Variables in Commission Problem

Variable Name	Defined at Node	Used at node
lprice	7	24
sprice	8	25
bprice	9	26
tlocks	10,16	16,21,24
tstocks	11,17	17,22,25
tbarrels	12,18	18,23,26
locks	13,19	14,16
stocks	15	17
barrels	15	18
lsales	24	27
ssales	25	27
bsales	26	27
sales	27	28,29,33,34,37,39
comm	31,32,33,36,37,39	32,33,37,42

DU paths for commission problem

Test case id	Description	Variables Path (Beginning, End nodes)	Du Paths	Definition clear?	Comments
1	Check for lock price variable DEF(lprice,7) and USE(lprice,24)	(7 , 24)	<7-8-9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24>	Yes	
2	Check for Stock price variable DEF(sprice,8) and USE(sprice,25)	(8 , 25)	<8-9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25>	Yes	
3	Check for barrel price variable DEF(bprice,9) and USE(bprice,26)	(9 , 26)	<9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26>	Yes	
4	Check for total locks variable DEF((tlocks,10) and DEF(tlocks,16)) and 3 usage node(USE(tlocks,16),USE(tlocks,21), USE(tlocks,2 4)	(10 , 16)	<10-11-12-13-14-15-16>	Yes	
		(10 , 21)	<10-11-12-13-14-15-16-17-18-19-20-14-21>	No	
		(10 , 24)	<10-11-12-13-14-15-16-17-18-19-20-14-21-22-23-24>	No	
		(16 , 16)	<16-16>	Yes	
		(16 , 21)	<16-17-18-19-14-21>	No	
		(16 , 24)	<16-17-18-19-20-14-21-22-23-24>	No	

DU paths for commission problem

Test case id	Description	Variables Path (Beginning, End nodes)	Du Paths	Definition clear?	Comments
5	Check for total stocks variable DEF((tstocks,11) and DEF(tstocks,17)) and 3 usage node(USE(tstocks,17),USE(tstocks,22),USE(tstoc ks,25)	(11 , 17)	<11-12-13-14-15-16-17>	Yes	
		(11 , 22)	<11-12-13-14-15-16-17-18-19-20-21-14-21>	No	
		(11, 25)	<11-12-13-14-15-16-17-18-19-20-21-14-21-23-24-25>	No	
		(17 , 17)	<17-17>	Yes	
		(17 , 22) (17, 25)	<17-18-19-20-14-21-22>	No NO	
6	check for locks variable (DEF(locks,13), DEF(locks,19) and USE(locks,14),USE(locks,16)	(13 , 14)	<13-14>	Yes	
		(13 , 16)	<13-14-15-16>	Yes	
		(19 , 14)	<19-20-14>	Yes	
		(19 , 16)	<19-20-14-15-16>	Yes	

DU paths for commission problem

Test case id	Description	Variables Path (Beginning, End nodes)	Du Paths	Definition clear?	Comments
7	Check for stocks variable (DEF(stocks,15) and USE(stocks,17)	(15 , 17)	<15-16-17>	Yes	
8	Check for sales DEF(sales, 27) and USE(Sales, 28), USE(Sales , 29), USE(Sales,33) , USE(Sales , 34) , USE(Sales,37) , USE(Sales , 39)	(27 ,28)	<27-28>	Yes	
		(27 , 29)	<27-28-29>	Yes	
		(27 , 33)	<27-28-29-30-31-32-33>	Yes	
		(27 , 34)	<27-28-29-34>	Yes	
		(27 , 37)	<27-28-29-34-35-36-37>	Yes	
		(27 , 39)	<27-28-29-34-38-39>	Yes	
9	Check for Commission variable DEF(comm, 31,32,33) , DEF(comm,34,35) and DEF(comm,39) and USE(comm,42)	((31,32,33),42)	<31-32-33-42>	Yes	
		((34 , 35) , 42)	<34-35-42>	Yes	
		((39 , 42)	<39 - 42>	Yes	

Thank You