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CSIS618
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Homework 2

Question 2.1

$G_{integer}$ – develop left-most grammar for 4520

Integer ⇒ *Integer Digit*
⇒ *Integer Digit Digit*
⇒ *Integer Digit Digit Digit*
⇒ *Digit Digit Digit Digit*
⇒ 4 *Digit Digit Digit*
⇒ 4 5 *Digit Digit*
⇒ 4 5 2 *Digit*
⇒ 4 5 2 0

Assuming the first line is the first "step", 8 steps are required for this derivation. Generally speaking, 2*d* steps are needed to derive an integer with an arbitrary number of digits *d*.

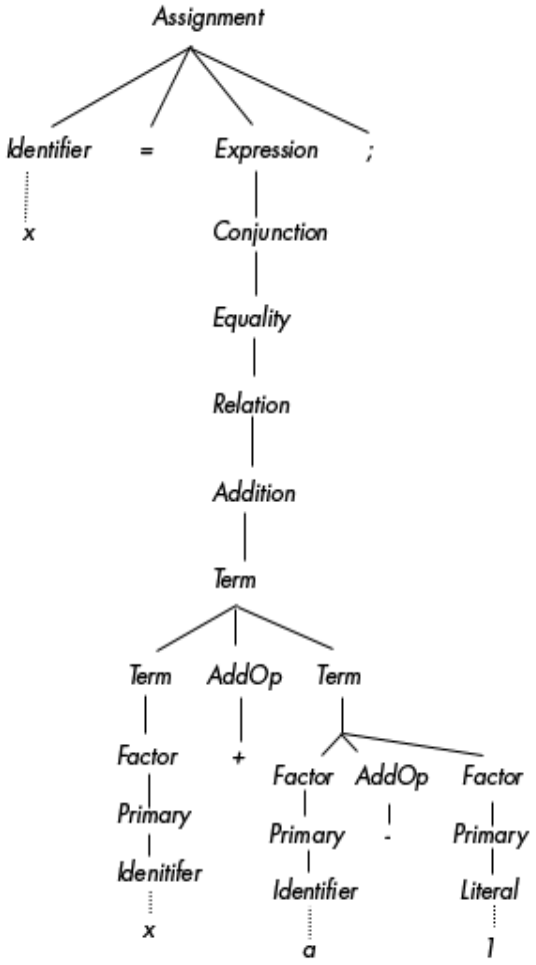
Question 2.14

a2i – right-most derivation – Fig 2.7

Identifier → *Letter* {*Letter* | *Digit*}
→ *Letter Digit Letter*
→ *Letter Digit* i
→ *Letter* 2i
→ a2i

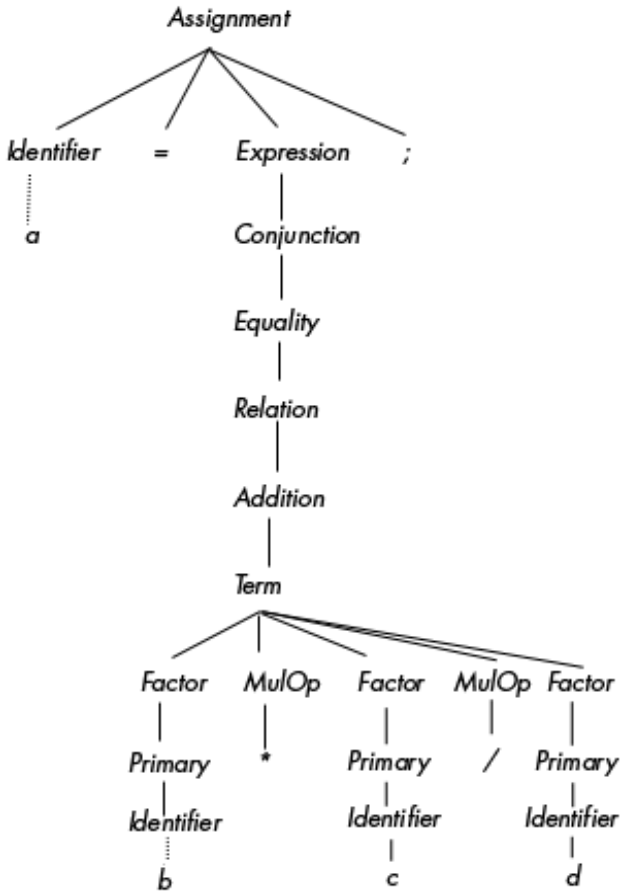
Question 2.5a

```
x=x+a-1;
```

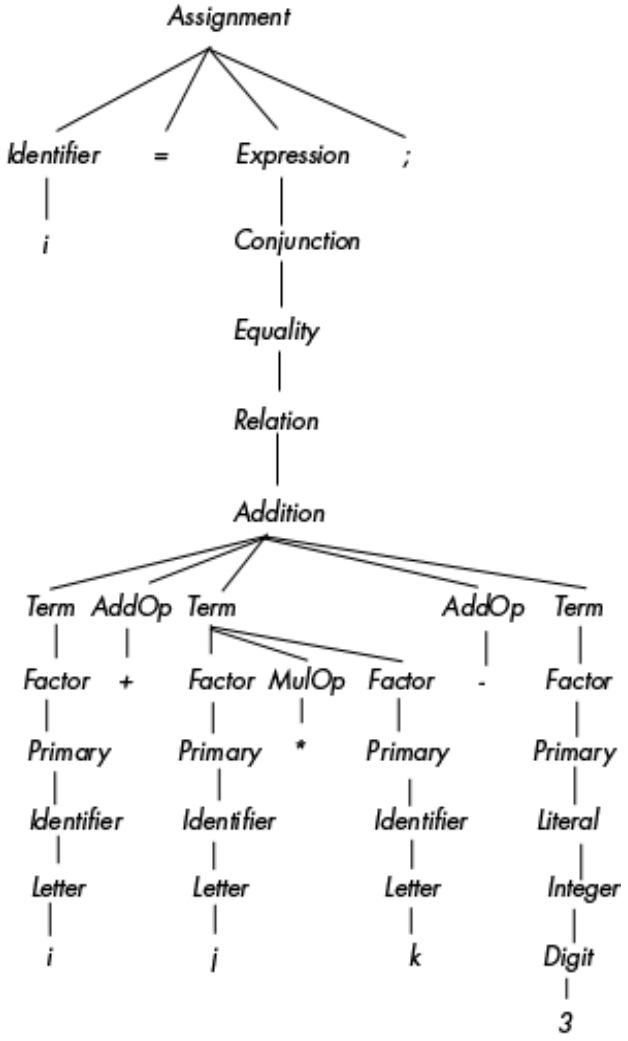


Question 2.5b

a=b*c/d;

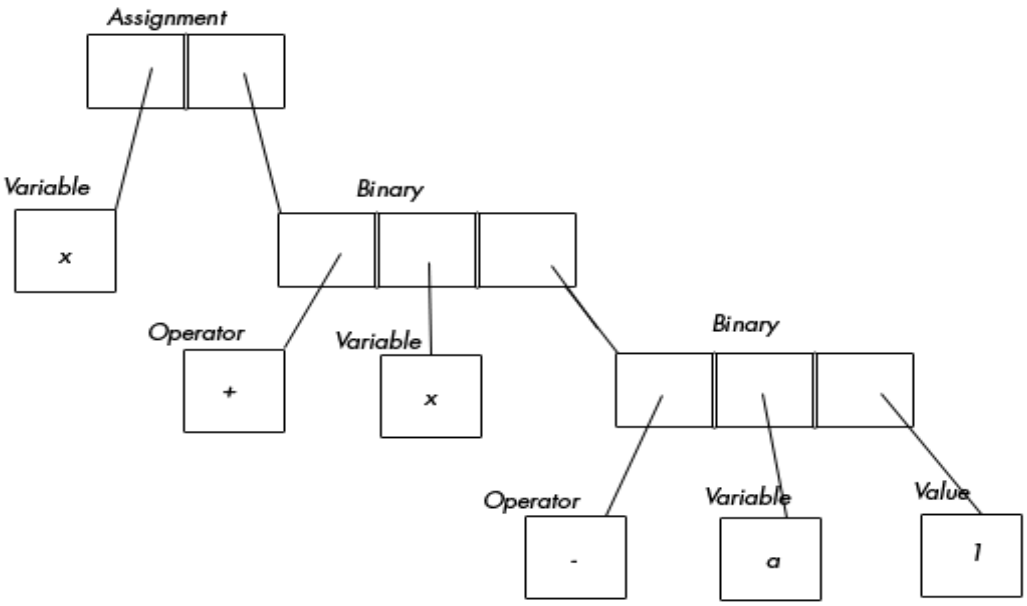

Assignment
Identifier
=
Expression
;
a
Conjunction
Equality
Relation
Addition
Term
Factor
MulOp
Factor
MulOp
Factor
Primary
*
Primary
/
Primary
Identifier
Identifier
Identifier
b
c
d

Question 2.5c

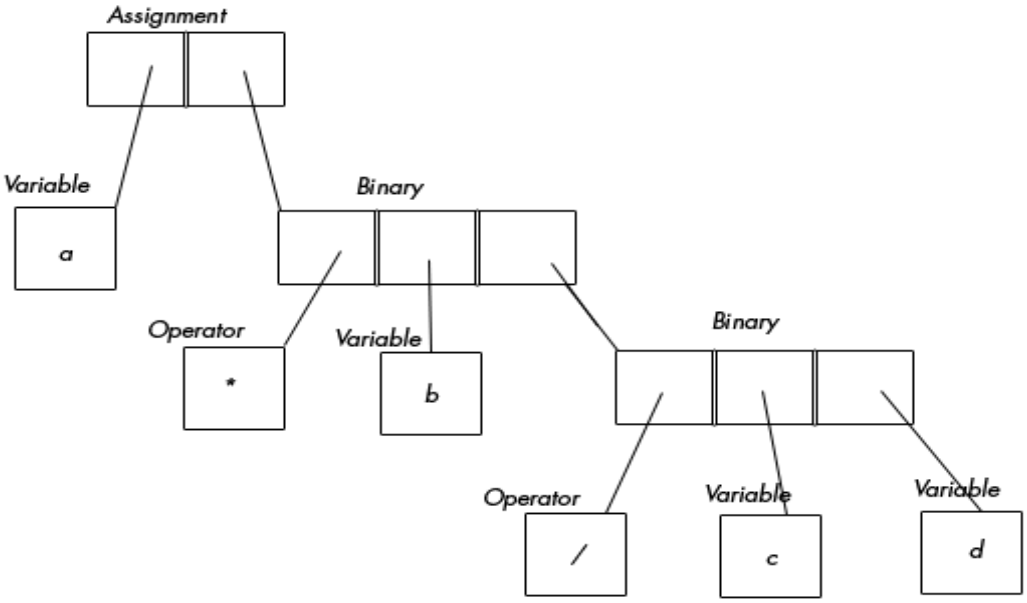


Question 2.20

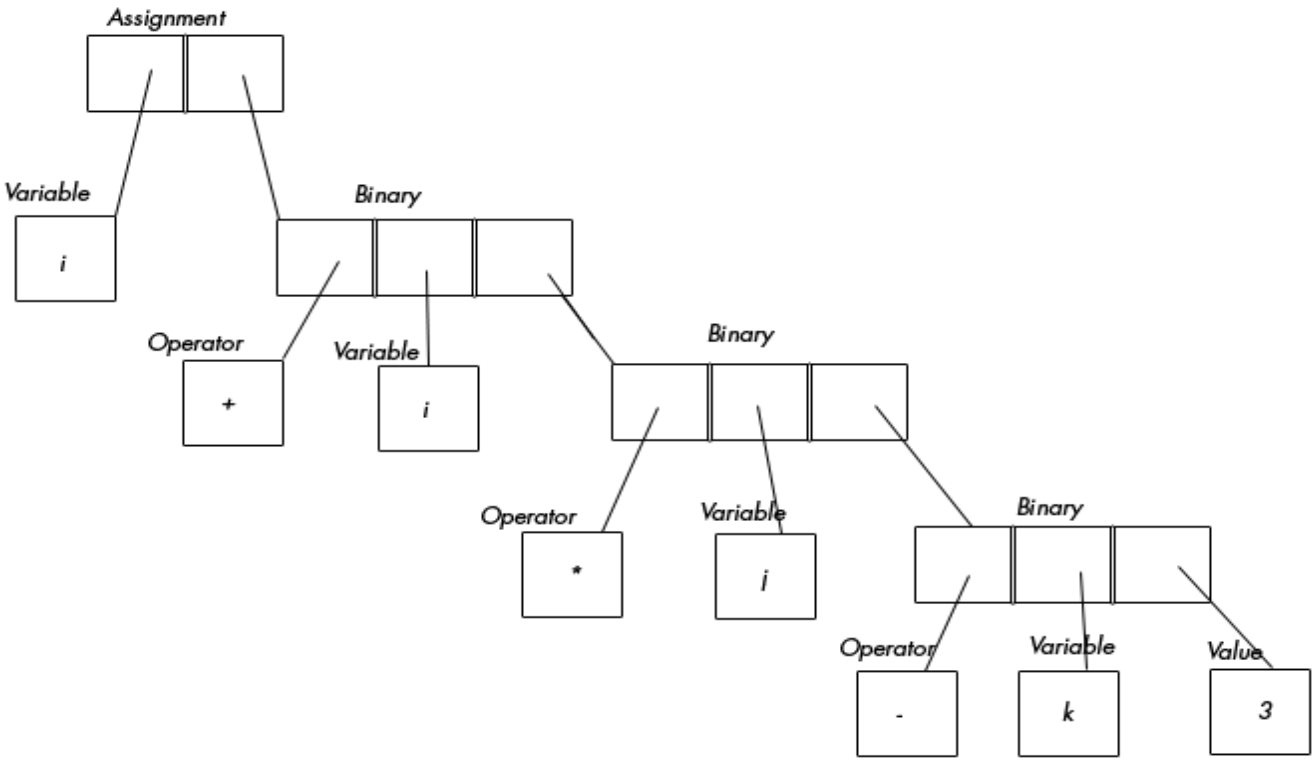
```
x=x+a-1;
```


Assignment
Variable
x
Binary
Operator
+
Variable
x
Binary
Operator
-
Variable
a
Value
1

a=b*c/d;


Assignment
Variable
a
Binary
Operator
*
Variable
b
Binary
Operator
/
Variable
c
Variable
d

I=i+j*k-3;


Assignment
Variable
i
Binary
Operator
+
Variable
i
Binary
Operator
*
Variable
i
Binary
Operator
-
Variable
k
Value
3