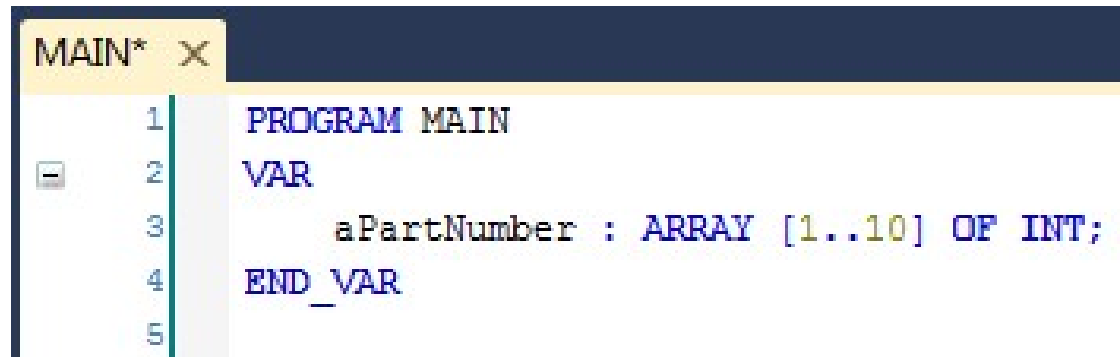


BECKHOFF



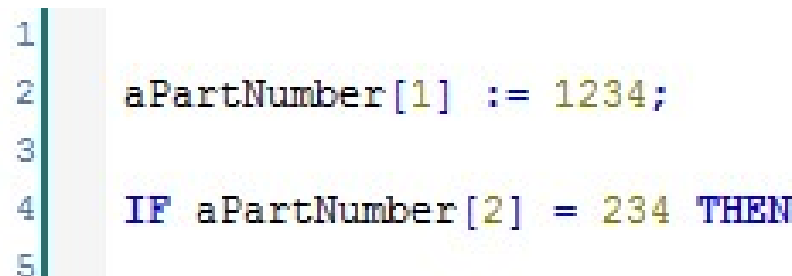
- An Array is a list of data, the data in the Array can be of any type
- An Array can contain more than one dimension
- Think of a Notebook of graph paper
- The column on a single sheet of paper would be a 1 dimensional array
- The entire sheet with its rows and columns would be a 2 dimensional array
- The Notebook with all of its sheets would be a 3 dimensional array

- 1 Dimensional Array
- The Array is defined from 1 to 10 of type INT
- This Array will hold 10 integer values



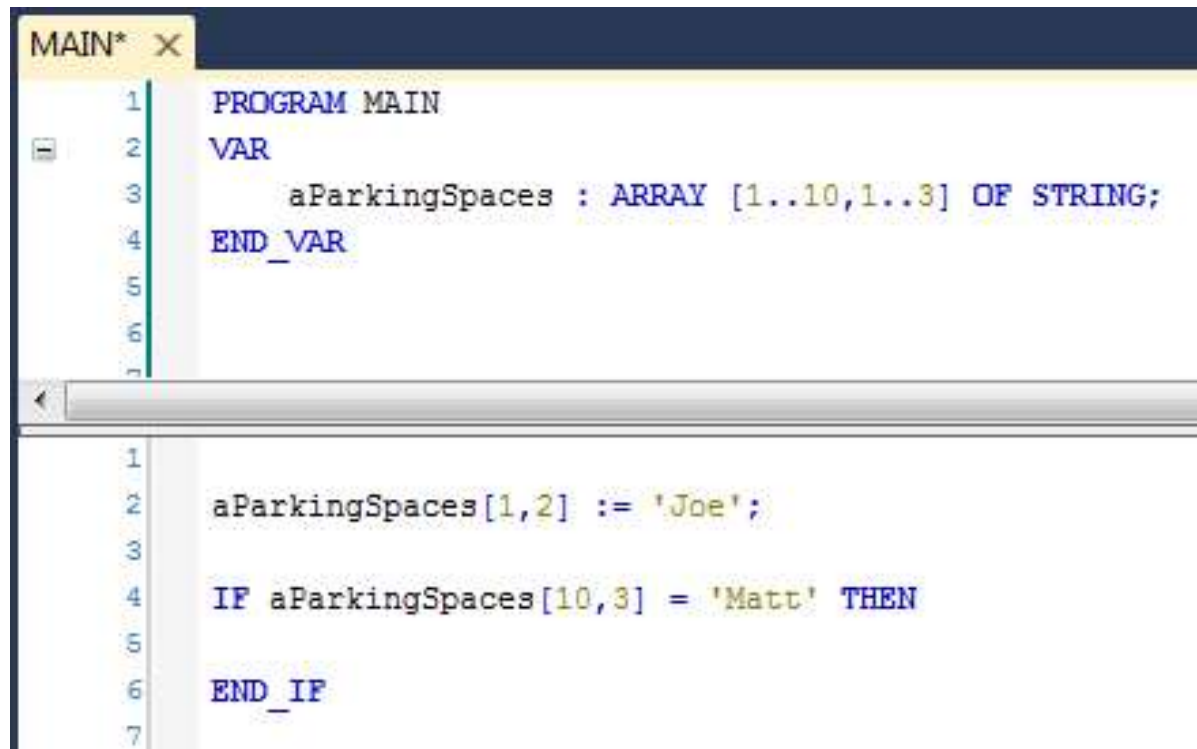
```
1 PROGRAM MAIN
2 VAR
3     aPartNumber : ARRAY [1..10] OF INT;
4 END_VAR
5
```

- The position in the Array is referred to as the index
- The Array name along with an index can be used just like any other variable



```
1
2 aPartNumber[1] := 1234;
3
4 IF aPartNumber[2] = 234 THEN
5
```

- 2 Dimensional Array
- The Array is defined from 1 to 10 and 1 to 3 of type String
- This Array will hold 30 (3×10) String values
- The comma ',' is used to denote the multiple dimensions of the array

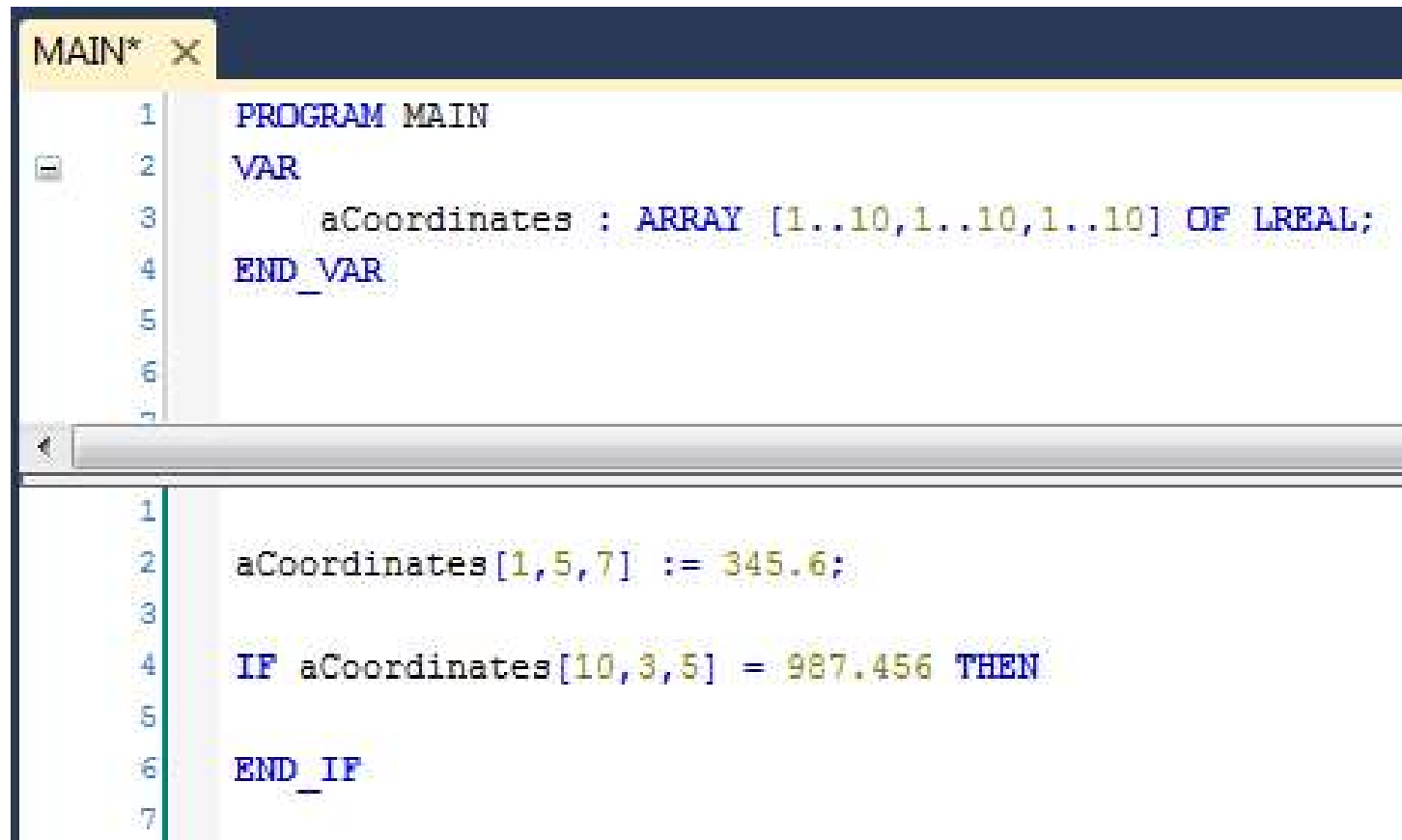


The screenshot shows a Beckhoff LAD editor window titled 'MAIN*'. The editor displays the following code:

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1 PROGRAM MAIN
2 VAR
3     aParkingSpaces : ARRAY [1..10,1..3] OF STRING;
4 END_VAR
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```
1 aParkingSpaces[1,2] := 'Joe';
2
3
4 IF aParkingSpaces[10,3] = 'Matt' THEN
5
6
7 END_IF
```

- 3 Dimensional Array



The screenshot shows a Beckhoff ladder logic editor window titled 'MAIN*'. The editor contains a program with the following code:

```
1 PROGRAM MAIN
2 VAR
3     aCoordinates : ARRAY [1..10,1..10,1..10] OF LREAL;
4 END_VAR
5
6
7
```

The code is displayed in a light blue font on a white background. The first part of the code (lines 1-4) is the variable declaration for a 3D array named 'aCoordinates' of type 'LREAL', with dimensions ranging from 1 to 10 for each axis. The second part of the code (lines 5-7) shows the array being used in an assignment and a conditional statement. The array is accessed using the syntax 'aCoordinates[x,y,z]'. The first assignment sets 'aCoordinates[1,5,7]' to the value 345.6. The second line is an 'IF' statement that checks if 'aCoordinates[10,3,5]' is equal to 987.456. The 'END_IF' statement is on line 6.

```
1
2 aCoordinates[1,5,7] := 345.6;
3
4 IF aCoordinates[10,3,5] = 987.456 THEN
5
6 END_IF
7
```

Arrays - Initialization

- Initializing each index of an array

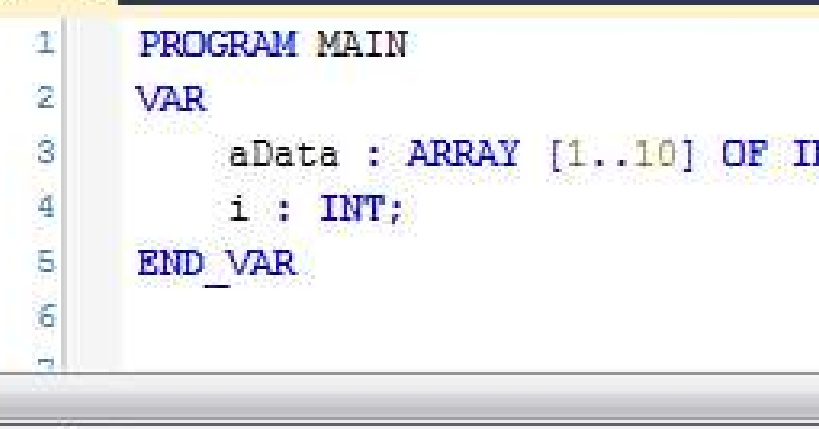
```
1 PROGRAM MAIN
2 VAR
3     aData : ARRAY [1..10] OF INT := [2,4,6,8,1,3,5,7,9,0];
4 END_VAR
5
```

- Initializing multiple indexes with the same value

```
1 PROGRAM MAIN
2 VAR
3     aData : ARRAY [1..10] OF INT := [2(4),2(1),6(45)];
4 END_VAR
5
```

- The above 2 examples can be mixed together

```
1 PROGRAM MAIN
2 VAR
3     aData : ARRAY [1..10] OF INT := [2(4),5,9,6(45)];
4 END_VAR
5
```

- 
- ```
1 PROGRAM MAIN
2 VAR
3 aData : ARRAY [1..10] OF INT;
4 i : INT;
5 END_VAR
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