

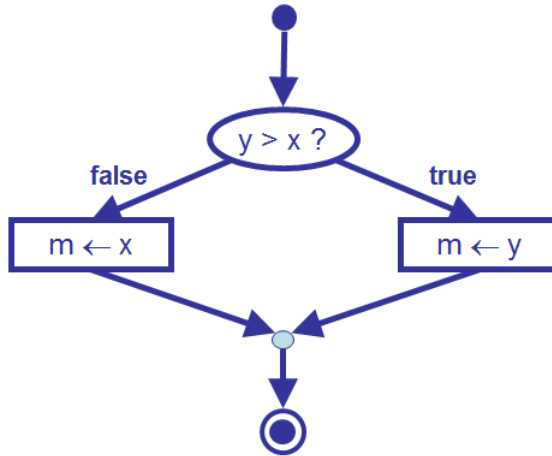
1. Section 5 Exercises

Program Memory

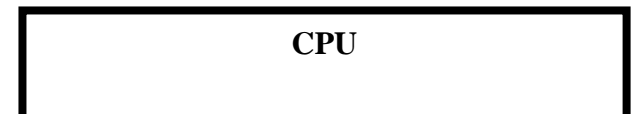
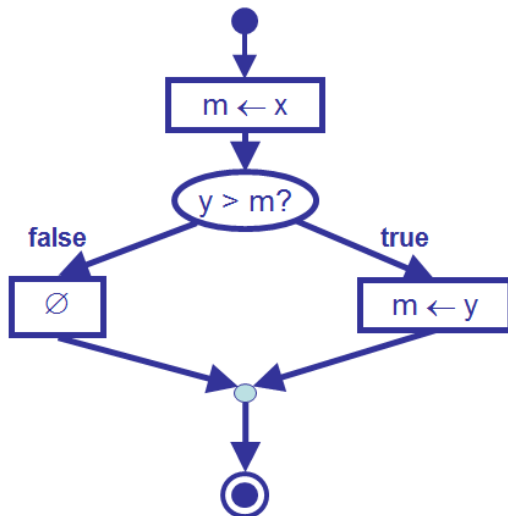
Exercise 5-1 - Back to the Larger of Two Numbers

Working memory

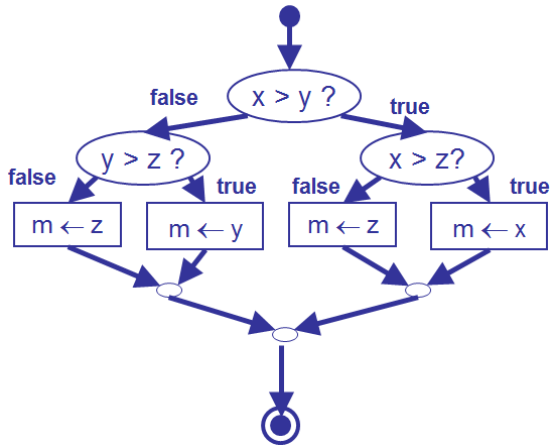
GIVENS: x, y (two numbers)
RESULT: m (the larger of x and y)
HEADER: m ← max2(x, y)
BODY:



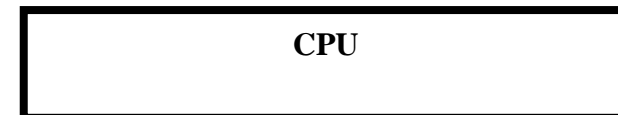
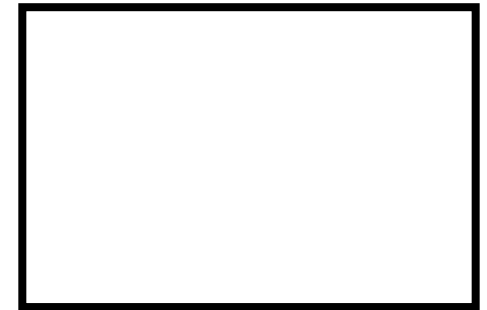
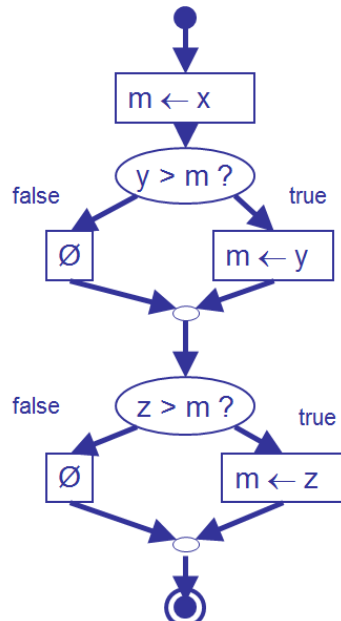
OR



GIVENS: x, y, z (three numbers)
RESULT: m (the larger of x, y and z)
HEADER: m ← max3(x,y,z)
BODY: (Nested tests)

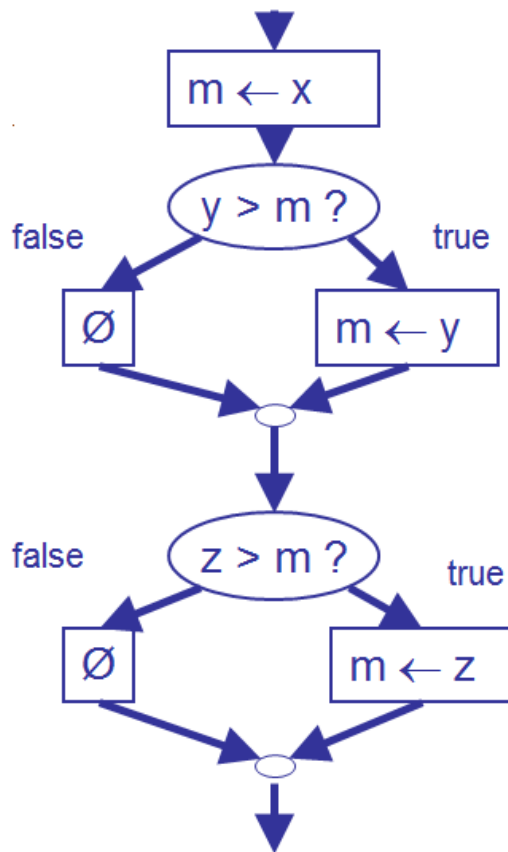


OR (Sequence of tests)



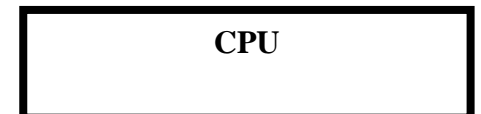
GIVENS: x, y, z (three numbers)
RESULT: m (the larger of x, y and z)
HEADER: m ← max3(x, y, z)
BODY:

Sequence of tests



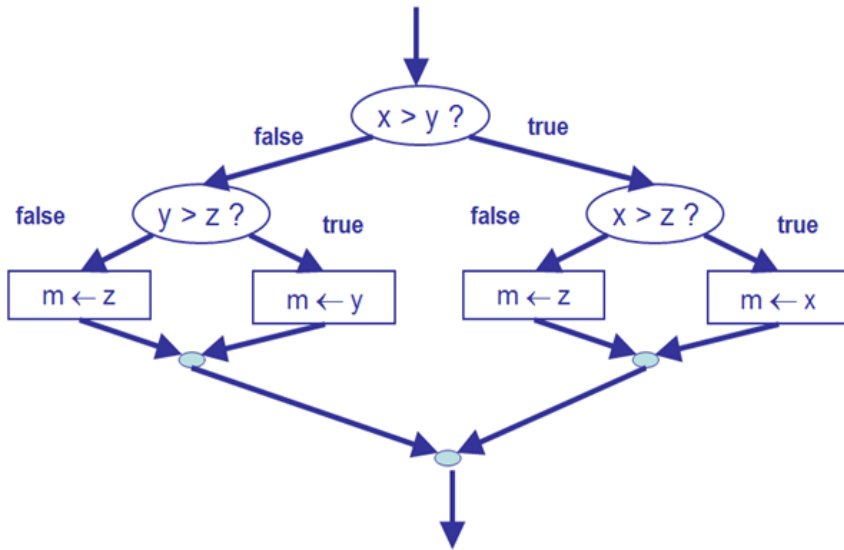
```

public double max3(double x,
                    double y, double z)
{
    double m;
    m = x;
    if ( y > m )
    {
        m = y;
    }
    else
    {
        /* do nothing*/;
    }
    if ( z > m )
    {
        m = z;
    }
    else
    {
        /* do nothing*/;
    }
    return m;
}
    
```



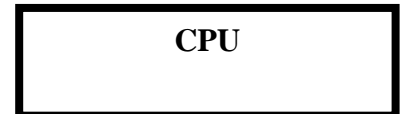
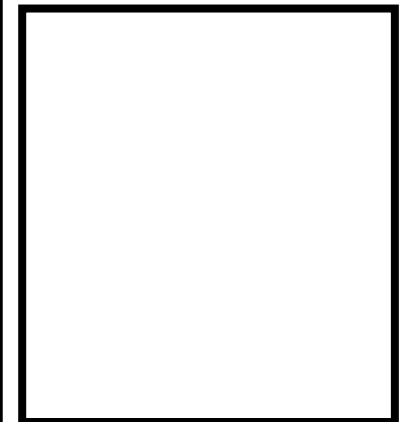
GIVENS: x, y, z (three numbers)
RESULT: m (the larger of x, y and z)
HEADER: m ← max3(x, y, z)
BODY:

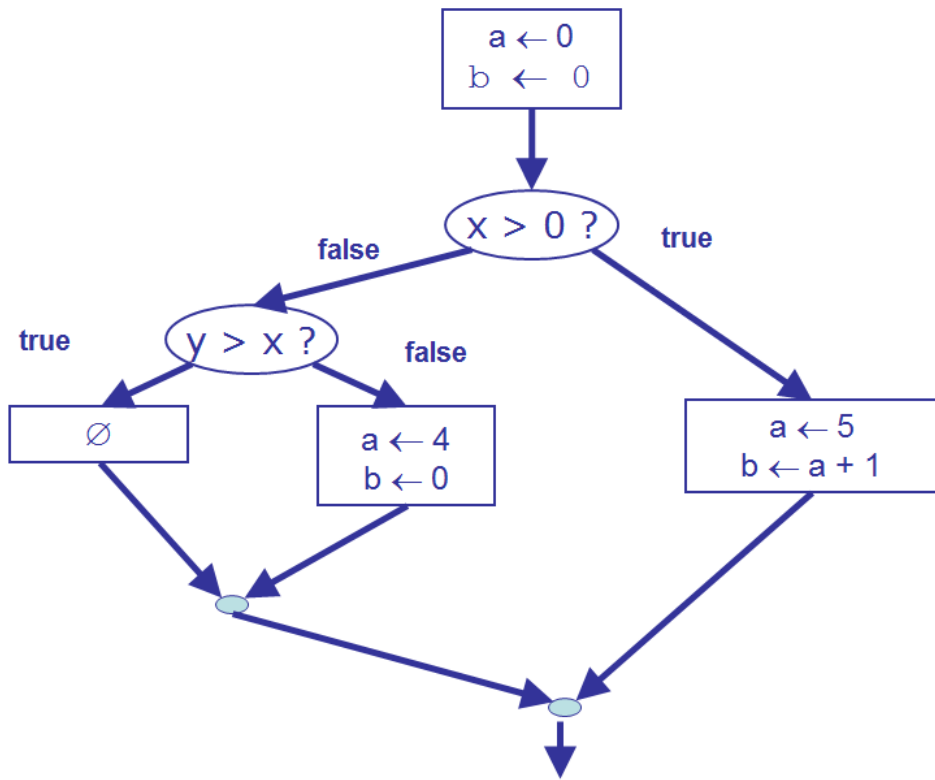
Nested tests



```

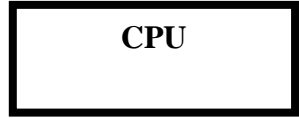
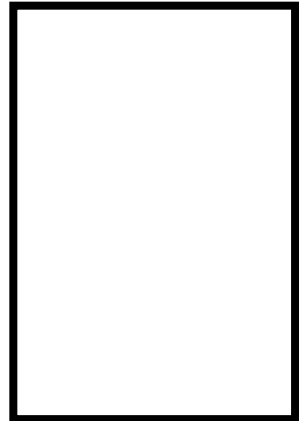
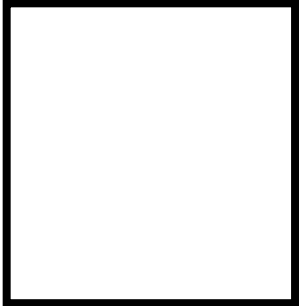
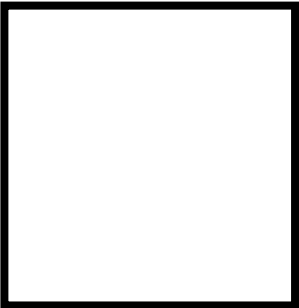
public double max3(double x,
                   double y, double z)
{
    double m;
    if ( x > y )
    {
        if ( x > z )
        {
            m = x;
        }
        else
        {
            m = z;
        }
    }
    else
    {
        if ( y > z )
        {
            m = y;
        }
        else
        {
            m = z;
        }
    }
    return m;
}
    
```





```

{
  a = 0;
  b = 0;
  if ( x > 0 )
  {
    a = 5;
    b = a + 1;
  }
  else
  {
    if ( y > x )
    {
      a = 4;
      b = 0;
    }
    else
    {
      /*do
      nothing*/;
    }
  }
}
  
```



GIVENS: x, y, z (three numbers)
RESULT: m (the larger of x, y and z)
HEADER: m ← max3(x, y, z)
BODY:

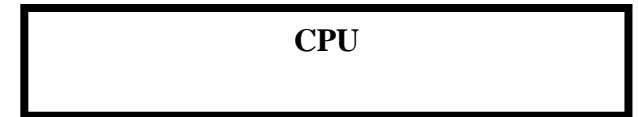
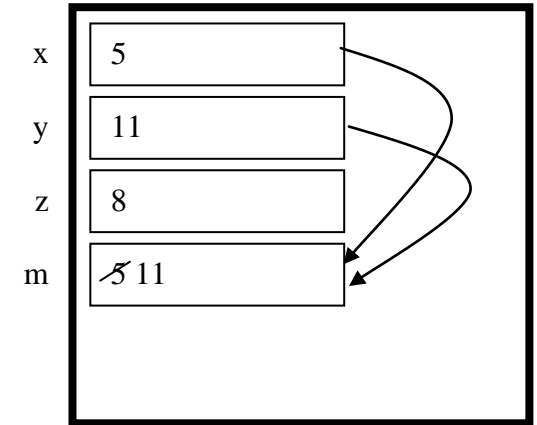
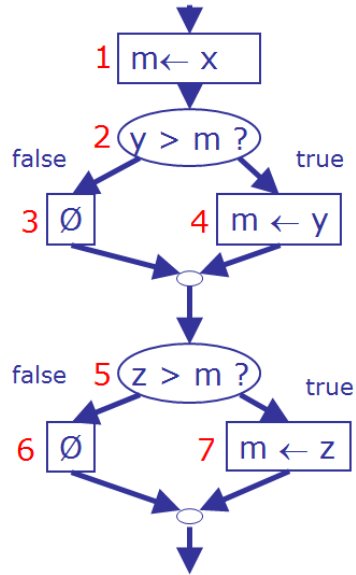
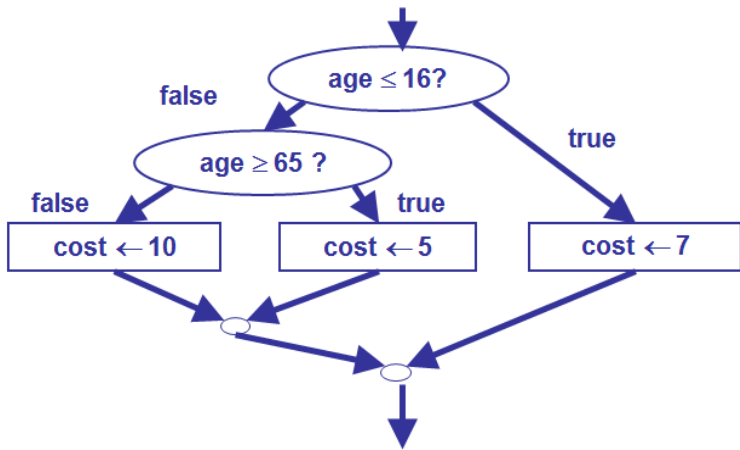


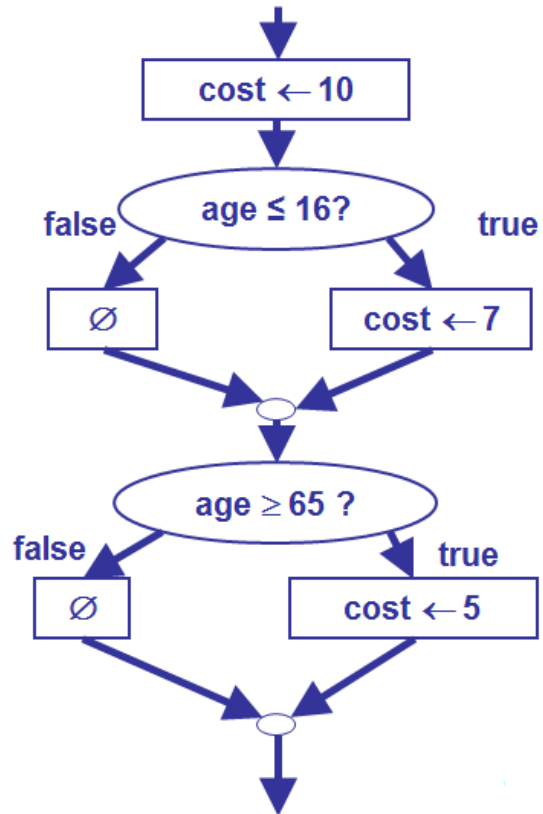
Table 1 – Trace for m ← max3(5, 11, 8)

	x	y	z	m
Initial values	5	11	8	?
1. m ← x				5
2. y > m: true				
3. m ← y				11
4. z > m: false				
5. ∅				

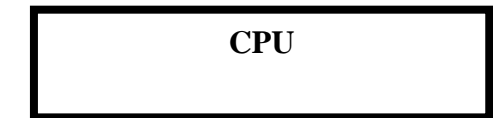
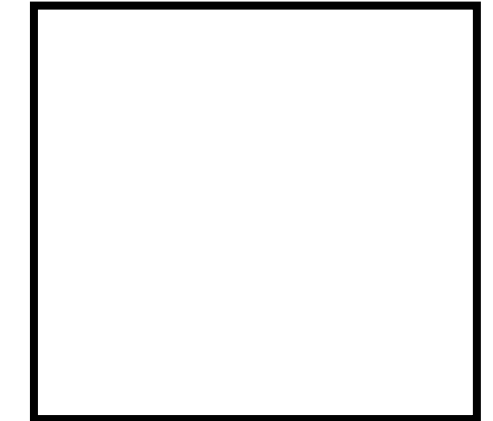
GIVENS: age (persons age)
 RESULT: cost (ticket cost)
 HEADER: cost ← ticketCost(age)
 BODY:



(Version 1: Nested Tests)

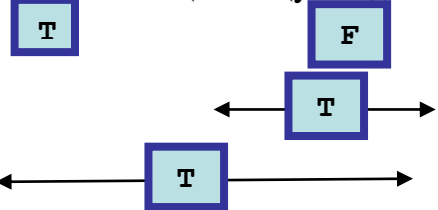
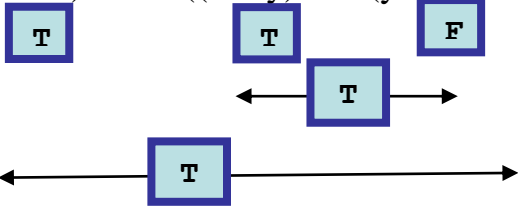
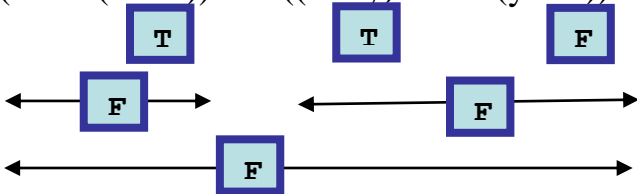
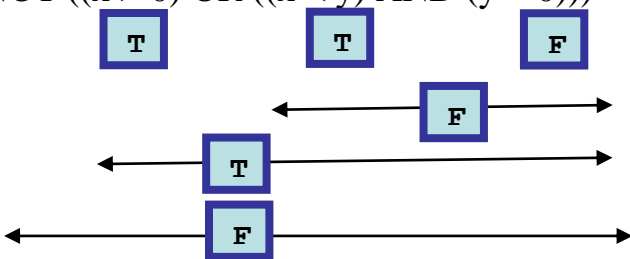


(Version 2: sequence of tests)



Exercise 5-10 - More Compound Boolean Expressions

Suppose $x = 5$ and $y = 10$.

Expression	Value
$(x > 0) \text{ AND } (\text{NOT } (y = 0))$ 	TRUE
$(x > 0) \text{ AND } ((x < y) \text{ OR } (y = 0))$ 	TRUE
$(\text{NOT } (x > 0)) \text{ OR } ((x < y) \text{ AND } (y = 0))$ 	FALSE
$\text{NOT } ((x > 0) \text{ OR } ((x < y) \text{ AND } (y = 0)))$ 	FALSE