

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.

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

identifier

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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IDENTIFIER: 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

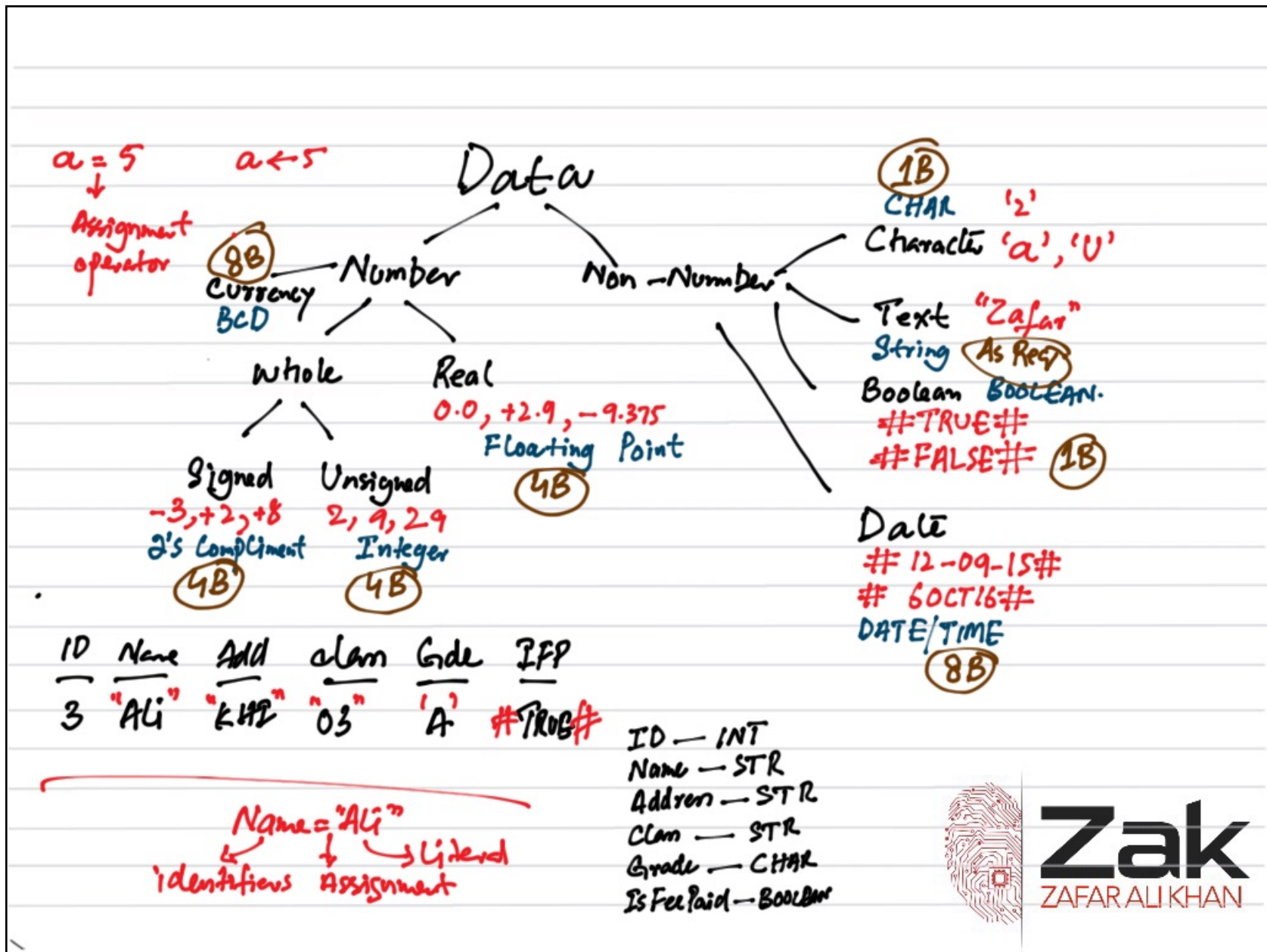
5 = a is incorrect.

Name ← "Solutions"

examMarks = 25

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





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



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DECLARATION: → free and available

- Finding consecutive memory location
- Reservation, As many Bytes as req.
- Knowing address in memory,
- mapping that address to identifier.

Variable { DECLARE a : Integer DIM a AS Integer
DECLARE stuName : String

Assignment
 a = 2503
 ⋮
 a = x
Variable



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Variable

Array

index

$a[4] = 600$

$a = 700$

lower bound

upper bound

1	7
2	5
3	2
4	600
5	101
6	1003
7	50

DECLARATION Pseudocode:

2 DECLARE a : ARRAY[1:7] OF Integer

3 $a[1:7]$

$\text{DIM } a(7) \text{ AS Integer}$

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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
 - IF
 - Case
- ✦ Iteration
 - For
 - Repeat
 - while
- ✦ Assignment
- ✦ Input/output



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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 it's a command for computer to find space in memory.

StuGrade is an identifier that is used to refer to the location of found space.

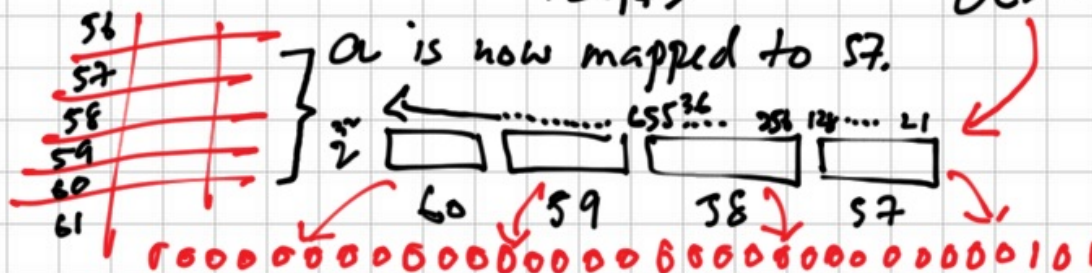
Char is a data type that is used to allocate space amount.



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- Finds enough space in RAM and holds it as reserved until the current program is executed.
- It makes sure that data that is being assigned to the reserved space is as per the defined format.
- It maps the reserved space address to the chosen identifier. So that assignments can work out easily.

4 Bytes

 $a=5$ 

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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**.



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Pseudocode	Visual Basic	Initialisation	Example
INTEGER	INTEGER	0	a=0
REAL	SINGLE	0	a=0
CURRENCY	DECIMAL	0	a=0
TEXT	STRING	" " Null	a=""
CHARACTER	STRING	" pseudocode, " VB	a=" ", a=""
BOOLEAN	BOOLEAN	#FALSE# pse, TRUE VB	a=TRUE
DATE	DATE	#10SEP95# pse,	
TIME	TIME	#12:00# pse.	

Date and time are not initialised to zero, rather current date and time are used as initialisation values.



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