Fakultas Informatika
School of Computing
Telkom University

KUG1C3
Dasar Algoritma dan Pemrograman

Array Data Type

Array

- Store multiple data of the same type in a variable
- arrangement of a set of data can be accessed via an index
- Usually illustrated as a table

Multiple data of the same type

- Suppose we need to store 3 different value of integer
- For that, we define 3 variables of integer

```
dictionary
    v1 : integer
    v2 : integer
    v3 : integer
```

Multiple data of the same type

- But what if we need to store 100 different value of integer, do we need to create 100 variables?

dictionary

v1 **:** integer

v2 **:** integer

…

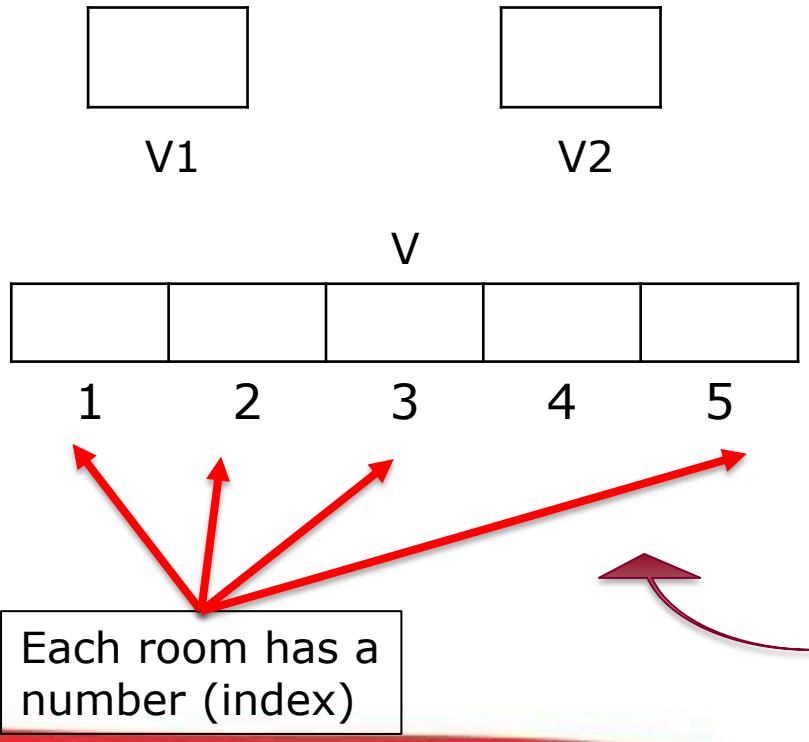
v100 : integer

Multiple data of the same type

- For this case, we can just use an array

```
dictionary
    v : array [1..100]
                of integer
```

Illustration of an Array



dictionary

v1 : integer

v2 : integer

Creating a variable is just like creating a variable

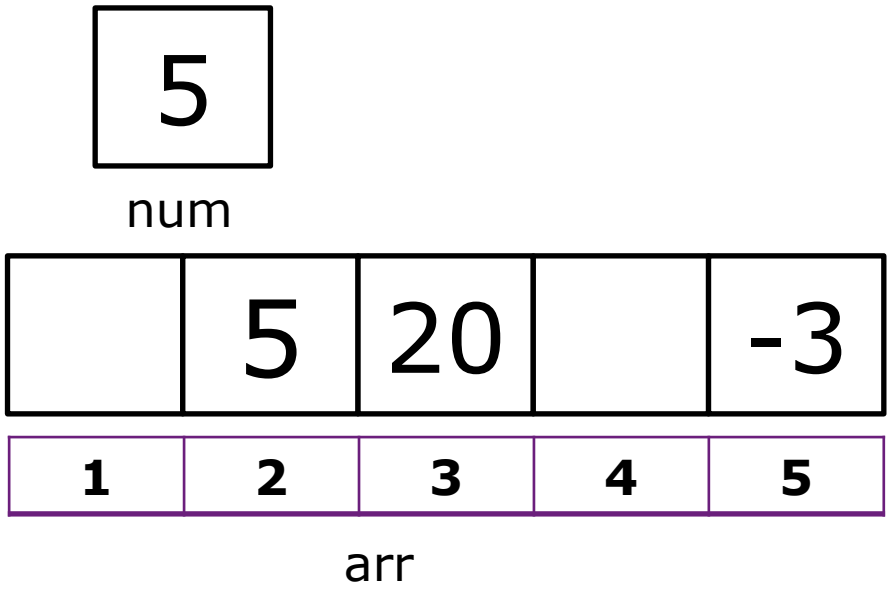
Creating an array is like creating multiple room in one variable, where each room can store one value

v : array [1..100] of integer

Using Array

- Declaring array
  - Var_name : array [start…stop] of data_type
  - Arr_int : array[1..5] of integer
  - Arr_string : array[a..z] of string
- Access array by index
  - Var_name[index]

Accessing Array



dictionary

num : integer

arr : array [1..5] of integer

algorithm

num ← 5

arr[3] ← 20

arr[2] ← num

input(arr[5])

output(arr[2]) **// output = 5**

arr[7] ← 10 **// error, room #7 not exists**

Multidimensional Array

- 1 dimensional array
  - Vector, line, string
  - Var_name : array [start…stop] of data_type
- 2 dimensional array
  - Table, matrix
  - Var_name : array [start…stop, start…stop] of data_type

Illustration of Multidimensional Array

- 2D (Matrix)

	1	2	3
1			
2			5
3			6
4	7		

```
dictionary
    tab : array[1..4,1..3] of
          integer
algorithm
    tab[2,3] ← 5
    tab[4,1] ← 7
    tab[3,3] ← tab[2,3] + 1
```

Array of Record

TABEL MAHASISWA

mhs	1	2	3	...	10
nim	01	02	03		10
nama	Abdi	Banu	Cici		Tina
nilai	A	C	B		T

1

```
type mahasiswa
    nim: array [1..10] of string;
    nama: array [1..10] of
    string;
    nilai: array [1..10] of char;
mhs: mahasiswa;
```

2

```
type mahasiswa
    nim, nama: string;
    nilai: char;
mhs: array [1..10] of
    mahasiswa;
```

3

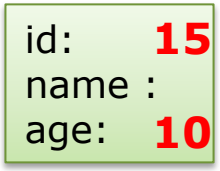
```
var
    nim: array [1..10] of string;
    nama: array [1..10] of
    string;
    nilai: array [1..10] of char;
```

Array of Record

- Array can also be used for record data type
- Suppose we want to store data of 100 students

```
Type student <
    id : string,
    name : string,
    age : integer
    >
dictionary
    tab_s : array [1..100]
        of student
```

Accessing Array of Record



s1

tab_s

student	1	2	3	...	100
id name age		 A	2		

dictionary

s1 **:** student

tab_s: array [1..100]
of student

algorithm

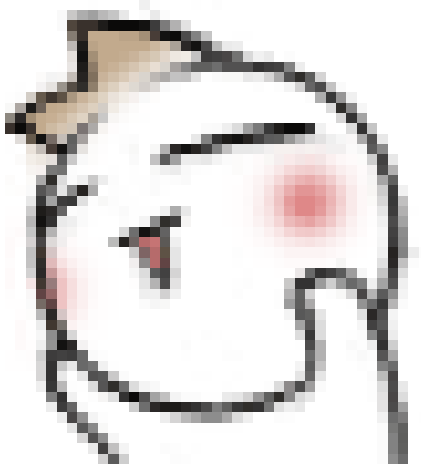
s1.age ← 10

s1.id ← 15

tab_s[2].name ← A

tab_s[3].id ← 2

Question?



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THANK YOU