

1. GRAMMAR DEFINITION.

$$\Sigma = \{\Sigma_T, \Sigma_{NT}, S, P\}$$
$$\Sigma_T(\text{Terminal Symbols}) = \{\}$$
$$\Sigma_{NT}(\text{Non-Terminal Symbols}) = \{\}$$

S: is the axiom \ start symbol.

P: is the set of productions.

$$P = \{$$

FILE ::= START DATA END

START ::= {

END ::= }

DATA ::= VAR1 SEPARATOR VAR2 SEPARATOR VAR3

SEPARATOR ::= ,

EQUAL ::= :

Q ::= "

$$P ::= \cdot$$

ALPHABET ::= a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q |

r	s	t	u	v	w	x	y	z
---	---	---	---	---	---	---	---	---

NUMBERS ::= 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9

VAR1 ::= LABEL1 EQUALS VALUE1

$$\text{LABEL1} ::= Q \text{ NAME1 } Q$$
NAME1 ::= **Token Request**

VALUE1 ::= Q HHH Q (32H's)

H ::= **a** | **b** | **c** | **d** | **e** | **f** | NUMBERS

VAR2 ::= LABEL2 EQUALS VALUE2

$\text{LABEL2} ::= Q \text{ NAME2 } Q$

NAME2 ::= **Notification e-mail**

VALUE2 ::= 0 EMAIL 0

EMAIL ::= ENAME A DOMAIN P EXTENSION

$$\text{ENAME} ::= \text{ENAME ENAME} \mid \text{ALPHABET} \mid \text{NUMBERS}$$
$$A ::= @$$
$$\text{DOMAIN} ::= \text{ALPHABET} \mid \text{ALPHABET DOMAIN}$$

EXTENSION ::= ALPHABET ALPHABET | ALPHABET ALPHABET ALPHABET

VAR3 ::= LABEL3 EQUALS VALUE3

LABEL3 ::= Q NAME3 Q

NAME3 ::= **Request Date**

VALUE3 ::= Q DATE TIME Q

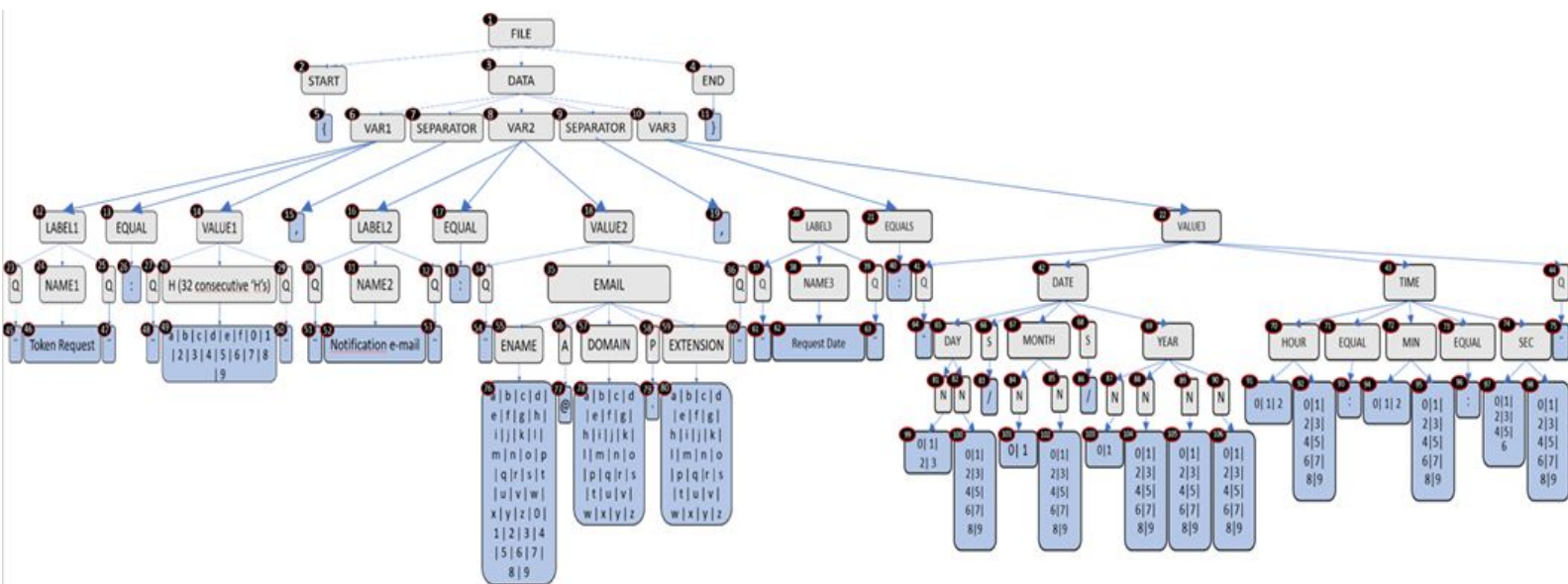
DATE ::= DAY S MONTH S YEAR

$$S ::= /$$

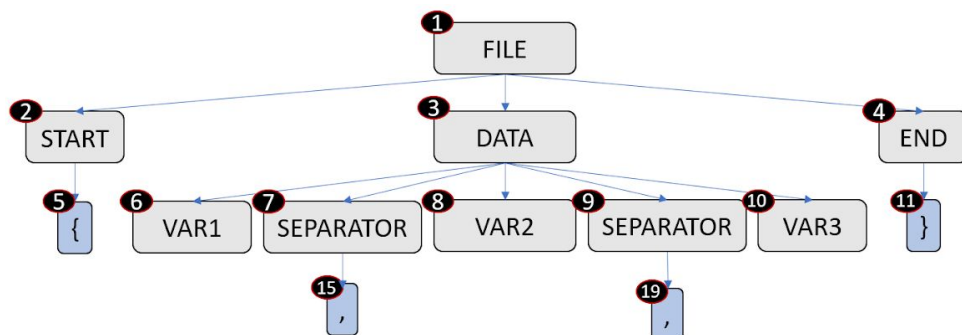
DAY ::= 0 NUMBERS | 1 NUMBERS | 2 NUMBERS | 30 | 31

MONTH ::= 0 NUMBERS | 10 | 11 | 12
 YEAR ::= 1 NUMBERS NUMBERS NUMBERS |
 2 NUMBERS NUMBERS NUMBERS
 TIME ::= HOUR EQUALS MINSEC EQUALS MINSEC
 HOUR ::= 0 NUMBERS | 1 NUMBERS | 21 | 22 | 23
 MINSEC ::= 0 NUMBERS | 1 NUMBERS | 2 NUMBERS | 3 NUMBERS |
 4 NUMBERS | 5 NUMBERS
 }

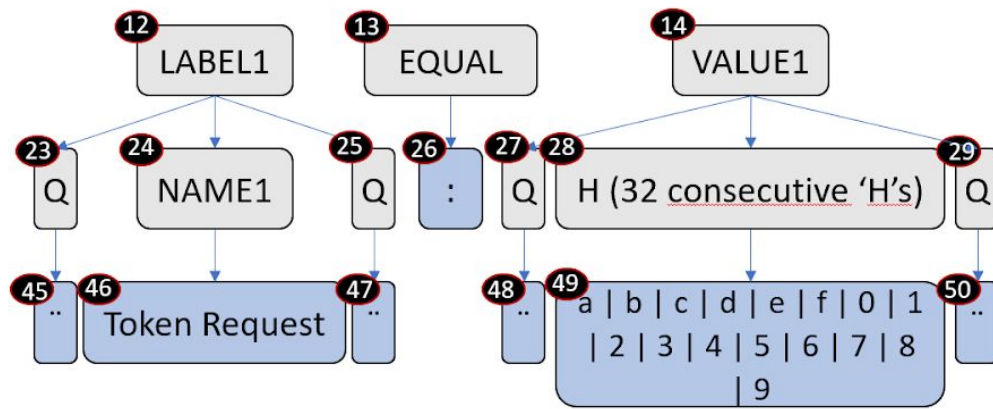
2.-Derivation Tree:



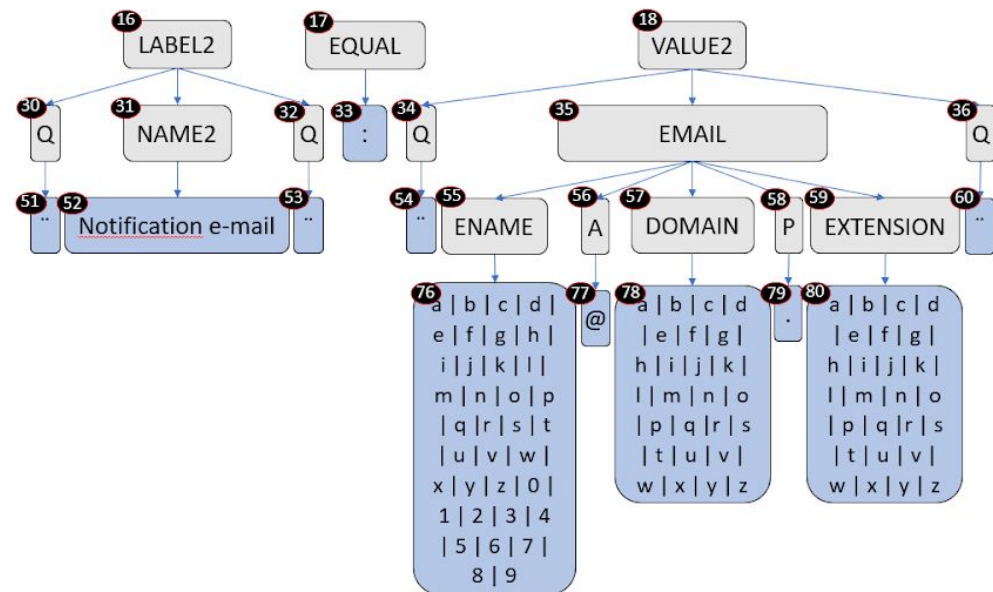
-Root:



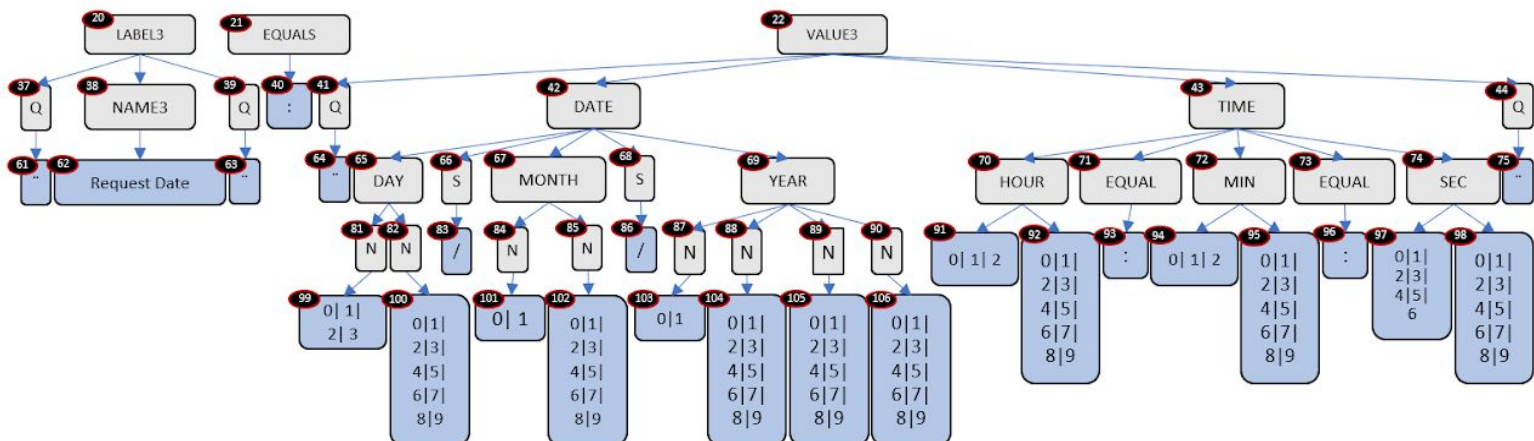
-VAR1:



-VAR2:



-VAR3:



Non-Terminal Nodes:	1, 2, 3, 4, 6, 7, 8, 9, 10, 12, 13, 14, 16, 17, 18, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39, 41, 42, 43, 44, 55, 56, 57, 58, 59, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 81, 82, 84, 85, 87, 88, 89, 90
Terminal Nodes:	5, 11, 15, 19, 26, 33, 40, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 60, 61, 62, 63, 64, 75, 76, 77, 78, 79, 80, 83, 86, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106

3.-Selection of Test Cases:

Test Case ID	Input Parameters	Covered Nodes
AS-FR2-V-01	Result: File Exists Detail: All terminal nodes covered with valid cases Input: { "Token Request":"abcdef0123456789",	5, 11, 15, 19, 26, 33, 40, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 60, 61, 62, 63, 64, 75, 76, 77,

	"Notification e-mail":"autonomous@vehicle.com", "Request Date":"24/03/2020 13:55:23" }	78, 79, 80, 83, 86, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106
AS-FR2-NV-00	Detail: Non-Terminal 1 omission Input:	All terminals + non-terminals
AS-FR2-NV-01	Detail: Non-Terminal 2 omission Input: "Token Request":"abcdef0123456789", "Notification e-mail":"autonomous@vehicle.com", "Request Date":"24/03/2020 13:55:23" }	2, 5
AS-FR2-NV-02	Detail: Non-Terminal 2 repetition Input: { "Token Request":"abcdef0123456789", "Notification e-mail":"autonomous@vehicle.com", "Request Date":"24/03/2020 13:55:23" }	2, 5
AS-FR2-NV-03	Detail: Non-Terminal 3 omission Input: { }	6, 7, 8, 9, 10, 12, 13, 14, 16, 17, 18, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39, 41, 42, 43, 44, 55, 56, 57, 58, 59, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 81, 82, 84, 85, 87, 88, 89, 90, 15, 19, 26, 33, 40, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 60, 61, 62, 63, 64, 75, 76, 77, 78, 79, 80, 83, 86, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103,

		104, 105, 106
AS-FR2-NV-04	Detail: Non-Terminal 3 repetition Input: <pre>{ "Token Request": "abcdef0123456789", "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/2020 13:55:23" }</pre>	6, 7, 8, 9, 10, 12, 13, 14, 16, 17, 18, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39, 41, 42, 43, 44, 55, 56, 57, 58, 59, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 81, 82, 84, 85, 87, 88, 89, 90, 15, 19, 26, 33, 40, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 60, 61, 62, 63, 64, 75, 76, 77, 78, 79, 80, 83, 86, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106
AS-FR2-NV-05	Detail: Non-Terminal 6 omission Input: <pre>{ , "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/2020 13:55:23" }</pre>	6, 12, 13, 14, 23, 24, 25, 26, 27, 28, 29, 45, 46, 47, 48, 49, 50
AS-FR2-NV-06	Detail: Non-Terminal 6 repetition Input: <pre>{ "Token Request": "abcdef0123456789" "Token Request": "abcdef0123456789", "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/2020 13:55:23" }</pre>	
AS-FR2-NV-07	Detail: Non-Terminal 7 omission Input: <pre>{ "Token Request": "abcdef0123456789" "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/2020 13:55:23" }</pre>	
AS-FR2-NV-08	Detail: Non-Terminal 7 repetition	

	Input: { "Token Request":"abcdef0123456789",, "Notification e-mail":"autonomous@vehicle.com", "Request Date":"24/03/2020 13:55:23" }	
AS-FR2-NV-09	Detail: Non-Terminal 12 omission Input: { "": "abcdef0123456789", "Notification e-mail":"autonomous@vehicle.com", "Request Date":"24/03/2020 13:55:23" }	
AS-FR2-NV-010	Detail: Non-Terminal 12 repetition Input: { "Token Request" "Token Request":"abcdef0123456789", "Notification e-mail":"autonomous@vehicle.com", "Request Date":"24/03/2020 13:55:23" }	
AS-FR2-NV-011	Detail: Non-Terminal 13 omission Input: { "Token Request" "abcdef0123456789", "Notification e-mail":"autonomous@vehicle.com", "Request Date":"24/03/2020 13:55:23" }	
AS-FR2-NV-012	Detail: Non-Terminal 13 repetition Input: { "Token Request": "abcdef0123456789", "Notification e-mail":"autonomous@vehicle.com", "Request Date":"24/03/2020 13:55:23" }	
AS-FR2-NV-013	Detail: Non-Terminal 14 omission Input: { "Token Request":, "Notification e-mail":"autonomous@vehicle.com", "Request Date":"24/03/2020 13:55:23" }	
AS-FR2-NV-014	Detail: Non-Terminal 14 repetition Input: { "Token Request": "abcdef0123456789" "abcdef0123456789", "Notification e-mail":"autonomous@vehicle.com", "Request Date":"24/03/2020 13:55:23" }	
AS-FR2-NV-015	Detail: Non-Terminal 23 omission Input:	

	<pre>{ "Token Request": "abcdef0123456789", "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/2020 13:55:23" }</pre>	
AS-FR2-NV-016	Detail: Non-Terminal 23 repetition Input: <pre>{ ""Token Request": "abcdef0123456789", "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/2020 13:55:23" }</pre>	
AS-FR2-NV-017	Detail: Non-Terminal 24 omission Input: <pre>{ """: "abcdef0123456789", "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/2020 13:55:23" }</pre>	
AS-FR2-NV-018	Detail: Non-Terminal 24 repetition Input: <pre>{ "Token RequestToken Request": "abcdef0123456789", "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/2020 13:55:23" }</pre>	
AS-FR2-NV-019	Detail: Terminal 26 modification Input: <pre>{ "Token Request"/"abcdef0123456789", "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/2020 13:55:23" }</pre>	
AS-FR2-NV-020	Detail: Non-Terminal 28 omission Input: <pre>{ "Token Request": "", "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/2020 13:55:23" }</pre>	
AS-FR2-NV-021	Detail: Non-Terminal 35 omission Input: <pre>{ "Token Request": "abcdef0123456789", "Notification e-mail": "", "Request Date": "24/03/2020 13:55:23" }</pre>	
AS-FR2-NV-022	Detail: Non-Terminal 35 repetition Input: <pre>{</pre>	

	"Token Request": "abcdef0123456789", "Notification e-mail": "autonomous@vehicle.comautonomous@vehicle.com" , "Request Date": "24/03/2020 13:55:23" }	
AS-FR2-NV-023	Detail: Non-Terminal 42 omission Input: { "Token Request": "abcdef0123456789", "Notification e-mail": "autonomous@vehicle.com", "Request Date": "13:55:23" }	
	Detail: Non-Terminal 42 repetition Input: { "Token Request": "abcdef0123456789", "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/202024/03/2020 13:55:23" }	
	Detail: Non-Terminal 43 omission Input: { "Token Request": "abcdef0123456789", "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/2020" }	
	Detail: Non-Terminal 43 repetition Input: { "Token Request": "abcdef0123456789", "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/2020 13:55:2313:55:23" }	
	Detail: Terminal 45 modification Input: { "Token Request": "abcdef0123456789", "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/2020 13:55:23" }	
	Result: Terminal 46 modification Detail: All terminal nodes covered with valid cases Input: { "Token Request": "abcdef0123456789", "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/2020 13:55:23" }	
	Detail: Terminal 49 modification	

	Input: { "Token Request": "abcdef01234%6789", "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/2020 13:55:23" }	
	Detail: Terminal 52 modification Input: { "Token Request": "abcdef0123456789", "Notification email": "autonomous@vehicle.com", "Request Date": "24/03/2020 13:55:23" }	
	Detail: Non-Terminal 55 omission Input: { "Token Request": "abcdef0123456789", "Notification e-mail": "@vehicle.com", "Request Date": "24/03/2020 13:55:23" }	
	Detail: Non-Terminal 56 omission Input: { "Token Request": "abcdef0123456789", "Notification e-mail": "autonomousvehicle.com", "Request Date": "24/03/2020 13:55:23" }	
	Detail: Non-Terminal 56 repetition Input: { "Token Request": "abcdef0123456789", "Notification e-mail": "autonomous@@vehicle.com", "Request Date": "24/03/2020 13:55:23" }	
	Detail: Non-Terminal 57 omission Input: { "Token Request": "abcdef0123456789", "Notification e-mail": "autonomous@.com", "Request Date": "24/03/2020 13:55:23" }	
	Detail: All terminal nodes covered with valid cases Input: { "Token Request": "abcdef0123456789", "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/2020 13:55:23" }	
	Detail: All terminal nodes covered with valid cases Input:	

	<pre>"Token Request": "abcdef0123456789", "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/2020 13:55:23" }</pre>	
	<p>Detail: All terminal nodes covered with valid cases</p> <p>Input:</p> <pre>{ "Token Request": "abcdef0123456789", "Notification e-mail": "autonomous@vehicle.com", "Request Date": "24/03/2020 13:55:23" }</pre>	