2.2.1

DATA TYPES

1. Data types and sizes
2. Literals
3. Declarations (Pseudocode and Language)
4. Identifiers (Naming conventions)
5. Assignment
6. Constants/Constructs.

identifier

Data Type	Sizes (Bytes)	Literals (Example)	Declaration (Pseudocode)
INTEGER	4	2, -3, +5	DECLARE examMarks : INTEGER
REAL	4	0.0, -2.35, +5.75	DECLARE examFee : REAL
CHAR	1	'a', 'U', 'B'	DECLARE grade : CHAR
STRING	As required	"SKH Solution"	DECLARE stuName : STRING
BOOLEAN	1	#TRUE#, #FALSE#	DECLARE IsexamPassed : Boolean
DATE	8	# 02-10-16#	DECLARE DOB : DATE
CURRENCY	8	10.25	DECLARE AmountPaid : CURRENCY

In a Language like VB.net declarations are done differently. This vary Language to Language but does the same.

E.g: DIM examMarks AS INTEGER.

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IDENTFIER: A name given to a variable, function, procedure or a program

NAMING CONVENTIONS:

- Always start with alphabet or underscore. Like Name1, _Grade
- Don't use special characters or spaces. Like N#me, sch####l, Stu Name
- Don't use KEYWORDS.
- Name length upto 255 characters

Assignment (= , ←):

When a value is assigned to a variable, an assignment symbol is used. Assignment is always done "right to left" and otherwise it is incorrect.

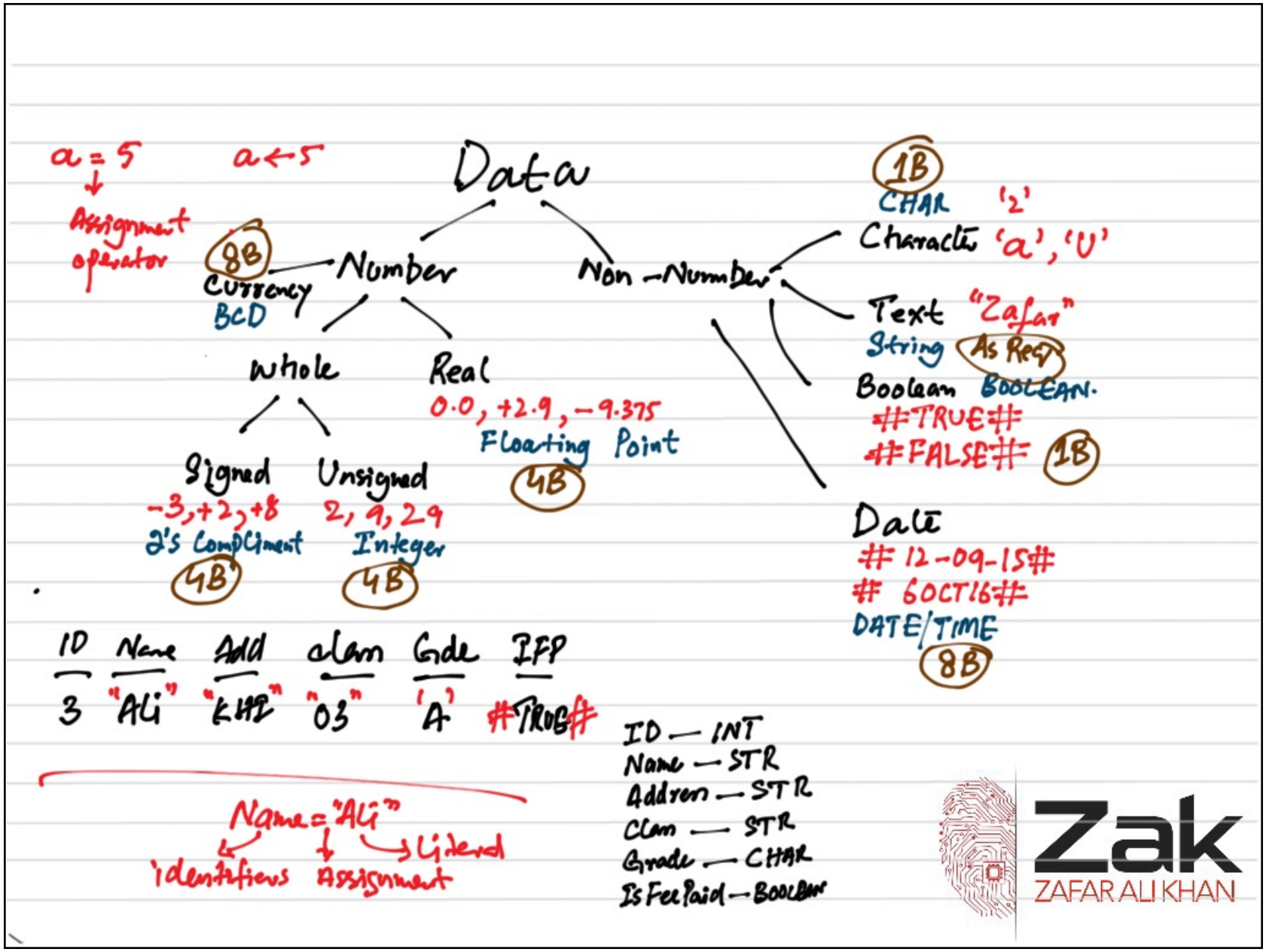
a = 5 is correct

5 = a is incorrect.

Name ← "Solutions"

examMarks = 25

← symbol is used in pseudocodes, where as = sign is used in Languages.


a = 5
Assignment operator
a ← 5
Data
Number
Non-Number
8B
Currency
BCD
Whole
Real
0.0, +2.9, −9.375
Floating Point
4B
Signed
−3, +2, +8
2's Compliment
4B
Unsigned
2, 9, 29
Integer
4B
1B
CHAR '2'
Character 'a', 'U'
Text "Zafar"
String
As Req
Boolean BOOLEAN.
#TRUE#
#FALSE#
1B
Date
12-09-15#
6OCT16#
DATE/TIME
8B
ID Name Add Clan Gde IFP
3 "Ali" "KHI" "03" 'A' #TRUE#
ID — INT
Name — STR
Address — STR
Clan — STR
Grade — CHAR
Is Fee Paid — BOOLEAN
Name = "Ali"
Identifiers
Assignment
Literal
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CONSTANTS:

Held memory locations which once made can't be changed.

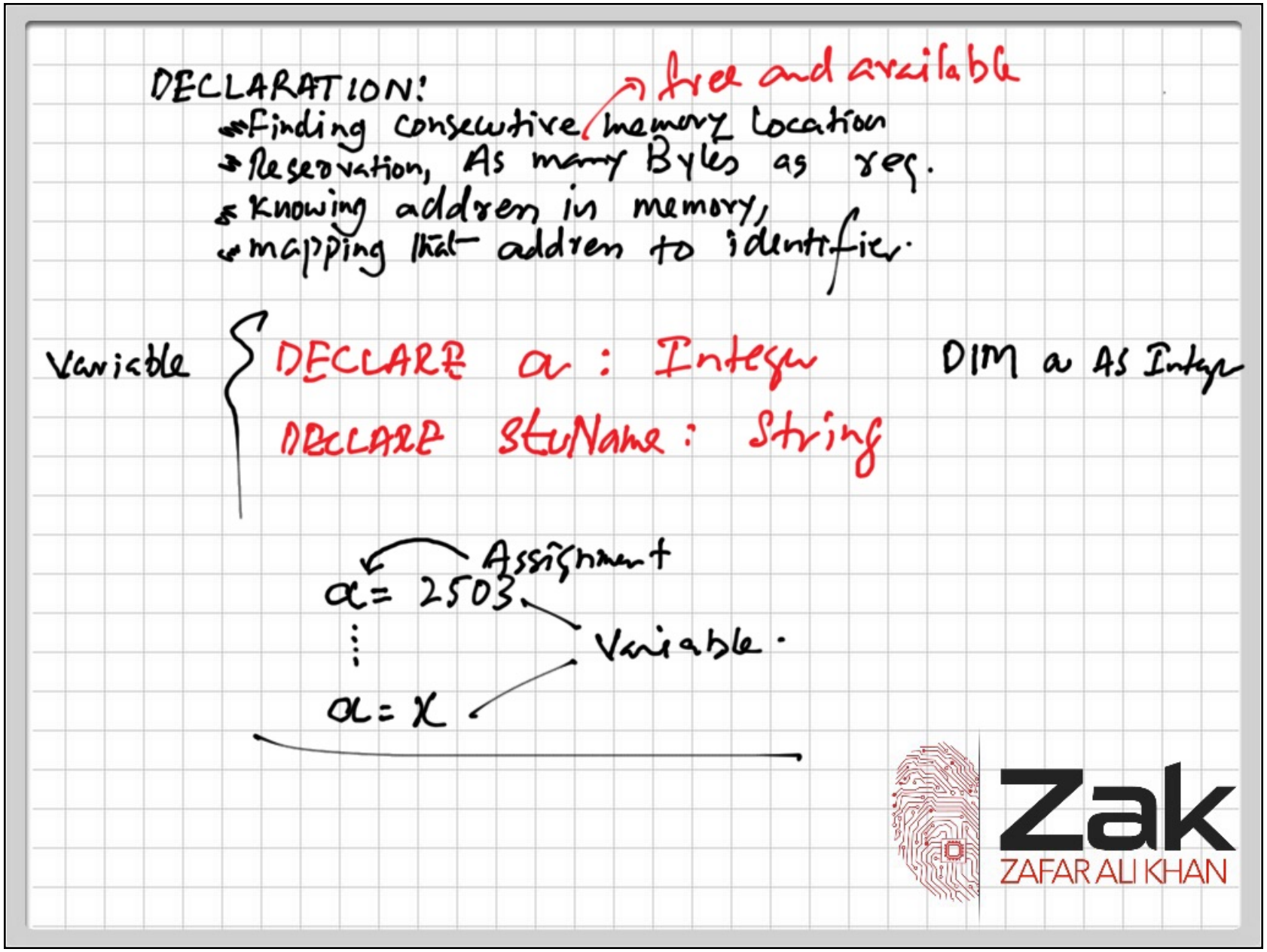
These are used when at the start of the program a programmer is sure that this particular value will be always constant during the execution program.

E.g:

TaxRate, Pi etc.

Pseudocode: Constant taxRate = 23.75

Visual Basic: Const taxRate = 23.75


DECLARATION:
free and available
Finding consecutive memory location
Reservation, As many Bytes as req.
Knowing addres in memory,
mapping that addres to identifier.
Variable
DECLARE a : Integer
DIM a AS Integer
DECLARE stuName : String
Assignment
a = 2503
Variable.
a = X
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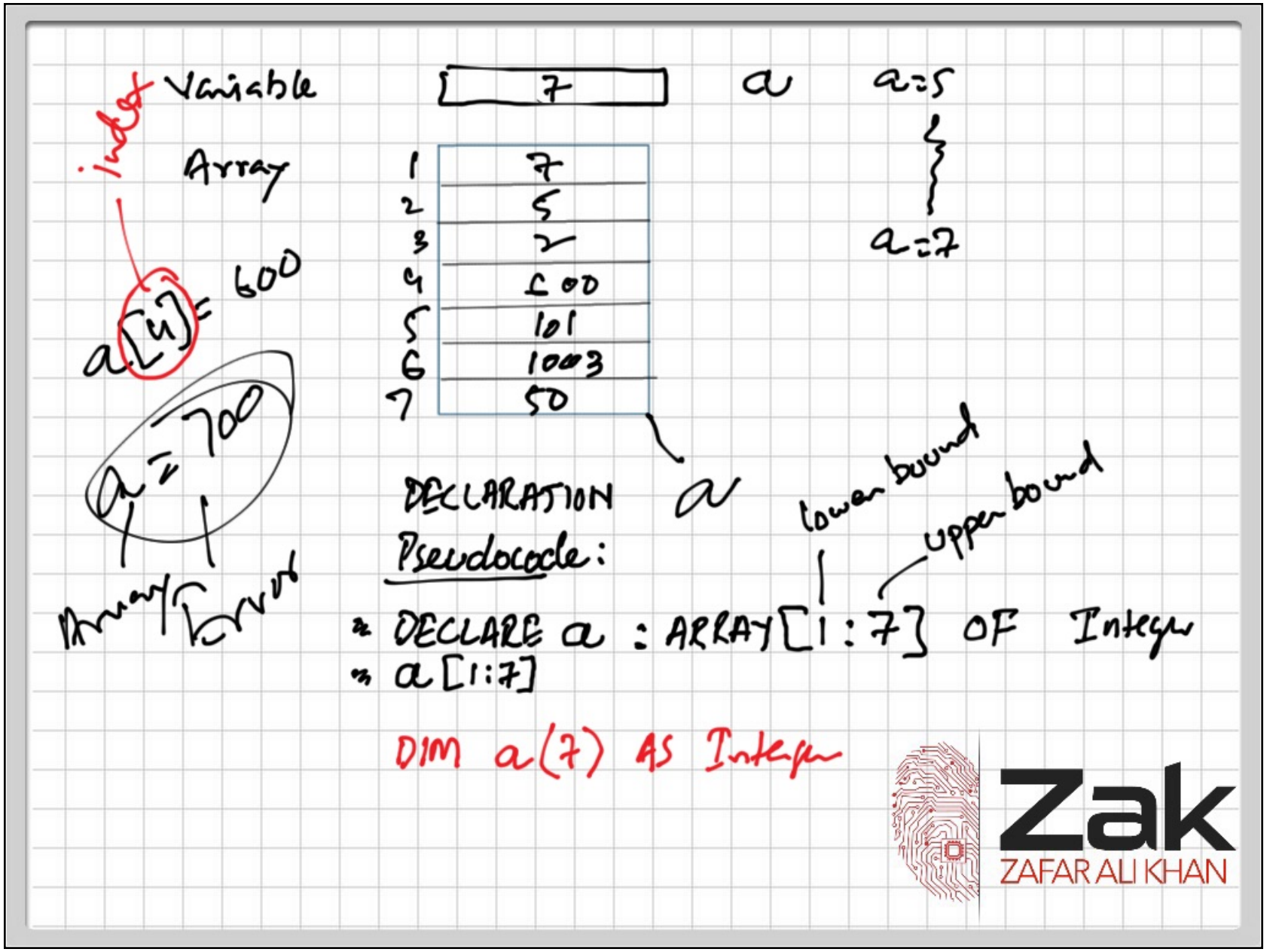
Variable
Array
index
a[4] = 600
a = 700
Array Name
7
a
a=5
a=7
1 7
2 5
3 2
4 600
5 101
6 1003
7 50
DECLARATION
a
Pseudocode:
lower bound
upper bound
DECLARE a : ARRAY[1:7] OF Integer
a[1:7]
DIM a(7) AS Integer
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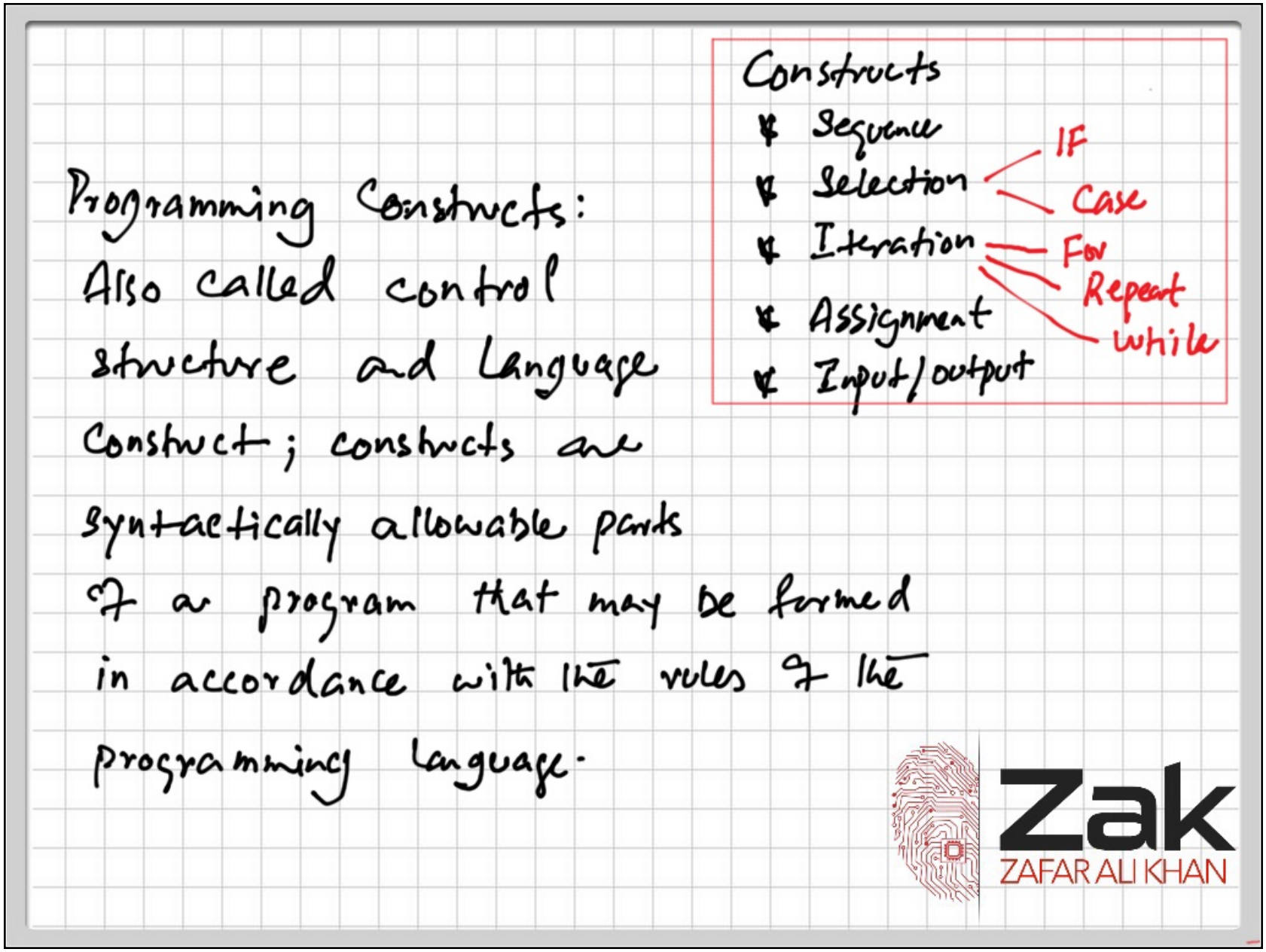
Programming Constructs:
Also called control structure and Language Construct; constructs are syntactically allowable parts of a program that may be formed in accordance with the rules of the programming Language.
Constructs
Sequence
Selection
Iteration
Assignment
Input/output
IF
Case
For
Repeat
While
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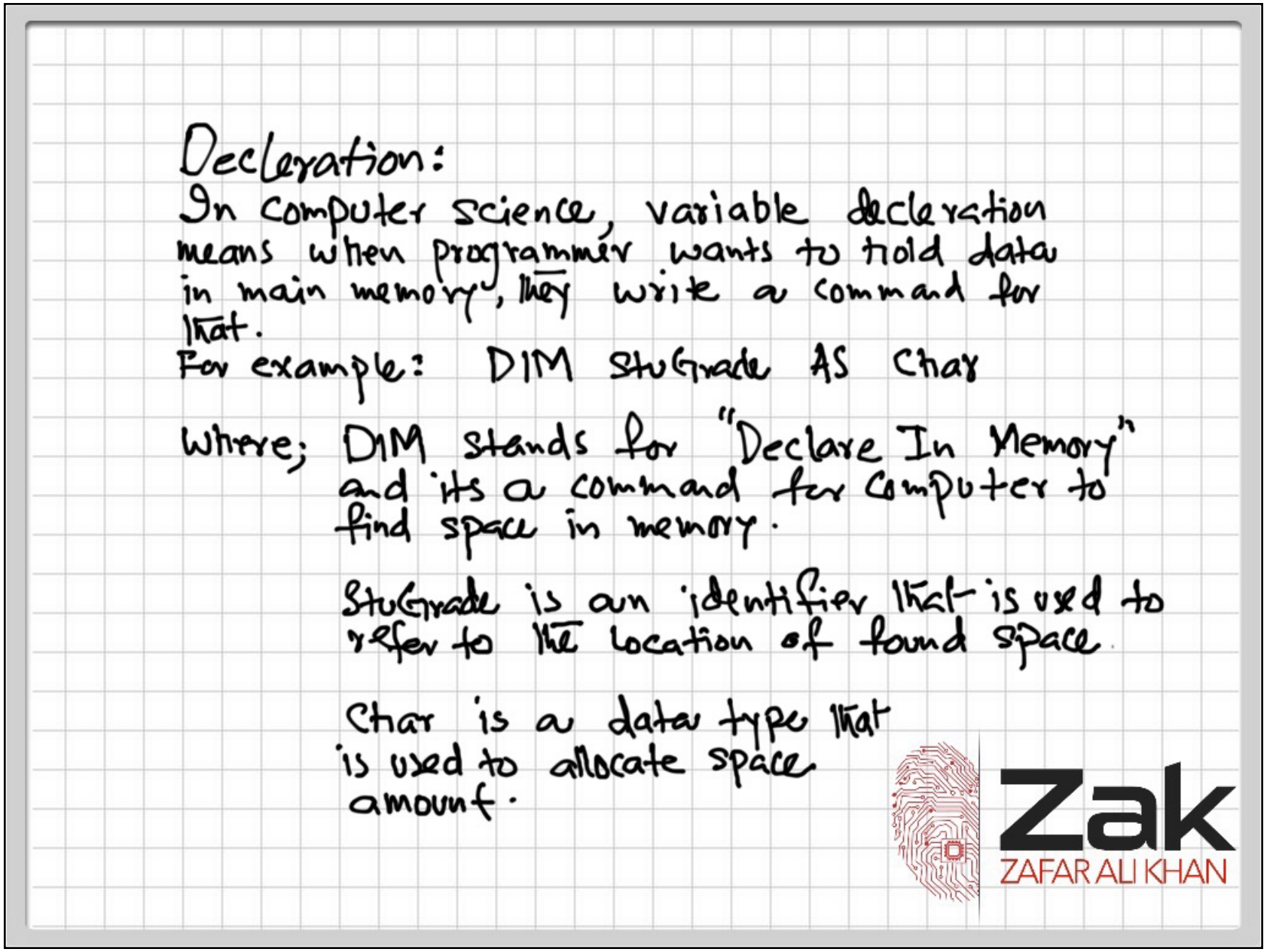
Declaration:
In computer science, variable declaration means when programmer wants to hold data in main memory, they write a command for that.
For example: DIM StuGrade AS Char
Where; DIM stands for "Declare In Memory" and its a command for computer to find space in memory.
StuGrade is an identifier that is used to refer to the location of found space.
Char is a data type that is used to allocate space amount.
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DECLARATION:

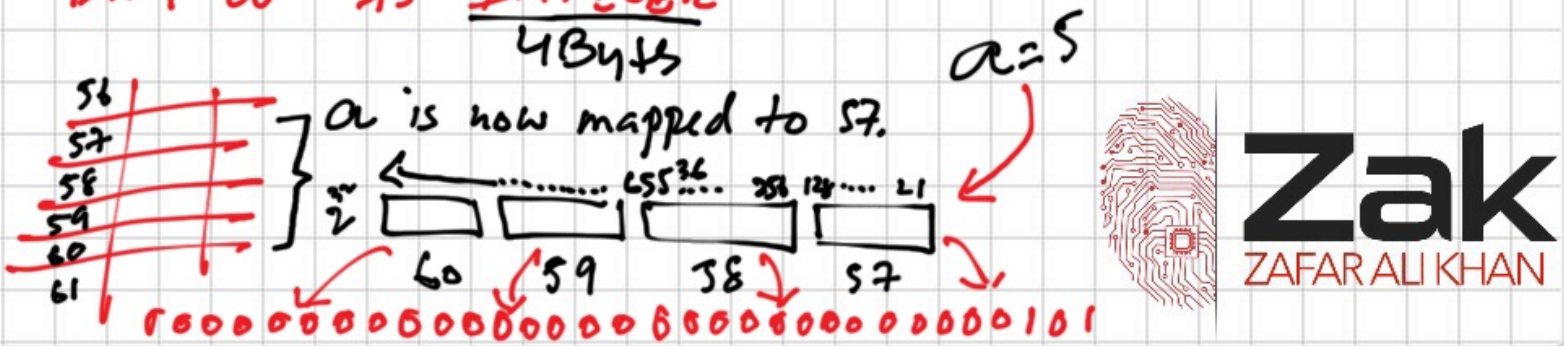
a. Finds enough space in RAM and holds it as reserved untill the current program is executed.

b. It makes sure that data that is being assigned to the reserved space is as per the defined format.

c. It maps the reserved space addresn to the chosen identifier. So that assignments can workout easily.

DIM a AS INTEGER

4Bytes



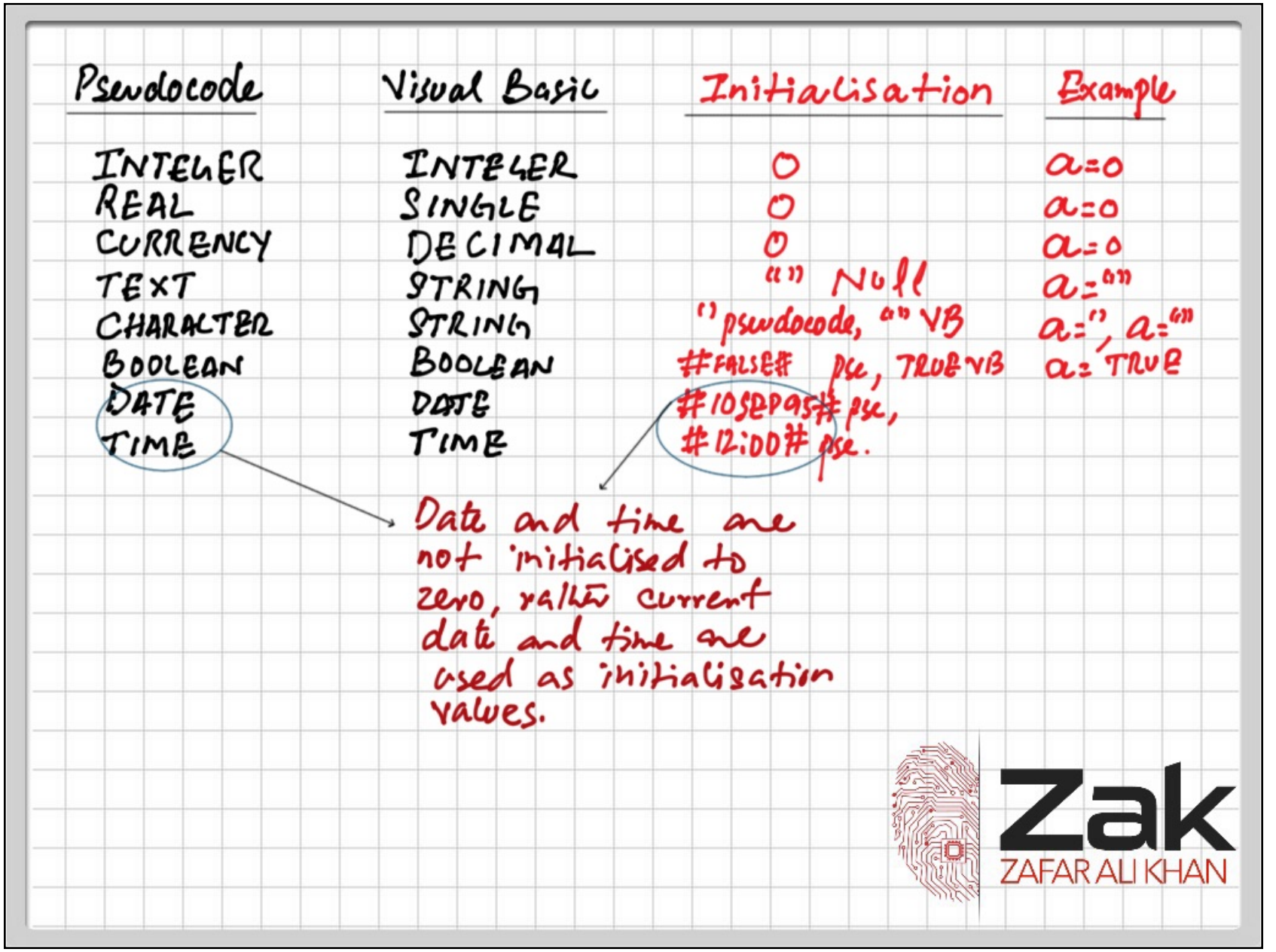
INITIALISATION:

Whenever a new variable is declared, it occupies some space in computer's main memory.

This occupied space might already have some data from the previous program loaded there. This already present data is then automatically assigned to the newly created variable and regarded as "garbage".

This garbage data is unwanted and needs to be removed.

The removal of garbage data before actually using the variable is called Initialisation.


Pseudocode
Visual Basic
Initialisation
Example
INTEGER
REAL
CURRENCY
TEXT
CHARACTER
BOOLEAN
DATE
TIME
INTEGER
SINGLE
DECIMAL
STRING
STRING
BOOLEAN
DATE
TIME
0
0
0
"" Null
" " pseudocode, "" VB
#FALSE# pse, TRUE VB
#10SEP95# pse,
#12:00# pse.
a=0
a=0
a=0
a=""
a=", a=""
a= TRUE
Date and time are not initialised to zero, rather current date and time are used as initialisation values.
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