SNS COLLEGE OF ENGINEE

Kurumbapalayam(Po), Coimbatore – 641 107
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Department of Artificial Intelligence an

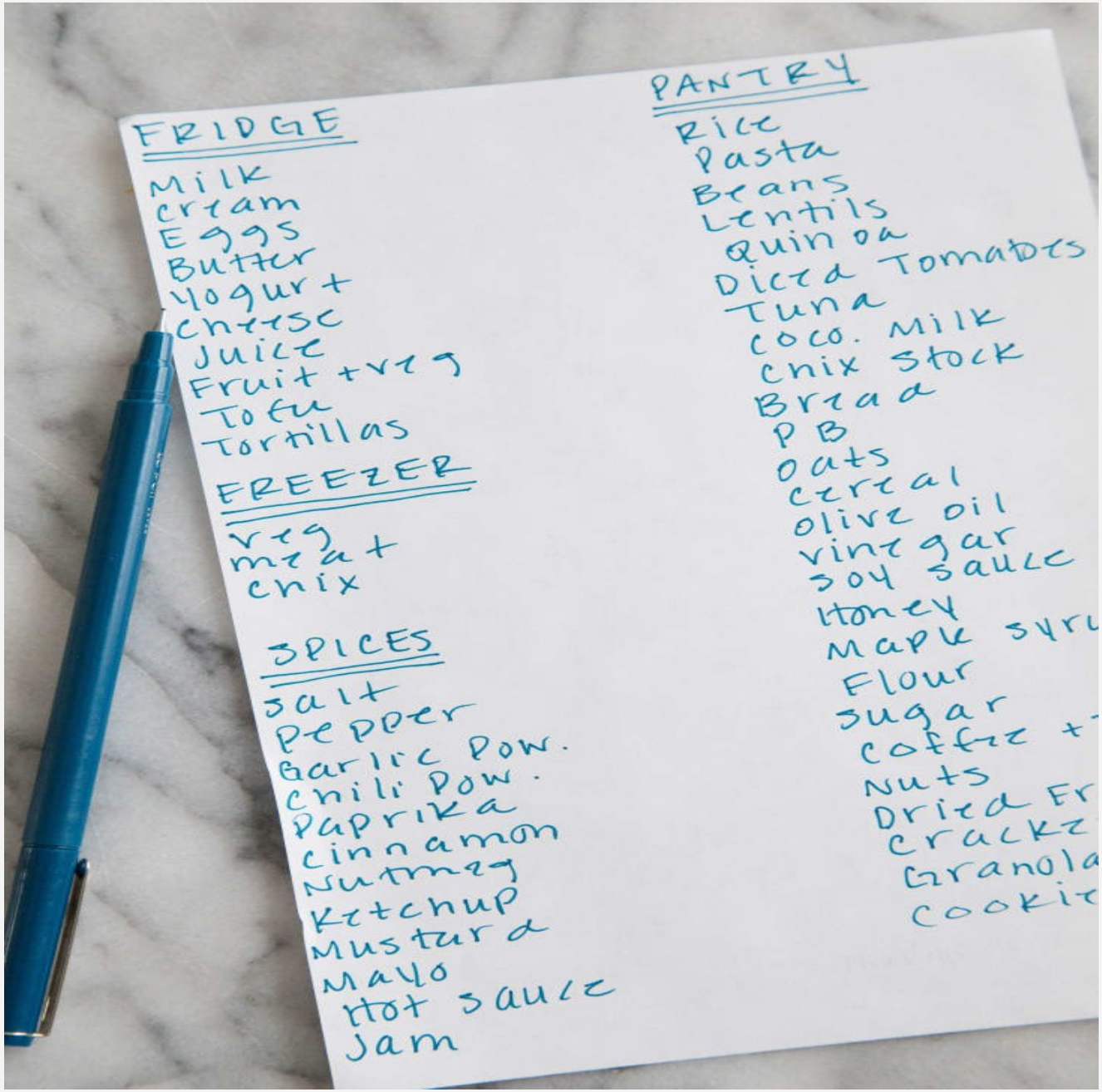
Course Name: 23ITB201 Data structures a

II Year / III semester

Unit I – List ADTs

Topic: List ADT

List ADTs


FRIDGE
Milk
cream
Eggs
Butter
Yogurt
Cheese
Juice
Fruit + veg
Tofu
Tortillas
FREEZER
veg
meat
chix
SPICES
salt
pepper
Garlic Pow.
Chili Pow.
Paprika
cinnamon
Nutmeg
Ketchup
Mustard
Mayo
Hot sauce
Jam
PANTRY
Rice
Pasta
Beans
Lentils
Quinoa
Diced Tomatoes
Tuna
coco. Milk
Chix Stock
Bread
PB
Oats
Cereal
Olive oil
vinegar
Soy sauce
Honey
Maple syru
Flour
sugar
coffee +
Nuts
Dried Fr
Crackers
Granola
Cookie

n ordered set of elements.

ral form of the list is $A_1, A_2, \ldots\ldots, A_N$

element of the list

lement of the list

f the list

nt at position i is A_i, then its successor is A_{i+1} and its predeces

Example:

10	20	30	40	50

List ADT

{

Instances: collection of elements.

Operations:

Insert ()

Delete ()

Find ()

Next (i)

Previous (i)

Print list()

Makeempty()

on of list ADT

Implementation

based implementation

nentation

ollection of specific number of same type of data stored in con

ations.

atic data structure.

10, 20, 25 -> requires 3 variables

What for 100 elements?

Array

used to hold several values in a single variable, rather th

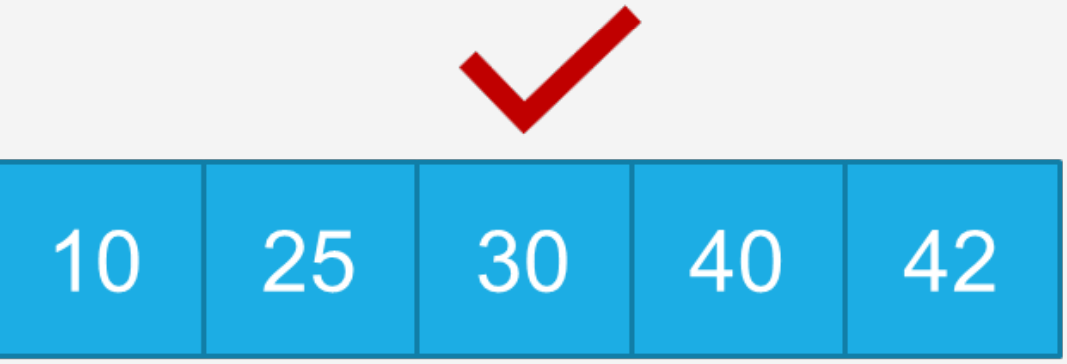
separate variables for each value.

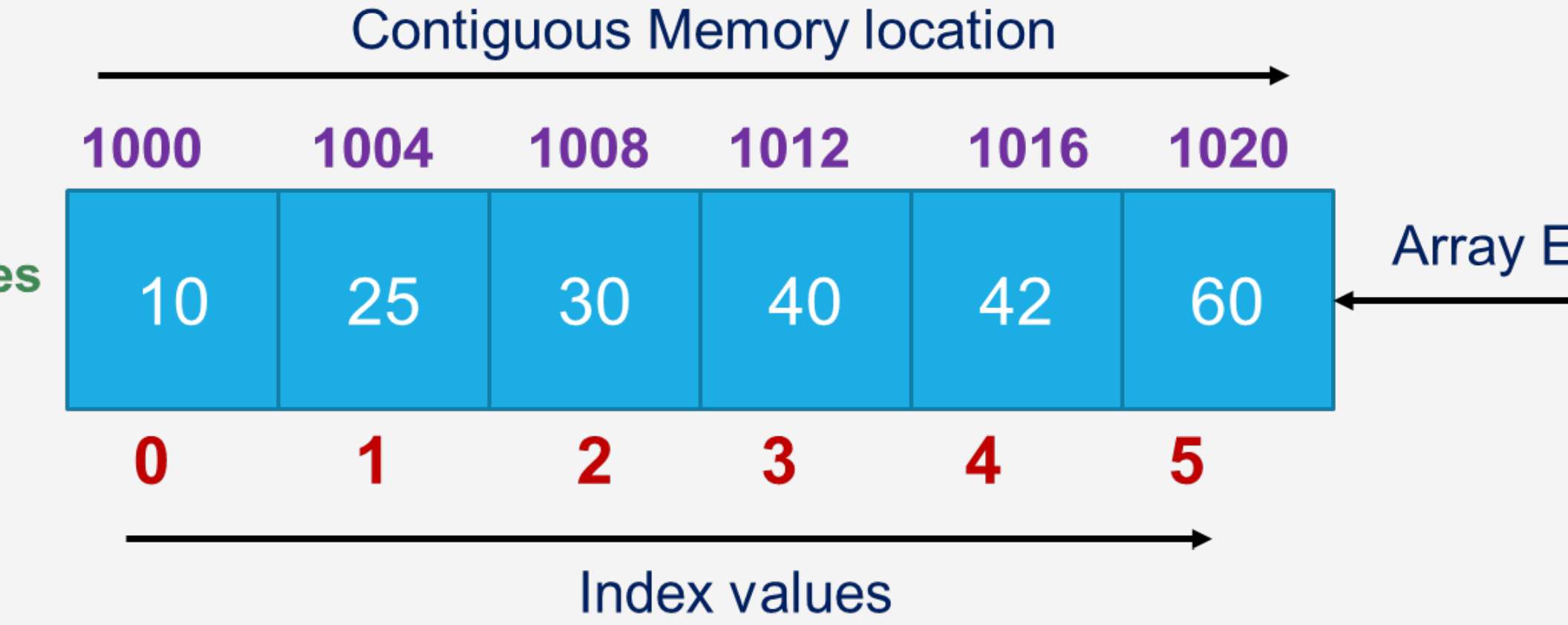
y is defined as the group of similar type of data elements

ous memory locations.

re the derived data type since it holds the primitive type

int, char, double, float, etc.

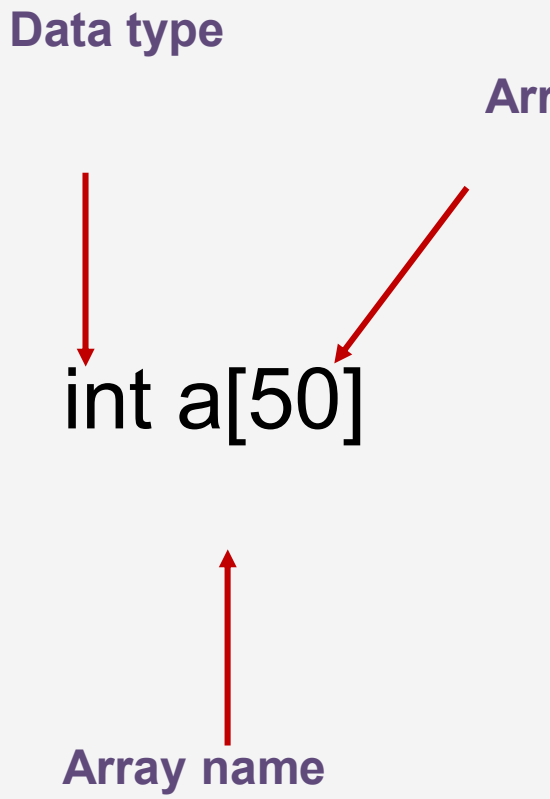



Contiguous Memory location
1000
1004
1008
1012
1016
1020
10
25
30
40
42
60
Array E
0
1
2
3
4
5
Index values

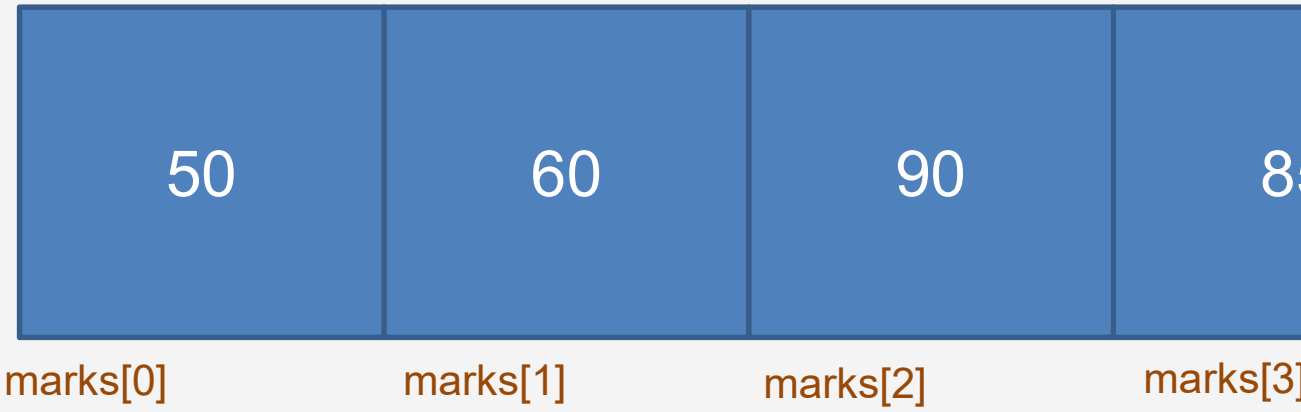
of one dimensional arrays:

ray_name[array_size];

20];

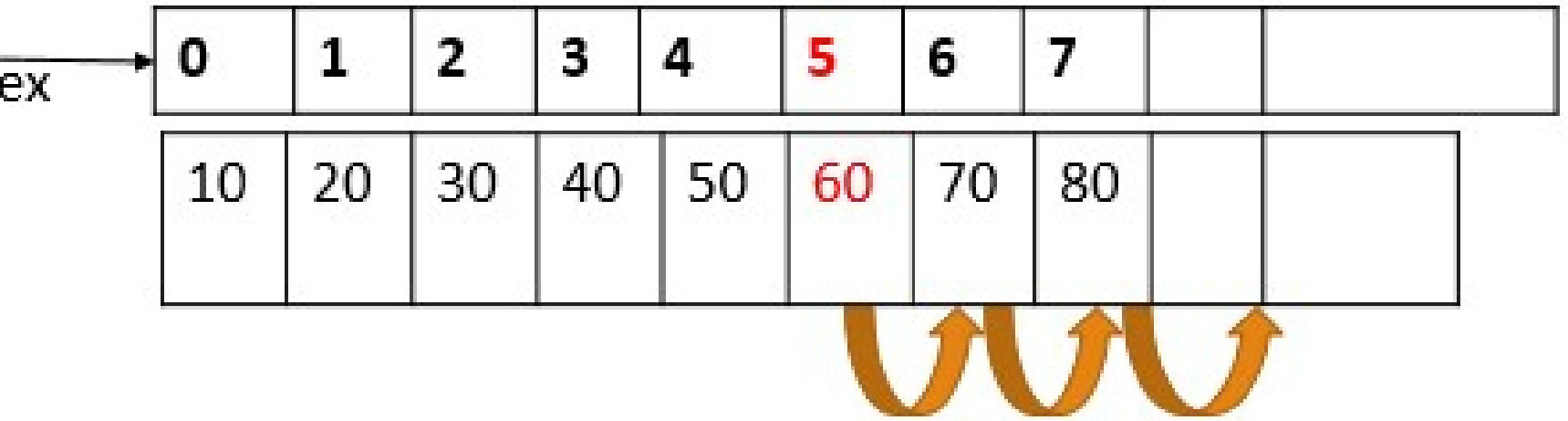


{50, 60, 90, 85, 65}



Why we need an array?

ata can be added at the beginning, end, or any given index o

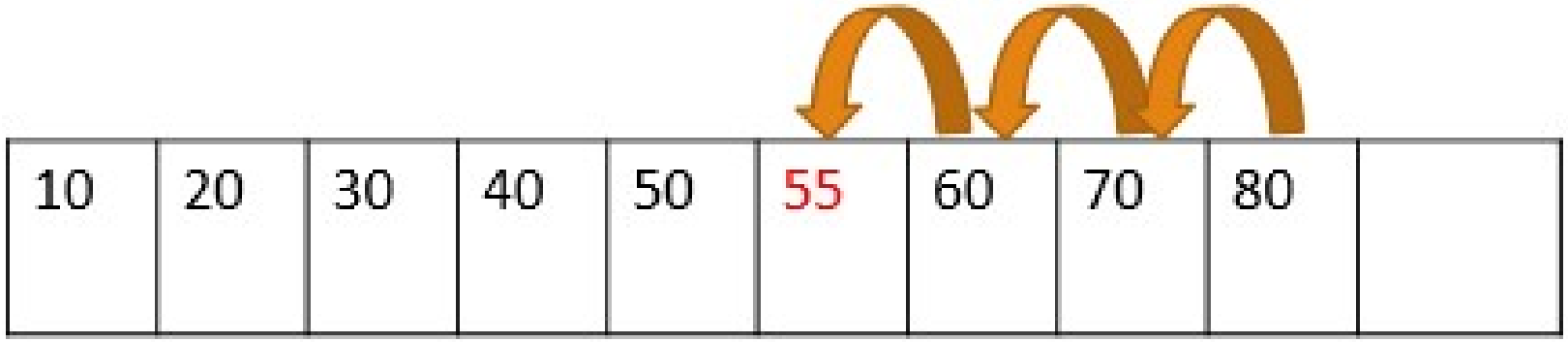


10	20	30	40	50	55	60	70	80	

```
ert()


\n Enter the number of elements:");
d",&n);
\n Enter list elements: ");
 i<n; i++)
d", &b[i]);
```

Removing an existing element from an array.



If data 55 is to be deleted from the array, then 60 has to be moved to data 5
position, 70 has to be moved to data 60 position and so on.

```
void deletion()
{
printf("\n enter the position you want to delete: ");
scanf("%d", &pos);
if(pos >= n)
printf("\n Invalid location");
else
{
for(i=pos+1; i<n; i++)
b[i-1] = b[i];
n--;
printf("List elements after deletion");
}
```

```
()

0;                                  if(flag == 0)
Enter the element to be             printf("Value %d is not in th
);                                      }
 &e);
n; i++)

e)


ment is in the %d position",
```

```
play()


 i<n; i++)
\n %d", b[i]);
```

tages of array implementation:

elements are faster to access using random access.

ching an element is easier.

tion of array implementation

number of elements in the array is fixed.

rtion and deletion operation in array are expensive.

nory is allocated at compile time i.e static memory allocation.

the array operations

at operation this code performs?

```
enter the position: ");
 &pos);
)
Invalid location");


; i<n; i++)
i];
```