Homework 2 – Q2

Write a context-free grammar for the Mini-Pascal language in the BNF form, based on the sample.pas program.

Program → program-heading ; program-block
program-heading → program identifier
program-block → var-declaration-list ; func-declaration ; statements

var-declaration-list → var var-declaration ; (var-declaration | ε) ;
var-declaration → identifier (, identifier | ε) : type

func-declaration → function identifier (var-declaration-list)

statement-list → begin statement (; statement| ε) end
statement → attribution
| statement-list | if | while

if → if expression then statement else-part
else → else statement| ε
while → while expression do statement-list

attribution → identifier := expression
expression → simple-expression ((relational-operator simple-expression) | ε)
relational-operator → < | > | <= | >= | <>
simple-expression → term ((adding-operator term) | ε)
adding-operator → + | -
term → fact ((multiplying-operator fact) | ε)
multiplying-operator → * | /
fact → sign fact
| number
| (expression | ε)
| identifier
| function-call
function-call → identifier (expression (; expression | ε))
identifier → letter ((letter | digits | _) | ε)
number → digit (digit | ε)
letter → A | B | … | Z | a | b | … | z
digit → 0 | 1 |… |9
type → bool | integer | array | real
array-declaration→array[number..number] of type
array-element→ identifier : array-declaration