```html
<html>
    <head>
        <title>A8</title>
        <style>

        </style>
        <script>

        </script>
    </head>
    <body>
    <?php
        /*
                    a
                b           c
              d    e      f   g
            h  i  j  k  l  m  n  o
        */

        $tree['a'] = ['b', 'c'];
        $tree['b'] = ['d', 'e'];
        $tree['c'] = ['f', 'g'];
        $tree['d'] = ['h', 'i'];
        $tree['e'] = ['j', 'k'];
        $tree['f'] = ['l', 'm'];
        $tree['g'] = ['n', 'o'];

        $count = count($tree) - 1;
        $values = array();

        #Generates random values for all nodes
        while($count >= 0)
        {
            $keys = array_keys($tree);
            $currentNode = $tree[$keys[$count]];
            $sum = 0;
            foreach ($currentNode as $leaf)
            {
                $innerKeys = array_keys($values);
                $exists = false;
                foreach ($innerKeys as $v)
                {

                    if ($v == $leaf)
                    {
                        $exists = true;
                    }

                }

                if ($exists)
```

```php
        {
            $sum += $values[$leaf];
        }
        else
        {
            $num = rand(1, 10);
            $values[$leaf] = $num;
            $sum += $num;
        }
    }
    $values[$keys[$count]] = $sum;
    $count--;
}

treePrint($tree, $values, 'a');

function treePrint($tree, $values, $node)
{
    if (isset($values[$node]))
    {
        echo $node."(".$values[$node],")<br />";
    }
    else
    {
        echo $node."(root)<br />";
    }

    if (!isset($tree[$node]))
    {
        return;
    }

    foreach ($tree[$node] as $n)
    {
        treePrint($tree, $values, $n);
    }
}



#Selected node of subtree to sum
$subTreeNode = 'c';

echo "<br />Sub tree '".$subTreeNode."':<br />";
$subTreeSum = treeValue($tree, $values, $subTreeNode);

function treeValue($tree, $values, $node)
{
    static $sum;
    $sum += $values[$node];
```

```php
        if (isset($values[$node]))
        {
            echo $node."(".$values[$node],")<br />";
        }

        if (!isset($tree[$node]))
        {
            return;
        }

        foreach ($tree[$node] as $n)
        {
            treevalue($tree, $values, $n);
        }
        return $sum;
    }

    echo "Sub tree total value: ".$subTreeSum;
?>

    </body>
</html>
```

Test Case 1

```
/*
                    a
          b                   c
      d       e         f       g
    h   i   j   k     l   m   n   o
*/

$tree['a'] = ['b', 'c'];
$tree['b'] = ['d', 'e'];
$tree['c'] = ['f', 'g'];
$tree['d'] = ['h', 'i'];
$tree['e'] = ['j', 'k'];
$tree['f'] = ['l', 'm'];
$tree['g'] = ['n', 'o'];
```

```
#Selected node of subtree to sum
$subTreeNode = 'c';
```

a(52)
b(20)
d(13)
h(3)
i(10)
e(7)
j(2)
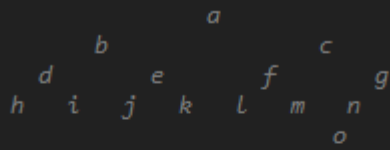k(5)
c(32)
f(12)
l(4)
m(8)
g(20)
n(10)
o(10)

Sub tree 'c':
c(32)
f(12)
l(4)
m(8)
g(20)
n(10)
o(10)
Sub tree total value: 96

Test Case 2

```
/*
                a
        b               c
    d       e       f       g
  h   i   j   k   l   m   n
                          o


*/

$tree['a'] = ['b', 'c'];
$tree['b'] = ['d', 'e'];
$tree['c'] = ['f', 'g'];
$tree['d'] = ['h', 'i'];
$tree['e'] = ['j', 'k'];
$tree['f'] = ['l', 'm'];
$tree['g'] = ['n'];
$tree['n'] = ['o'];
```

```
#Selected node of subtree to sum
$subTreeNode = 'b';
```
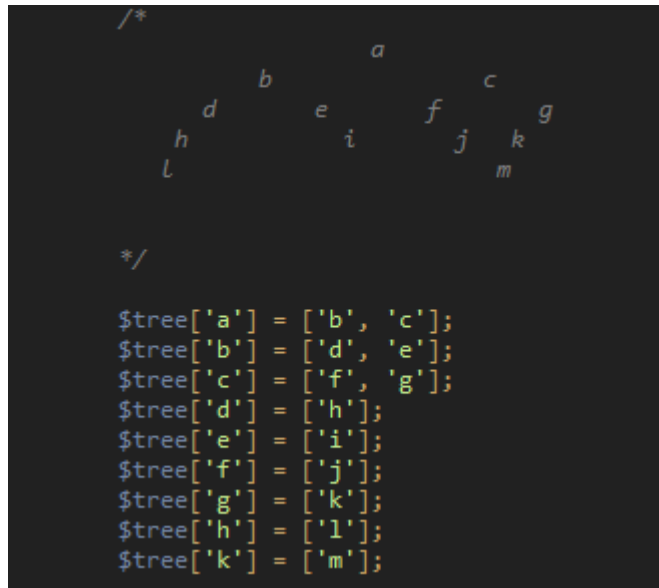
```
a(40)
b(25)
d(14)
h(7)
i(7)
e(11)
j(2)
k(9)
c(15)
f(9)
l(3)
m(6)
g(6)
n(6)
o(6)

Sub tree 'b':
b(25)
d(14)
h(7)
i(7)
e(11)
j(2)
k(9)
Sub tree total value: 75
```

Test Case 3

```
/*
                        a
            b                   c
        d       e           f       g
      h           i           j   k
      l                           m


*/

$tree['a'] = ['b', 'c'];
$tree['b'] = ['d', 'e'];
$tree['c'] = ['f', 'g'];
$tree['d'] = ['h'];
$tree['e'] = ['i'];
$tree['f'] = ['j'];
$tree['g'] = ['k'];
$tree['h'] = ['l'];
$tree['k'] = ['m'];
```

```
#Selected node of subtree to sum
$subTreeNode = 'b';
```

a(17)
b(11)
d(8)
h(8)
l(8)
e(3)
i(3)
c(6)
f(1)
j(1)
g(5)
k(5)
m(5)

Sub tree 'b':
b(11)
d(8)
h(8)
l(8)
e(3)
i(3)
Sub tree total value: 41