

< insert ACGT >



\*\*\*

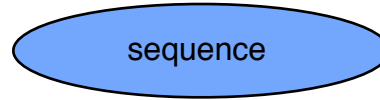


empty node



internal node

print

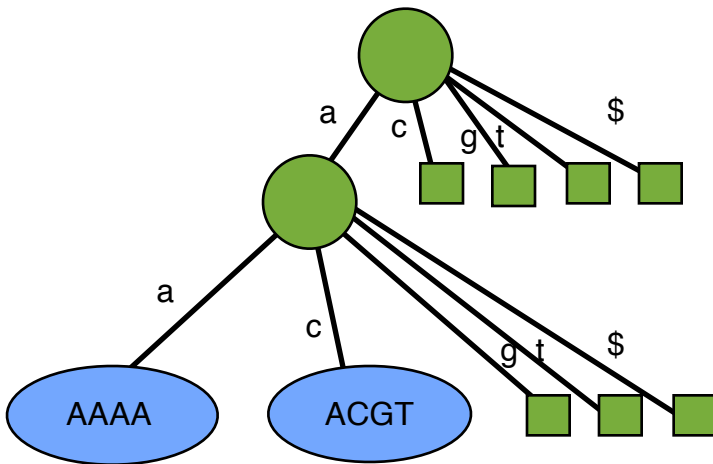


leaf node

expected output:

**ACGT**

< insert AAAA >



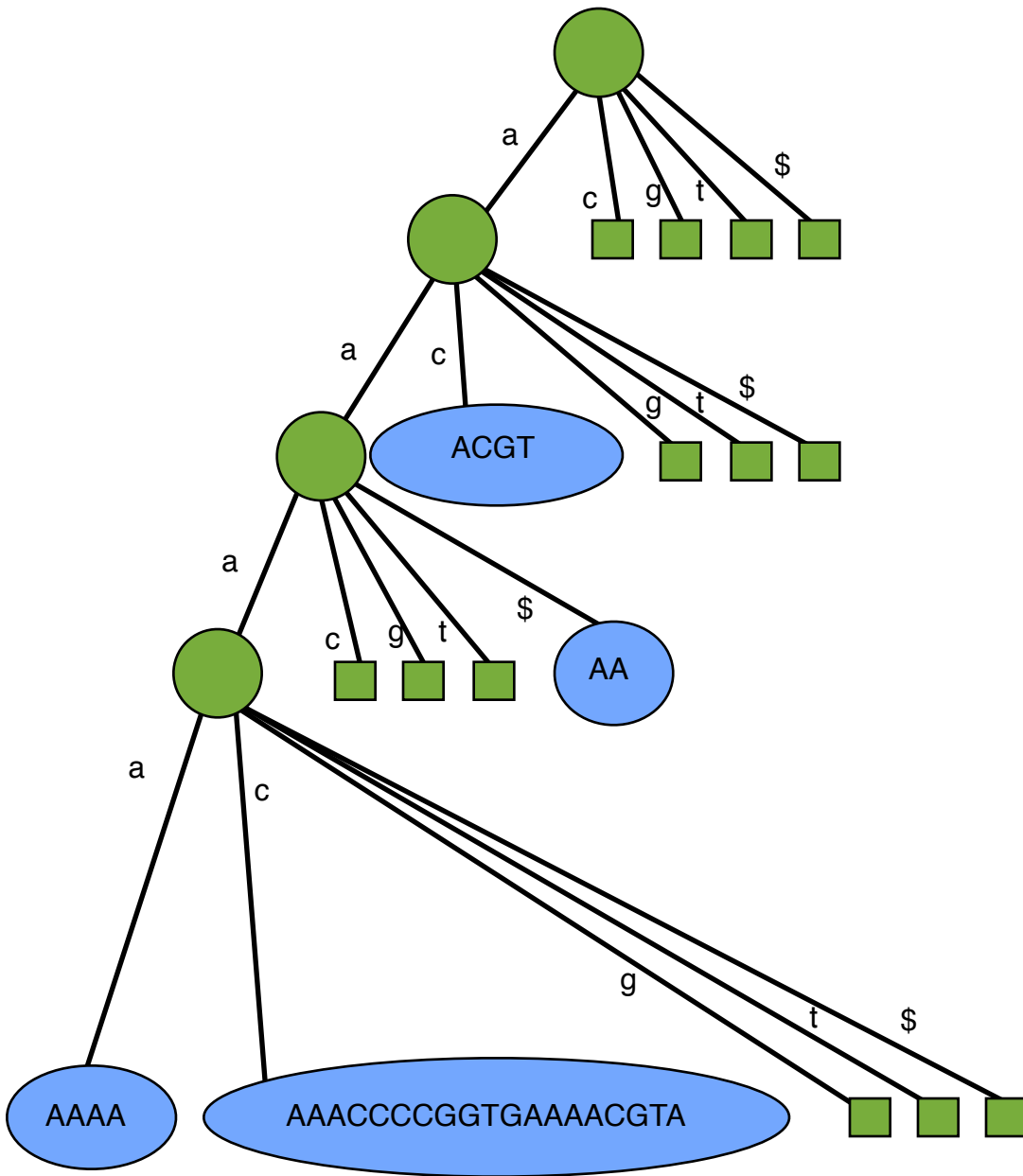
print

expected output:

**A  
A  
AAAA  
ACGT  
E  
E  
E  
E  
E  
E  
E**



insert AAACCCCGGTGAAAACGTA



**print**

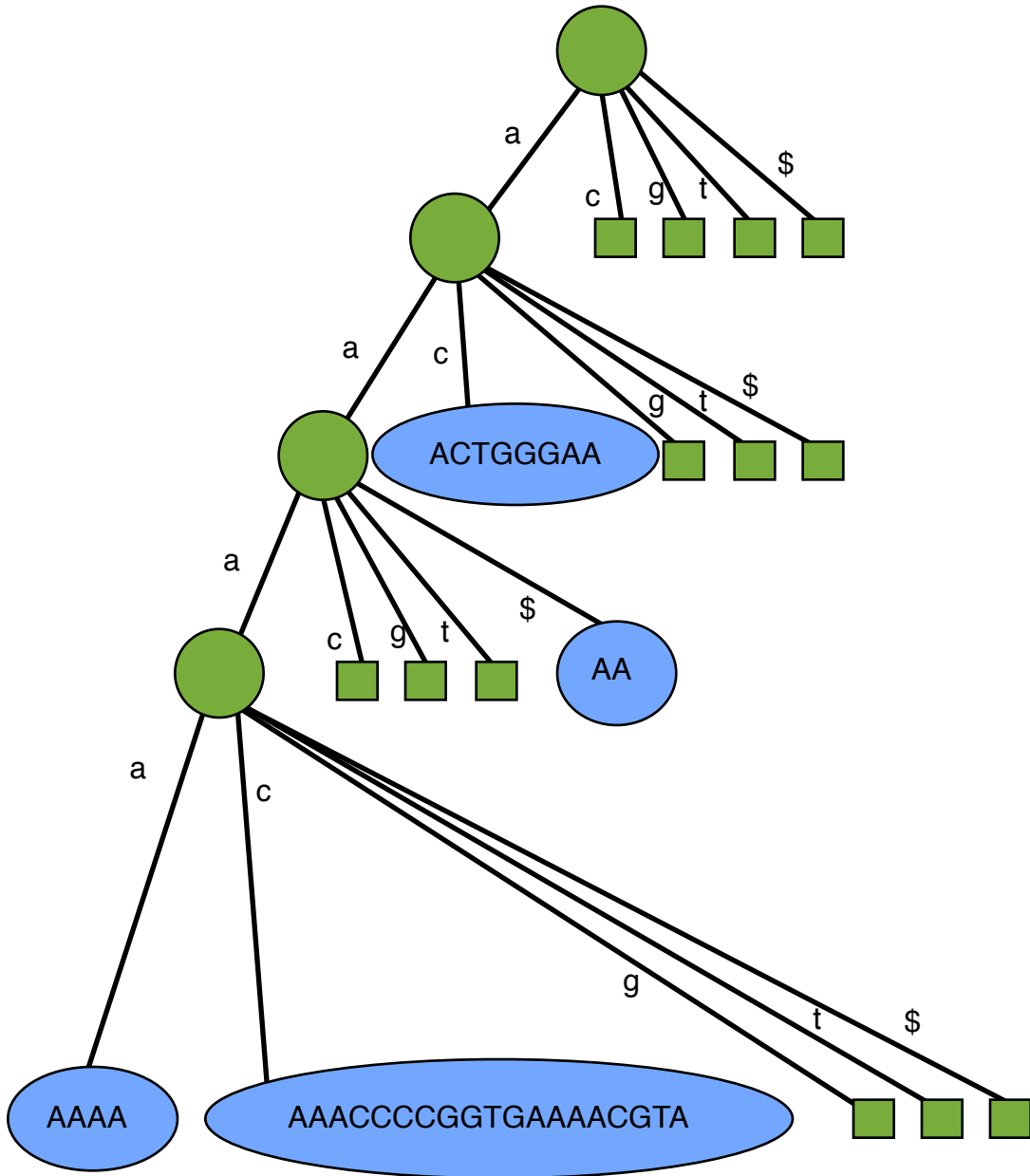
expected output:

```
I
 |
 |
 |
 |
 |  AAAA
 |  AAACCCCGGTGAAAACGTA
 |  E
 |  E
 |  E
 |  E
 |  E
 |  E
 |  E
 |  AA
 |  ACGT
 |  E
 |  E
 |  E
 |  E
 |  E
 |  E
 |  E
```





remove ACGT



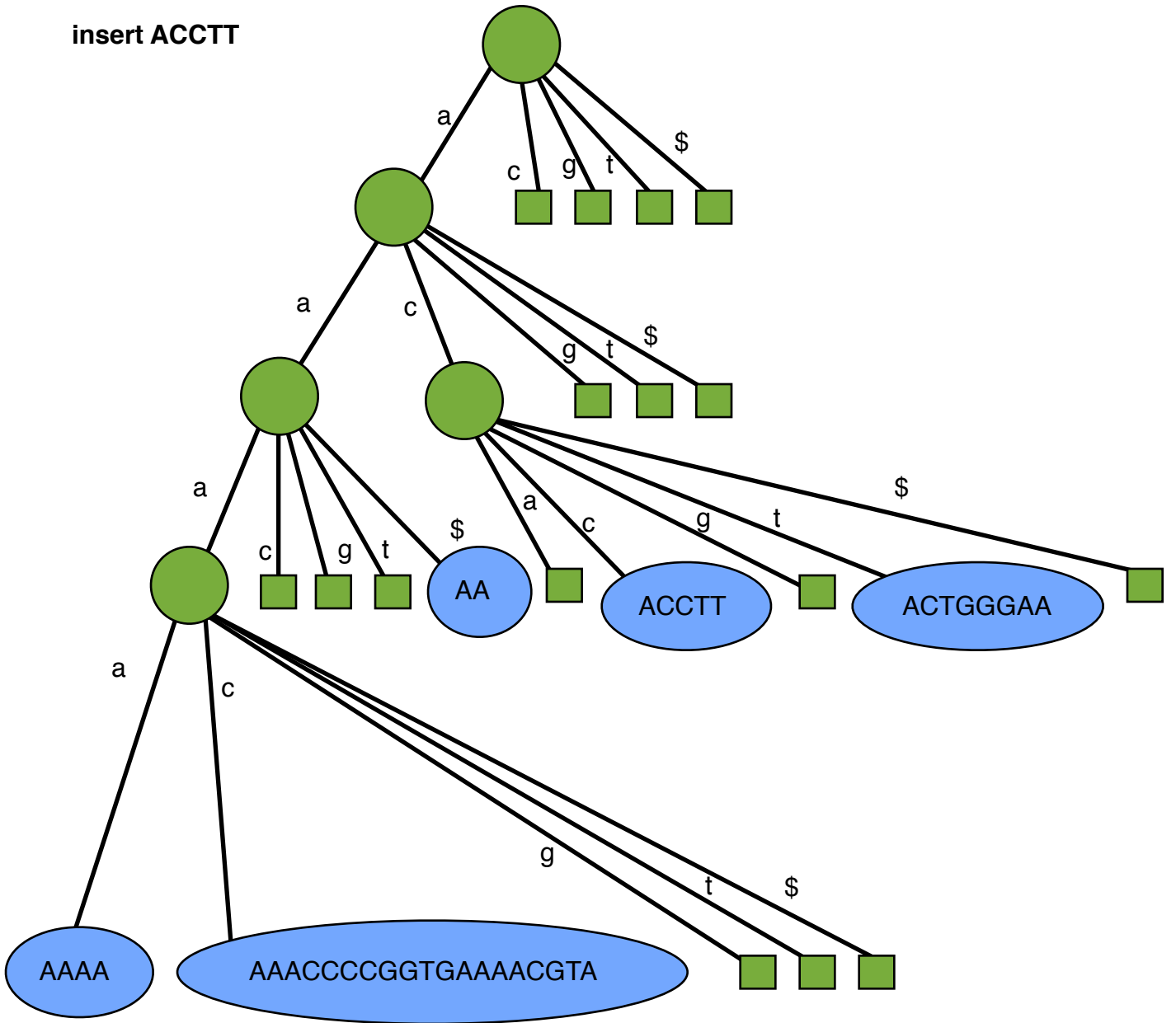
**print**

expected output:

```
|
|
|
|
  AAAA
  AAACCCCGGTGAAAACGTA
  E
  E
  E
  E
  E
  E
  E
  AA
  ACTGGGAA
  E
  E
  E
  E
  E
  E
  E
  E
```



insert ACCTT

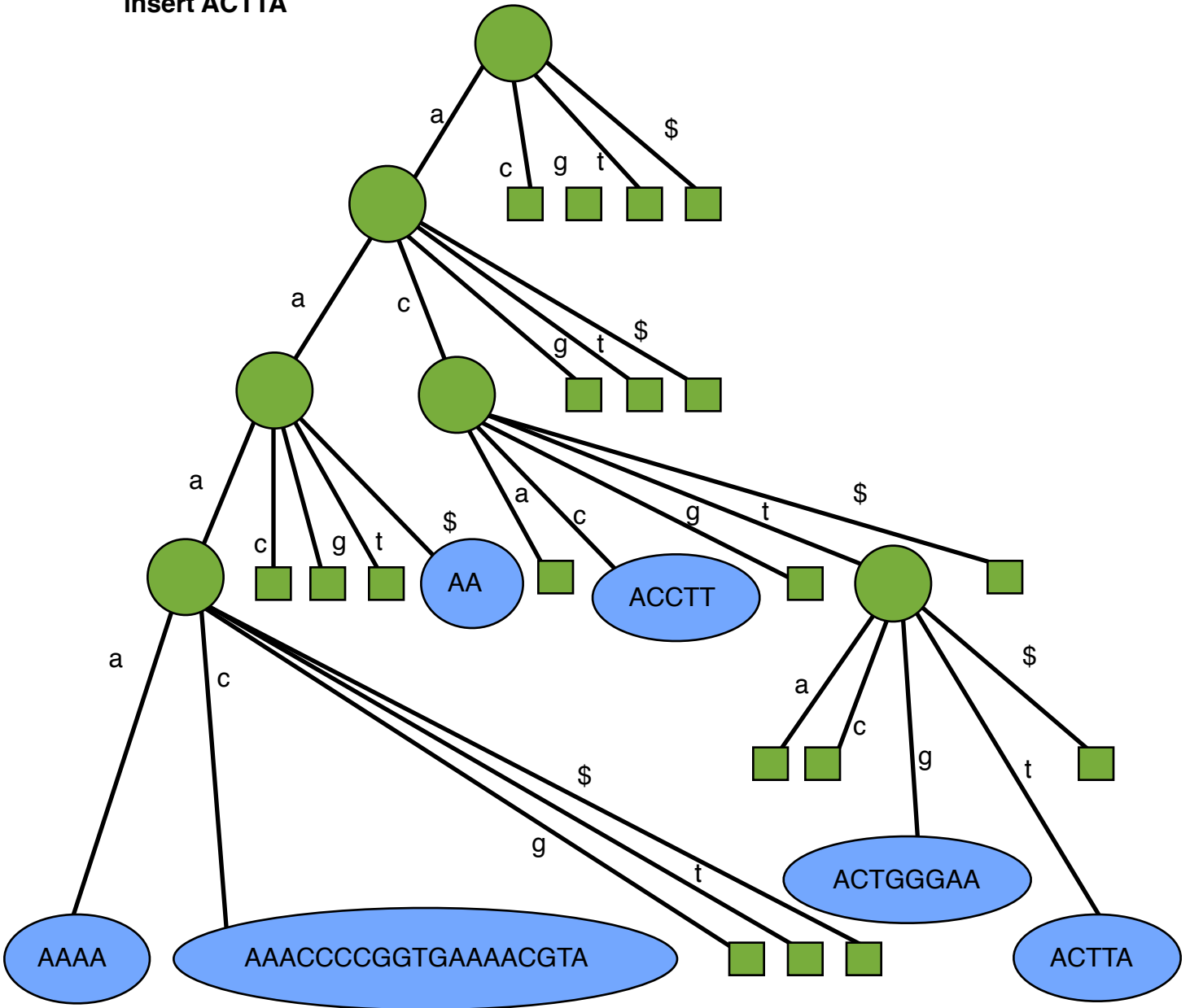


**print**

expected output:

```
I
 |
 |
 |
 |
 |  AAAA
 |  AAACCCCGGTGAAAACGTA
 |  E
 |  E
 |  E
 |  E
 |  E
 |  E
 |  E
 |  AA
 |
 |  E
 |  ACCTT
 |  E
 |  ACTGGGAA
 |  E
 |  E
 |  E
 |  E
 |  E
 |  E
 |  E
```

insert ACTTA

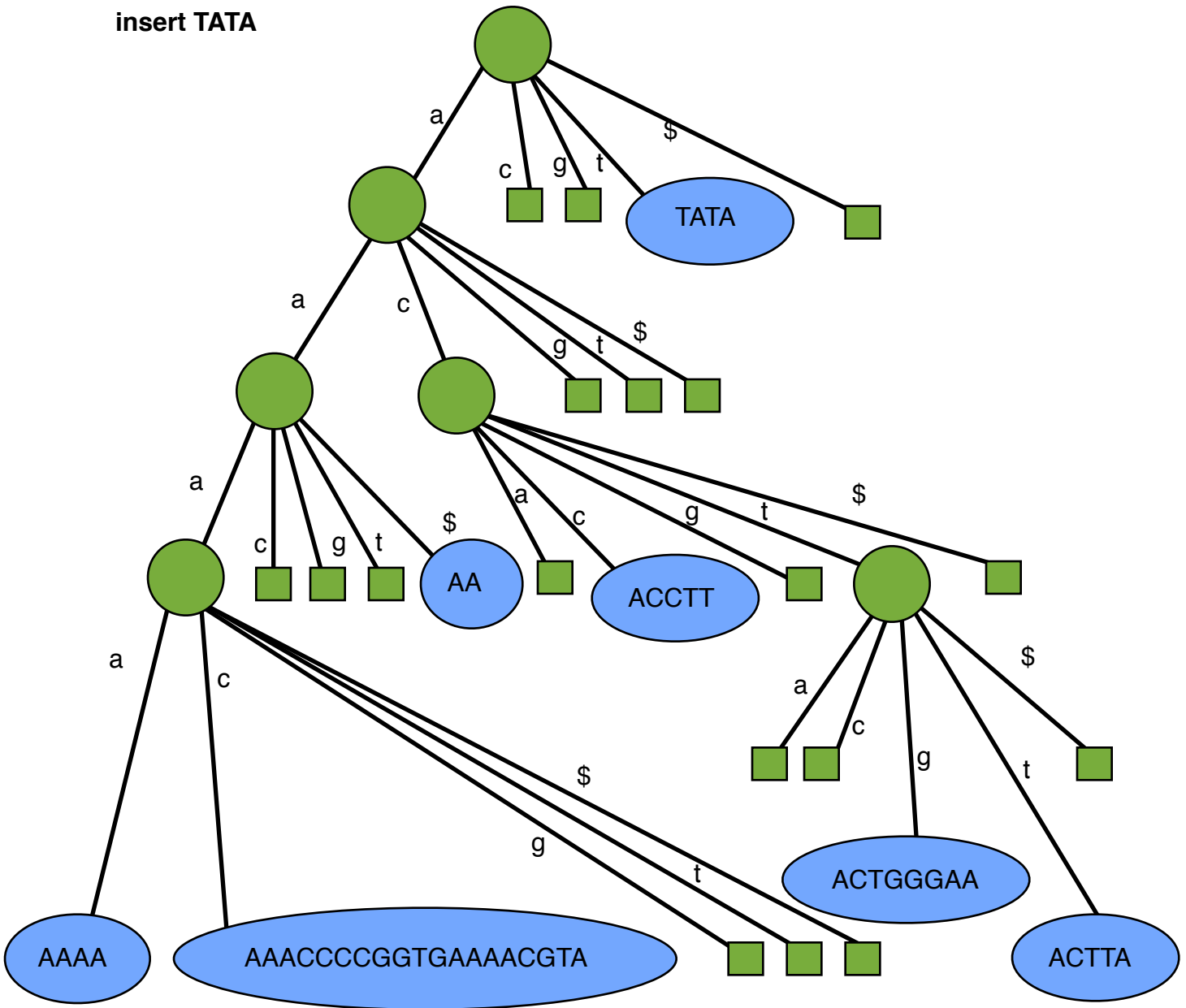


**print**

expected output:

```
|
|
|
|
|  AAAA
|  AAACCCCGGTGAAAACGTA
|  E
|  E
|  E
|  E
|  E
|  E
|  AA
|
|  E
|  ACCTT
|  E
|
|  E
|  E
|  ACTGGGAA
|  ACTTA
|  E
|  E
|  E
|  E
|  E
|  E
|  E
|  E
```

insert TATA

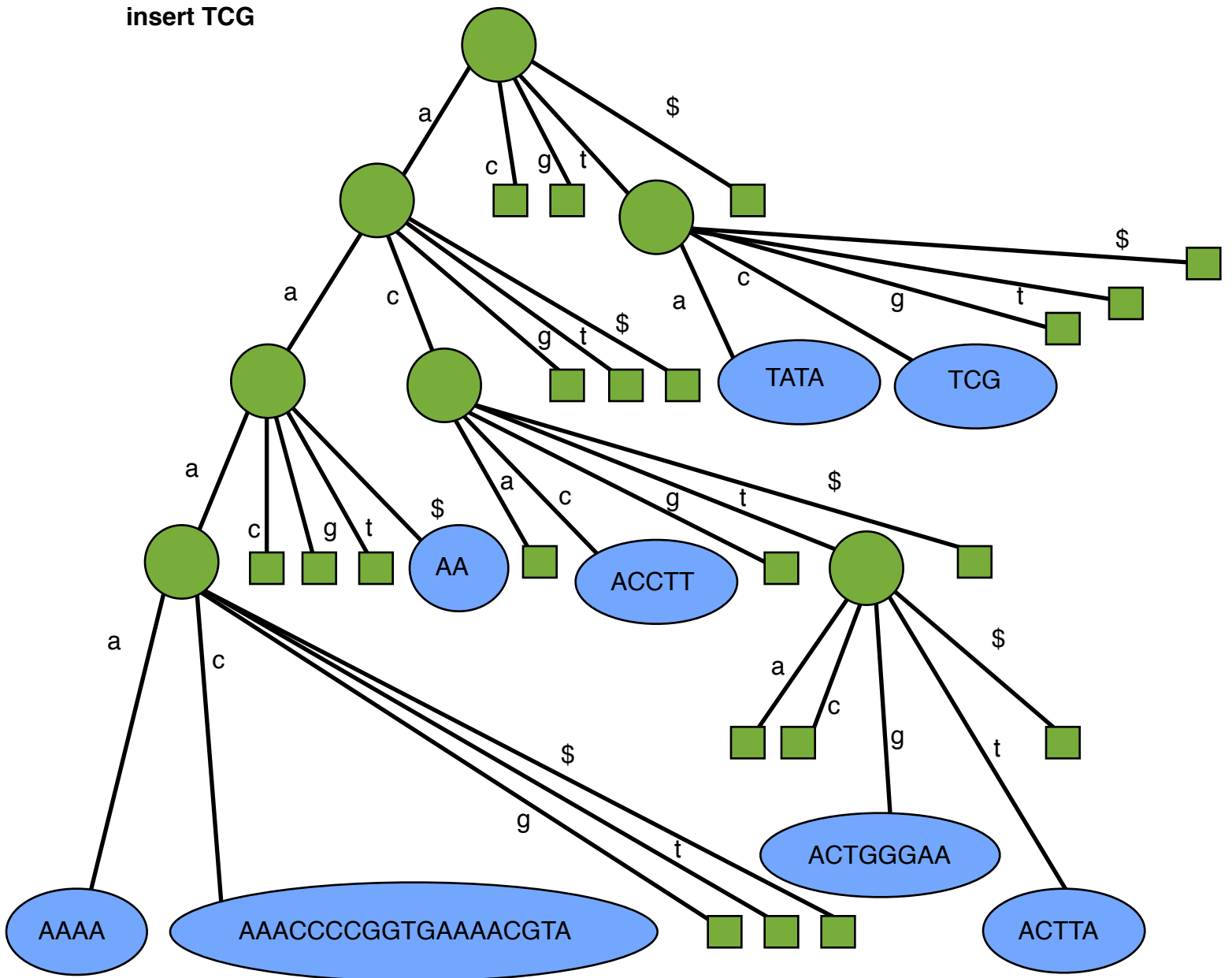


**print**

expected output:

```
|
|
|
|
| AAAA
| AAACCCCGGTGAAAACGTA
| E
| E
| E
| E
| E
| E
| AA
|
| E
| ACCTT
| E
|
| E
| E
| ACTGGGAA
| ACTTA
| E
| E
| E
| E
| E
| E
| E
| TATA
| E
```

insert TCG







**print lengths**

expected output:

```
|
|
|
|
| AAAA: length 4
| AAACCCCGGTGAAAACGTA: length 19
| E
| E
| E
| E
| E
| E
| E
| AA: length 2
|
| E
| ACCTT: length 5
| E
|
| E
| E
| ACTGGGAA: length 8
| ACTTA: length 5
| E
| E
| E
| E
| E
| E
|
| TATA: length: 4
| TCG: length 3
| E
| E
| E
| E
```



**search AAAA\$**

expected output:

**# of nodes visited: 5**

**sequence: AAAA**

**search AA**

expected output:

**# of nodes visited: 13**

**sequence: AAAA**

**sequence: AAACCCCGGTGAAAACGTA**

**sequence: AA**

**search ACGT\$**

expected output:

**# of nodes visited: 4**

**no sequence found**