

STRING
character manipulations.

STRING Syntax.

STRING $\left\{ \text{Source\$il} \dots \text{DELIMITED BY} \left\{ \begin{array}{l} \text{Delim\$il} \\ \text{SIZE} \end{array} \right\} \right\} \dots$
INTO Dest\$**i**
[**WITH POINTER** Pointer#**i**]
[**ON OVERFLOW** StatementBlock]
[**NOT ON OVERFLOW** StatementBlock]
[**END - STRING**]

STRING Ident1, Ident2, "10" **DELIMITED BY SIZE**
 INTO DestString
END-STRING.

STRING Ident1 **DELIMITED BY SIZE**
 Ident2 **DELIMITED BY SPACES**
 Ident3 **DELIMITED BY "Frogs"**
 INTO Ident4 **WITH POINTER** StrPtr
END-STRING.

How the STRING Works

The STRING moves characters from the source string into the destination string from **left to right**.
But no space filling occurs.

When there are a number of source strings, characters are moved from the **leftmost** source string first.

When a **WITH POINTER** phrase is used its value determines the starting character position for insertion into the destination string.

The **ON OVERFLOW** clause executes if there are still valid characters left in the source strings but the destination string is full.

STRING Example 1

01 DayStr PIC XX.

5	
---	--

01 MonthStr PIC X(9).

J	U	N	E					
---	---	---	---	--	--	--	--	--

01 YearStr PIC X(4).

1	9	9	4
---	---	---	---

01 DateStr PIC X(15) VALUE ALL "-".

-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

```
STRING DayStr      DELIMITED BY SPACES
      ", "          DELIMITED BY SIZE
      MonthStr     DELIMITED BY SPACES
      ", "          DELIMITED BY SIZE
      YearStr      DELIMITED BY SIZE
      INTO DateStr
END-STRING.
```

STRING Example 1

01 DayStr PIC XX.

5	
---	--

01 MonthStr PIC X(9).

J	U	N	E					
---	---	---	---	--	--	--	--	--

01 YearStr PIC X(4).

1	9	9	4
---	---	---	---

01 DateStr PIC X(15) VALUE ALL "-".

5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

```
STRING DayStr      DELIMITED BY SPACES
      ", "          DELIMITED BY SIZE
      MonthStr     DELIMITED BY SPACES
      ", "          DELIMITED BY SIZE
      YearStr      DELIMITED BY SIZE
      INTO DateStr
END-STRING.
```

STRING Example 1

01 DayStr PIC XX.

5	
---	--

01 MonthStr PIC X(9).

J	U	N	E					
---	---	---	---	--	--	--	--	--

01 YearStr PIC X(4).

1	9	9	4
---	---	---	---

01 DateStr PIC X(15) VALUE ALL "-".

5	,	-	-	-	-	-	-	-	-	-	-	-	-	-
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

```
STRING DayStr      DELIMITED BY SPACES
      ", "          DELIMITED BY SIZE
      MonthStr     DELIMITED BY SPACES
      ", "          DELIMITED BY SIZE
      YearStr      DELIMITED BY SIZE
      INTO DateStr
END-STRING.
```

STRING Example 1

01 DayStr PIC XX.

5	
---	--

01 MonthStr PIC X(9).

J	U	N	E					
---	---	---	---	--	--	--	--	--

01 YearStr PIC X(4).

1	9	9	4
---	---	---	---

01 DateStr PIC X(15) VALUE ALL "-".

5	,	J	U	N	E	-	-	-	-	-	-	-	-	-
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

```
STRING DayStr      DELIMITED BY SPACES
      ", "          DELIMITED BY SIZE
      MonthStr      DELIMITED BY SPACES
      ", "          DELIMITED BY SIZE
      YearStr       DELIMITED BY SIZE
      INTO DateStr
END-STRING.
```

STRING Example 1

01 DayStr PIC XX.

5	
---	--

01 MonthStr PIC X(9).

J	U	N	E					
---	---	---	---	--	--	--	--	--

01 YearStr PIC X(4).

1	9	9	4
---	---	---	---

01 DateStr PIC X(15) VALUE ALL "-".

5	,	J	U	N	E	,	-	-	-	-	-	-	-	-	-
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

```
STRING DayStr      DELIMITED BY SPACES
      ", "          DELIMITED BY SIZE
      MonthStr     DELIMITED BY SPACES
      ", "          DELIMITED BY SIZE
      YearStr      DELIMITED BY SIZE
      INTO DateStr
END-STRING.
```

STRING Example 1

01 DayStr PIC XX.

5	
---	--

01 MonthStr PIC X(9).

J	U	N	E					
---	---	---	---	--	--	--	--	--

01 YearStr PIC X(4).

1	9	9	4
---	---	---	---

01 DateStr PIC X(15) VALUE ALL "-".

5	,	J	U	N	E	,	1	9	9	4	-	-	-	-
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

```
STRING DayStr      DELIMITED BY SPACES
      ", "          DELIMITED BY SIZE
      MonthStr     DELIMITED BY SPACES
      ", "          DELIMITED BY SIZE
      YearStr      DELIMITED BY SIZE
      INTO DateStr
END-STRING.
```

STRING Example 2

01 StrPtr PIC 99.

01 DayStr PIC XX.

5	
---	--

01 MonthStr PIC X(9).

J	U	N	E					
---	---	---	---	--	--	--	--	--

01 YearStr PIC X(4).

1	9	9	4
---	---	---	---

01 DateStr PIC X(15) VALUE ALL "-".

-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---



MOVE 1 TO StrPtr

STRING DayStr DELIMITED BY SPACES
 ,"," DELIMITED BY SIZE
 INTO DateStr

END-STRING.

STRING MonthStr DELIMITED BY SPACES
 ,"," DELIMITED BY SIZE
 INTO DateStr

END-STRING.

STRING YearStr DELIMITED BY SIZE
END-STRING.

STRING Example 2

01 StrPtr PIC 99.

01 DayStr PIC XX.

5	
---	--

01 MonthStr PIC X(9).

J	U	N	E					
---	---	---	---	--	--	--	--	--

01 YearStr PIC X(4).

1	9	9	4
---	---	---	---

01 DateStr PIC X(15) VALUE ALL "-".

5	,	-	-	-	-	-	-	-	-	-	-	-	-	-
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---



MOVE 1 TO StrPtr

STRING DayStr DELIMITED BY SPACES
 ,"," DELIMITED BY SIZE
 INTO DateStr WITH POINTER StrPtr

END-STRING.

STRING MonthStr DELIMITED BY SPACES
 ,"," DELIMITED BY SIZE
 INTO DateStr WITH POINTER StrPtr

END-STRING.

STRING YearStr DELIMITED BY SIZE
 INTO DateStr WITH POINTER StrPtr

END-STRING.

STRING Example 2

01 StrPtr PIC 99.

01 DayStr PIC XX.

5	
---	--

01 MonthStr PIC X(9).

J	U	N	E					
---	---	---	---	--	--	--	--	--

01 YearStr PIC X(4).

1	9	9	4
---	---	---	---

01 DateStr PIC X(15) VALUE ALL "-".

5	,	J	U	N	E	,	-	-	-	-	-	-	-	-	-
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

MOVE 1 TO StrPtr

STRING DayStr DELIMITED BY SPACES

 "," DELIMITED BY SIZE

 INTO DateStr WITH POINTER StrPtr

END-STRING.

STRING MonthStr DELIMITED BY SPACES

 "," DELIMITED BY SIZE

 INTO DateStr WITH POINTER StrPtr

END-STRING.

STRING YearStr DELIMITED BY SIZE

 INTO DateStr WITH POINTER StrPtr

END-STRING.



STRING Example 2

01 StrPtr PIC 99.

01 DayStr PIC XX.

5	
---	--

01 MonthStr PIC X(9).

J	U	N	E					
---	---	---	---	--	--	--	--	--

01 YearStr PIC X(4).

1	9	9	4
---	---	---	---

01 DateStr PIC X(15) VALUE ALL "-".

5	,	J	U	N	E	,	1	9	9	9	4	-	-	-	-	-
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

```
MOVE 1 TO StrPtr
STRING DayStr DELIMITED BY SPACES
      ","      DELIMITED BY SIZE
      INTO DateStr WITH POINTER StrPtr
END-STRING.
STRING MonthStr DELIMITED BY SPACES
      ","      DELIMITED BY SIZE
      INTO DateStr WITH POINTER StrPtr
END-STRING.
STRING YearStr DELIMITED BY SIZE
      INTO DateStr WITH POINTER StrPtr
END-STRING.
```



STRING Example 3

```
01 StringFields.  
02 Field1  PIC X(18) VALUE "Where does this go".  
02 Field2  PIC X(30)  
            VALUE "This is the destination string".  
02 Field3  PIC X(15) VALUE "Here is another".  
  
01 StrPointers.  
02 StrPtr   PIC 99.  
02 NewPtr   PIC 9.
```

This is the destination string

```
STRING Field1 DELIMITED BY SPACES  
      INTO Field2  
END-STRING.  
DISPLAY Field2.
```

STRING Example 3

```
01 StringFields.  
02 Field1  PIC X(18) VALUE "Where does this go".  
02 Field2  PIC X(30)  
           VALUE "This is the destination string".  
02 Field3  PIC X(15) VALUE "Here is another".
```

```
01 StrPointers.
```

```
02 StrPtr  PIC 99.  
02 NewPtr  PIC 9.
```

Where is the destination string

```
STRING Field1 DELIMITED BY SPACES  
      INTO Field2  
END-STRING.  
DISPLAY Field2.
```

STRING Example 4

```
01 StringFields.  
02 Field1  PIC X(18) VALUE "Where does this go".  
02 Field2  PIC X(30)  
           VALUE "This is the destination string".  
02 Field3  PIC X(15) VALUE "Here is another".
```

```
01 StrPointers.
```

```
02 StrPtr  PIC 99.  
02 NewPtr  PIC 9.
```

This is the destination string

```
STRING Field1 DELIMITED BY SIZE  
      INTO Field2  
END-STRING.  
DISPLAY Field2.
```

STRING Example 4

```
01 StringFields.  
02 Field1  PIC X(18) VALUE "Where does this go".  
02 Field2  PIC X(30)  
           VALUE "This is the destination string".  
02 Field3  PIC X(15) VALUE "Here is another".
```

```
01 StrPointers.
```

```
02 StrPtr  PIC 99.  
02 NewPtr  PIC 9.
```

Where does this goation string

```
STRING Field1 DELIMITED BY SIZE  
      INTO Field2  
END-STRING.  
DISPLAY Field2.
```

STRING Example 5

01 StringFields.

```
02 Field1  PIC X(18) VALUE "Where does this go".  
02 Field2  PIC X(30)  
              VALUE "This is the destination string".  
02 Field3  PIC X(15) VALUE "Here is another".
```

01 StrPointers.

```
02 StrPtr   PIC 99.  
02 NewPtr   PIC 9.
```

This ~~is the destination string~~

MOVE 6 TO StrPtr.

```
STRING Field1, Field3 DELIMITED BY SPACE  
      INTO Field2 WITH POINTER StrPtr  
      ON OVERFLOW DISPLAY "String Error"  
      NOT ON OVERFLOW DISPLAY Field2
```

END-STRING.

STRING Example 5

```
01 StringFields.  
 02 Field1  PIC X(18) VALUE "Where does this go".  
 02 Field2  PIC X(30)  
            VALUE "This is the destination string".  
 02 Field3  PIC X(15) VALUE "Here is another".  
  
01 StrPointers.  
 02 StrPtr   PIC 99.  
 02 NewPtr   PIC 9.
```

This **WhereHerestation** string

```
MOVE 6 TO StrPtr.  
STRING Field1, Field3 DELIMITED BY SPACE  
      INTO Field2 WITH POINTER StrPtr  
      ON OVERFLOW DISPLAY "String Error"  
      NOT ON OVERFLOW DISPLAY Field2  
END-STRING.
```

STRING Example 6

```
01 StringFields.  
 02 Field1  PIC X(18) VALUE "Where does this go".  
 02 Field2  PIC X(30)  
                VALUE "This is the destination string".  
 02 Field3  PIC X(15) VALUE "Here is another".  
  
01 StrPointers.  
 02 StrPtr   PIC 99.  
 02 NewPtr   PIC 9.
```

```
STRING Field1, Field2, Field3  
       DELIMITED BY SPACES  
       INTO Field4  
END-STRING.  
DISPLAY Field4
```

STRING Example 6

```
01 StringFields.  
 02 Field1  PIC X(18) VALUE "Where does this go".  
 02 Field2  PIC X(30)  
                VALUE "This is the destination string".  
 02 Field3  PIC X(15) VALUE "Here is another".  
  
01 StrPointers.  
 02 StrPtr   PIC 99.  
 02 NewPtr   PIC 9.
```

WhereThisHere

```
STRING Field1, Field2, Field3  
        DELIMITED BY SPACES  
        INTO Field4  
END-STRING.  
DISPLAY Field4
```

STRING Example 7

```
01 StringFields.  
 02 Field1  PIC X(18) VALUE "Where does this go".  
 02 Field2  PIC X(30)  
            VALUE "This is the destination string".  
 02 Field3  PIC X(15) VALUE "Here is another".  
  
01 StrPointers.  
 02 StrPtr   PIC 99.  
 02 NewPtr   PIC 9.
```

This is the destination string

```
MOVE 4 TO NewPtr.  
STRING Field1 DELIMITED BY "this"  
      Field3 DELIMITED BY SPACE  
      "END"  DELIMITED BY SIZE  
      INTO Field2  
END-STRING.
```

STRING Example 7

```
01 StringFields.  
 02 Field1  PIC X(18) VALUE "Where does this go".  
 02 Field2  PIC X(30)  
            VALUE "This is the destination string".  
 02 Field3  PIC X(15) VALUE "Here is another".  
  
01 StrPointers.  
 02 StrPtr   PIC 99.  
 02 NewPtr   PIC 9.
```

Where does HereENDation string

```
MOVE 4 TO NewPtr.  
STRING Field1 DELIMITED BY "this"  
      Field3 DELIMITED BY SPACE  
      "END"  DELIMITED BY SIZE  
      INTO Field2  
END-STRING.
```

UNSTRING

UNSTRING Syntax.

```
UNSTRING SourceStr$i  
  [DELIMITED BY [ALL] Delim$il [OR [ALL] Delim$il]] ...]  
  INTO {DestStr$i [DELIMITER IN HoldDelim$i]}  
    [COUNT IN CharCounter# i] ...  
  [WITH POINTER Pointer# i]  
  [TALLYING IN DestCounter# i]  
  [ON OVERFLOW StatementBlock]  
  [NOT ON OVERFLOW StatementBlock]  
  [END - UNSTRING]
```

```
UNSTRING FullName DELIMITED BY ALL SPACES  
  INTO FirstName, SecondName, Surname  
END-UNSTRING
```

```
UNSTRING CustAddress DELIMITED BY ","  
  INTO AdrLine(1), AdrLine(2), AdrLine(3),  
        AdrLine(4), AdrLine(5), AdrLine(6)  
  TALLYING IN AdrLinesUsed  
END-UNSTRING.
```



How the UNSTRING works

The UNSTRING copies characters from the **Source String** to the **Destination String** until a **Delimiter** is encountered in the **Source String** or the **Destination String** is full.

When either of these things happen the next **Destination String** becomes the receiving area and characters are copied into it until it too is full or another **Delimiter** is encountered in the **Source String**.

Characters are copied from the **Source String** to the **Destination Strings** according to the rules for Alphanumeric moves. There **is** space filling.



UNSTRING Termination

The UNSTRING statement terminates when:-

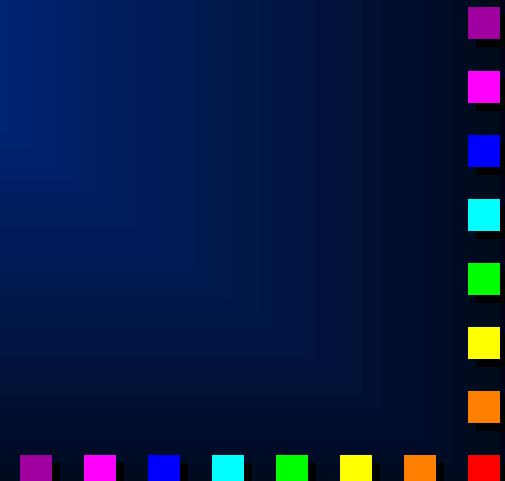
All the characters in the *Source String* have been examined

OR

All the *Destination Strings* have been processed

OR

Some *error condition* is encountered.



UNSTRING clauses.

◆ **ON OVERFLOW.**

The ON OVERFLOW is activated if :-

- The Unstring pointer (Pointer#i) is **not pointing** to a character position **within** the **SourceString** when the UNSTRING executes.
- All the Destination Strings have been processed but there are still valid **unexamined characters in the Source String.**

◆ **COUNT IN**

The COUNT IN clause is associated with a particular Destination String and holds a **count of the number of **characters** passed to the Destination String.**

◆ **TALLYING IN**

Only one TALLYING clause can be used with each UNSTRING. It holds a **count of the number of **Destination Strings** affected by the UNSTRING operation.**



The UNSTRING clauses 2.

- ◆ **WITH POINTER**

The **Pointer#i** holds the **position** of the next non-delimiter character to be **examined** in the **Source String**.

Pointer#i must be **large enough** to hold a value **one greater** than the size of the **Source String**.

- ◆ **DELIMITER IN**

A **DELIMITER IN** clause is associated with a particular Destination String. **HoldDelim\$i** holds the **Delimiter** that was **encountered** in the **Source String**.

- ◆ **ALL**

When the **ALL** phrase is used, **contiguous delimiters** are treated as if only **one delimiter** had been encountered.



UNSTRING Example 1

01 DayStr PIC XX.



01 MonthStr PIC XX.



01 YearStr PIC XX.

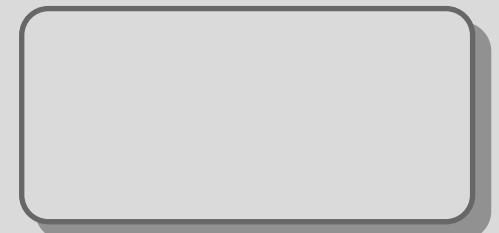


01 DateStr PIC X(8).



ACCEPT DateStr.

```
UNSTRING DateStr  
      INTO DayStr, MonthStr, YearStr  
      ON OVERFLOW DISPLAY "Chars Left"  
END-UNSTRING.
```



UNSTRING Example 1

```
01 DayStr    PIC XX.
```

1	9
---	---

```
01 MonthStr  PIC XX.
```

--	--

```
01 YearStr   PIC XX.
```

--	--

```
01 DateStr   PIC X(8).
```

1	9	0	5	-	8	0
---	---	---	---	---	---	---

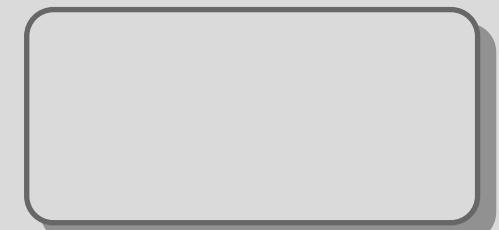
```
ACCEPT DateStr.
```

```
UNSTRING DateStr
```

```
    INTO DayStr, MonthStr, YearStr
```

```
    ON OVERFLOW DISPLAY "Chars Left"
```

```
END-UNSTRING.
```



UNSTRING Example 1

```
01 DayStr    PIC XX.
```

1	9
---	---

```
01 MonthStr  PIC XX.
```

-	0
---	---

```
01 YearStr   PIC XX.
```

--	--

```
01 DateStr   PIC X(8).
```

1	9	-	0	5	-	8	0
---	---	---	---	---	---	---	---

```
ACCEPT DateStr.
```

```
UNSTRING DateStr
```

```
    INTO DayStr, MonthStr, YearStr
```

```
    ON OVERFLOW DISPLAY "Chars Left"
```

```
END-UNSTRING.
```



UNSTRING Example 1

01 DayStr PIC XX.

1	9
---	---

01 MonthStr PIC XX.

-	0
---	---

01 YearStr PIC XX.

5	-
---	---

01 DateStr PIC X(8).

1	9	-	0	5	-	8	0
---	---	---	---	---	---	---	---

ACCEPT DateStr.

UNSTRING DateStr

INTO DayStr, MonthStr, YearStr

ON OVERFLOW DISPLAY "Chars Left"

END-UNSTRING.



UNSTRING Example 1

01 DayStr PIC XX.

1	9
---	---

01 MonthStr PIC XX.

-	0
---	---

01 YearStr PIC XX.

5	-
---	---

01 DateStr PIC X(8).

1	9	-	0	5	-	8	0
---	---	---	---	---	---	---	---

ACCEPT DateStr.

UNSTRING DateStr

INTO DayStr, MonthStr, YearStr

ON OVERFLOW DISPLAY "Chars Left"

END-UNSTRING.

Chars Left



UNSTRING Example 2

01 DayStr PIC XX.



01 MonthStr PIC XX.



01 YearStr PIC XX.



01 DateStr PIC X(8).



ACCEPT DateStr.

```
UNSTRING DateStr DELIMITED BY "stop"
      INTO DayStr, MonthStr, YearStr
      ON OVERFLOW DISPLAY "Chars Left"
END-UNSTRING.
```



UNSTRING Example 2

01 DayStr PIC XX.

1	9
---	---

01 MonthStr PIC XX.

--	--

01 YearStr PIC XX.

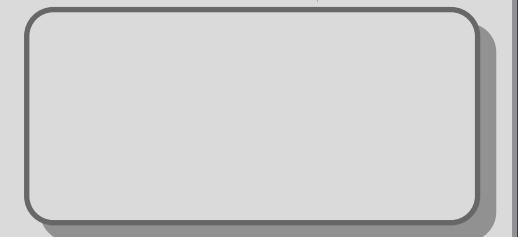
--	--

01 DateStr PIC X(8).

1	9	s	t	o	p	0	5	s	t	o	p	8	0
---	---	---	---	---	---	---	---	---	---	---	---	---	---

ACCEPT DateStr.

UNSTRING DateStr DELIMITED BY "stop"
INTO DayStr, MonthStr, YearStr
ON OVERFLOW DISPLAY "Chars Left"
END-UNSTRING.



UNSTRING Example 2

01 DayStr PIC XX.

1	9
---	---

01 MonthStr PIC XX.

0	5
---	---

01 YearStr PIC XX.

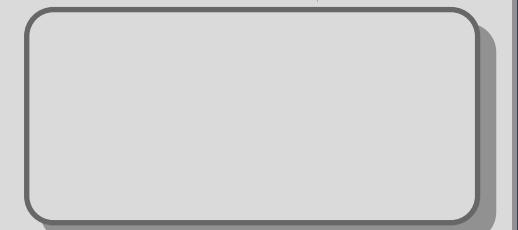
--	--

01 DateStr PIC X(8).

1	9	s	t	o	p	0	5	s	t	o	p	8	0
---	---	---	---	---	---	---	---	---	---	---	---	---	---

ACCEPT DateStr.

UNSTRING DateStr DELIMITED BY "stop"
INTO DayStr, MonthStr, YearStr
ON OVERFLOW DISPLAY "Chars Left"
END-UNSTRING.



UNSTRING Example 2

01 DayStr PIC XX.

1	9
---	---

01 MonthStr PIC XX.

0	5
---	---

01 YearStr PIC XX.

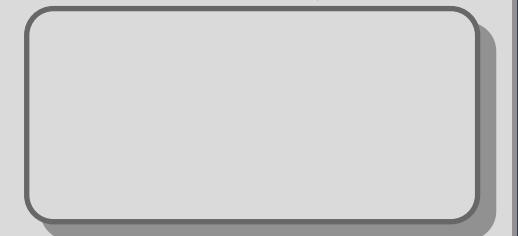
8	0
---	---

01 DateStr PIC X(8).

1	9	s	t	o	p	0	5	s	t	o	p	8	0
---	---	---	---	---	---	---	---	---	---	---	---	---	---

ACCEPT DateStr.

UNSTRING DateStr DELIMITED BY "stop"
INTO DayStr, MonthStr, YearStr
ON OVERFLOW DISPLAY "Chars Left"
END-UNSTRING.



UNSTRING Example 3

01 DayStr PIC XX.

1	9
---	---

01 MonthStr PIC XX.

--	--

01 YearStr PIC XX.

--	--

01 DateStr PIC X(8).

1	9	-	0	5	/	8	0
---	---	---	---	---	---	---	---

ACCEPT DateStr.

UNSTRING DateStr

DELIMITED BY "/" OR "-"

INTO DayStr DELIMITER IN Hold1

MonthStr DELIMITER IN Hold2

YearStr

END-UNSTRING.

DISPLAY DayStr SPACE MonthStr SPACE YearStr.

DISPLAY Hold1 SPACE Hold2



UNSTRING Example 3

01 DayStr PIC XX.

1	9
---	---

01 MonthStr PIC XX.

0	5
---	---

01 YearStr PIC XX.

--	--

01 DateStr PIC X(8).

1	9	-	0	5	/	8	0
---	---	---	---	---	---	---	---

ACCEPT DateStr.

UNSTRING DateStr

DELIMITED BY "/" OR "-"

INTO DayStr DELIMITER IN Hold1

MonthStr DELIMITER IN Hold2

YearStr

END-UNSTRING.

DISPLAY DayStr SPACE MonthStr SPACE YearStr.

DISPLAY Hold1 SPACE Hold2



UNSTRING Example 3

01 DayStr PIC XX.

1	9
---	---

01 MonthStr PIC XX.

0	5
---	---

01 YearStr PIC XX.

8	0
---	---

01 DateStr PIC X(8).

1	9	-	0	5	/	8	0
---	---	---	---	---	---	---	---

ACCEPT DateStr.

UNSTRING DateStr

DELIMITED BY "/" OR "-"

INTO DayStr DELIMITER IN Hold1

MonthStr DELIMITER IN Hold2

YearStr

END-UNSTRING.

DISPLAY DayStr SPACE MonthStr SPACE YearStr.

DISPLAY Hold1 SPACE Hold2



UNSTRING Example 3

01 DayStr PIC XX.

1	9
---	---

01 MonthStr PIC XX.

0	5
---	---

01 YearStr PIC XX.

8	0
---	---

01 DateStr PIC X(8).

1	9	-	0	5	/	8	0
---	---	---	---	---	---	---	---

ACCEPT DateStr.

UNSTRING DateStr

DELIMITED BY "/" OR "-"

INTO DayStr DELIMITER IN Hold1

MonthStr DELIMITER IN Hold2

YearStr

END-UNSTRING.

DISPLAY DayStr SPACE MonthStr SPACE YearStr.

DISPLAY Hold1 SPACE Hold2

19 05 80

- /



UNSTRING Example 4

```
01 DayStr    PIC XX.
```



```
01 MonthStr PIC XX.
```



```
01 YearStr   PIC XX.
```



```
01 DateStr   PIC X(8).
```



```
ACCEPT DateStr.
```

```
UNSTRING DateStr
```

```
    DELIMITED BY "/" OR "-"
```

```
    INTO DayStr    DELIMITER IN Hold1
```

```
        MonthStr  DELIMITER IN Hold1
```

```
        YearStr
```

```
END-UNSTRING.
```

```
DISPLAY DayStr SPACE MonthStr SPACE YearStr.
```

```
DISPLAY Hold1
```



UNSTRING Example 4

01 DayStr PIC XX.

1	9
---	---

01 MonthStr PIC XX.

0	5
---	---

01 YearStr PIC XX.

8	0
---	---

01 DateStr PIC X(8).

1	9	-	0	5	/	8	0
---	---	---	---	---	---	---	---

ACCEPT DateStr.

UNSTRING DateStr

DELIMITED BY "/" OR "-"

INTO DayStr DELIMITER IN Hold1

MonthStr DELIMITER IN Hold1

YearStr

END-UNSTRING.

DISPLAY DayStr SPACE MonthStr SPACE YearStr.

DISPLAY Hold1

19 05 80

/



UNSTRING Example 5

01 DayStr PIC XX.

--	--

01 MonthStr PIC XX.

--	--

01 YearStr PIC XX.

--	--

01 DateStr PIC X(11).

1	5	-	-	0	7	-	-	9	4
---	---	---	---	---	---	---	---	---	---

ACCEPT DateStr.

UNSTRING DateStr

DELIMITED BY ALL "--"

INTO DayStr, MonthStr, YearStr

ON OVERFLOW DISPLAY "Chars Left"

END-UNSTRING.



UNSTRING Example 5

01 DayStr PIC XX.

1	5
---	---

01 MonthStr PIC XX.

0	7
---	---

01 YearStr PIC XX.

9	4
---	---

01 DateStr PIC X(11).

1	5	-	-	0	7	-	-	9	4
---	---	---	---	---	---	---	---	---	---

```
ACCEPT DateStr.  
UNSTRING DateStr  
    DELIMITED BY ALL "--"  
    INTO DayStr, MonthStr, YearStr  
    ON OVERFLOW DISPLAY "Chars Left"  
END-UNSTRING.
```

UNSTRING Example 6

01 DayStr PIC XX.

--	--

01 MonthStr PIC XX.

--	--

01 YearStr PIC XX.

--	--

01 DateStr PIC X(11).

1	5	-	-	0	7	-	-	9	4
---	---	---	---	---	---	---	---	---	---

```
ACCEPT DateStr.  
UNSTRING DateStr  
  DELIMITED BY "--"  
  INTO DayStr, MonthStr, YearStr  
  ON OVERFLOW DISPLAY "Chars Left"  
END-UNSTRING.
```

UNSTRING Example 7

```
01 OldName PIC X(80) .
```

Tim John Roberts



```
01 TempName .
```



```
02 NameInitial PIC X .
```

```
02 FILLER PIC X(15) .
```

```
01 NewName PIC X(30) .
```

```
01 Pointers .
```

```
02 StrPtr PIC 99 VALUE 1 .
```

```
02 UnstrPtr PIC 99 VALUE 1 .
```

```
88 NameProcessed VALUE 81 .
```



PROCEDURE DIVISION.

ProcessName.

ACCEPT OldName .

PERFORM UNTIL NameProcessed

 UNSTRING OldName DELIMITED BY ALL SPACES

 INTO TempName WITH POINTER UnstrPtr

 END-UNSTRING

 Display TempName

END-PERFORM

STOP RUN .

UNSTRING Example 7

```
01 OldName PIC X(80) .
```

Tim  John Roberts



```
01 TempName .
```

T im

```
02 NameInitial PIC X .
```

```
02 FILLER PIC X(15) .
```

```
01 NewName PIC X(30) .
```

```
01 Pointers .
```

```
02 StrPtr PIC 99 VALUE 1 .
```

```
02 UnstrPtr PIC 99 VALUE 1 .
```

```
88 NameProcessed VALUE 81 .
```

Tim

PROCEDURE DIVISION.

ProcessName.

```
ACCEPT OldName .
```

```
PERFORM UNTIL NameProcessed
```

```
    UNSTRING OldName DELIMITED BY ALL SPACES
```

```
        INTO TempName WITH POINTER UnstrPtr
```

```
    END-UNSTRING
```

Display TempName

```
END-PERFORM
```

```
STOP RUN .
```

UNSTRING Example 7

```
01 OldName PIC X(80) .
```

Tim John Roberts



J ohn

```
01 TempName .
```

```
02 NameInitial PIC X .
```

```
02 FILLER PIC X(15) .
```

```
01 NewName PIC X(30) .
```

```
01 Pointers .
```

```
02 StrPtr PIC 99 VALUE 1 .
```

```
02 UnstrPtr PIC 99 VALUE 1 .
```

```
88 NameProcessed VALUE 81 .
```

John

PROCEDURE DIVISION.

ProcessName .

```
ACCEPT OldName .
```

```
PERFORM UNTIL NameProcessed
```

```
    UNSTRING OldName DELIMITED BY ALL SPACES
```

```
        INTO TempName WITH POINTER UnstrPtr
```

```
    END-UNSTRING
```

Display TempName

```
END-PERFORM
```

```
STOP RUN .
```

UNSTRING Example 7

```
01 OldName PIC X(80) .
```

Tim John Roberts

```
01 TempName .
```

R oberts

```
02 NameInitial PIC X .
```

```
02 FILLER PIC X(15) .
```

```
01 NewName PIC X(30) .
```

```
01 Pointers .
```

```
02 StrPtr PIC 99 VALUE 1 .
```

```
02 UnstrPtr PIC 99 VALUE 1 .
```

```
88 NameProcessed VALUE 81 .
```

Roberts

PROCEDURE DIVISION.

ProcessName.

```
ACCEPT OldName .
```

```
PERFORM UNTIL NameProcessed
```

```
    UNSTRING OldName DELIMITED BY ALL SPACES
```

```
        INTO TempName WITH POINTER UnstrPtr
```

```
    END-UNSTRING
```

Display TempName

```
END-PERFORM
```

```
STOP RUN .
```

INSPECT

INSPECT Syntax - Format 1

INSPECT SourceStr\$i TALLYING

Counter# i FOR {
 CHARACTERS [{BEFORE} {AFTER}] INITIAL Delim\$il] ... } ...
 {ALL {LEADING} { Compare\$il [{BEFORE} {AFTER}] INITIAL Delim\$il] ... } ... } ...}

**INSPECT FullName TALLYING UnstrPtr
FOR LEADING SPACES.**

**INSPECT SourceLine TALLYING ECount
FOR ALL "e" AFTER INITIAL "start"
 BEFORE INITIAL "end".**



INSPECT Example 1

```
READ TextFile
  AT END SET EndOfFile TO TRUE
END-READ
PERFORM UNTIL EndOfFile
  PERFORM VARYING idx FROM 1 BY 1 UNTIL idx > 26
    INSPECT TextLine TALLYING LetterCount(idx)
      FOR ALL Letter(idx)
END-PERFORM
READ TextFile
  AT END SET EndOfFile TO TRUE
END-READ
END-PERFORM
PERFORM VARYING idx FROM 1 BY 1 UNTIL idx > 26
  DISPLAY "Letter " Letter(idx)
    " occurs " LetterCount(idx) " times"
END-PERFORM
```



How the INSPECT works.

The INSPECT scans the **Source String** from left to right **counting** and/or **replacing** characters under the control of the **TALLYING**, **REPLACING** or **CONVERTING** phrases.

The **behaviour** of the INSPECT is modified by using the **LEADING**, **FIRST**, **BEFORE** and **AFTER** phrases.

An **ALL**, **LEADING**, **CHARACTERS**, **FIRST** or **CONVERTING** phrase may only be followed by **one BEFORE** and **one AFTER** phrase.



Modifying Phrases

LEADING

The LEADING phrase causes counting/replacement of all Compare\$il characters from the **first valid one** encountered to the **first invalid one**.

FIRST

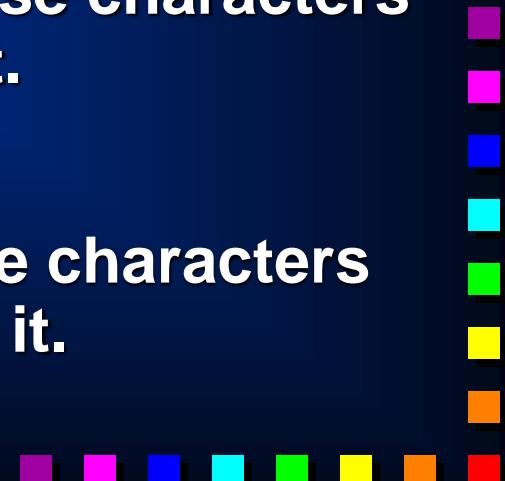
The FIRST phrase causes only the **first valid character** to be replaced.

BEFORE

The BEFORE phrase designates as valid those characters to the **left of the delimiter** associated with it.

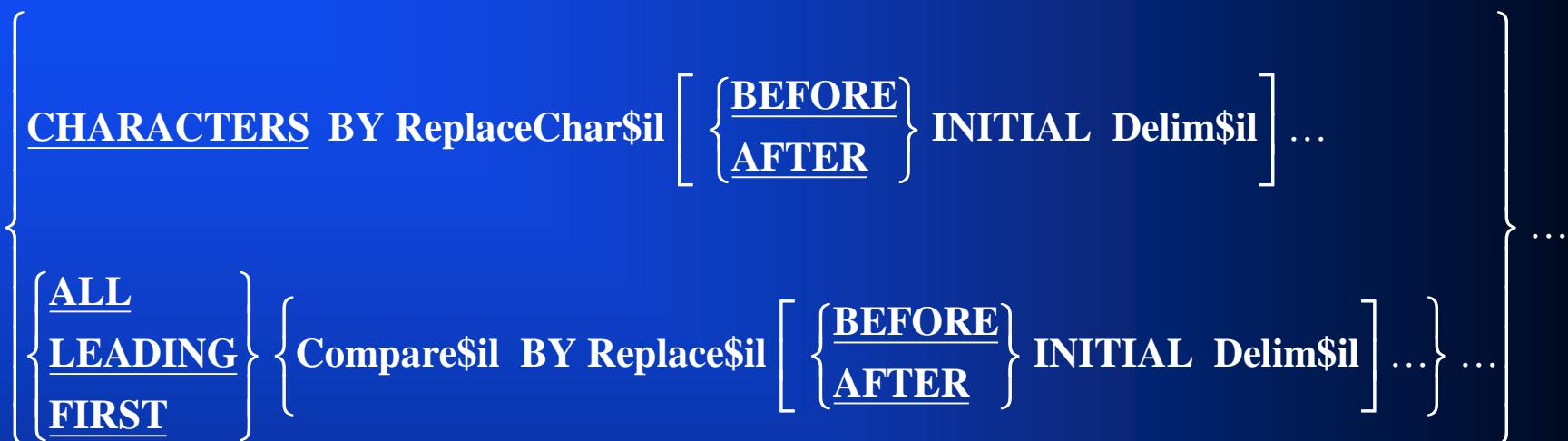
AFTER

The AFTER phrase designates as valid those characters to the **right of the delimiter** associated with it.



INSPECT Syntax - Format 2

INSPECT SourceStr\$i REPLACING



```
PERFORM VARYING idx FROM 1 BY 1 UNTIL idx > 10
INSPECT TextLine
    REPLACING SwearWord(idx) BY "*#@!"
END-PERFORM
```

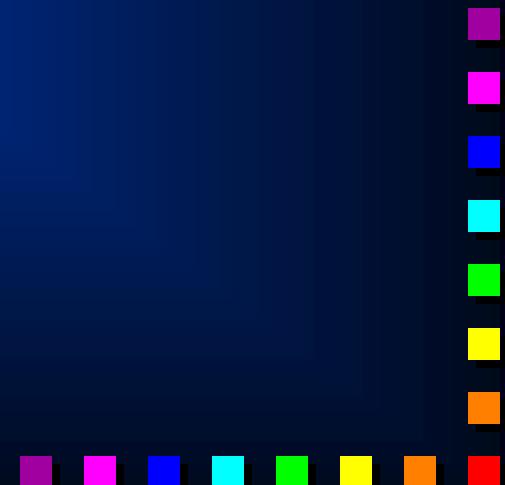


INSPECT Example 2

INSPECT StringData REPLACING ALL "F" BY "G"
AFTER INITIAL "A" BEFORE INITIAL "Q".

StringData

F	F	F	F	A	F	F	F	F	F	Q	F	F	F	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

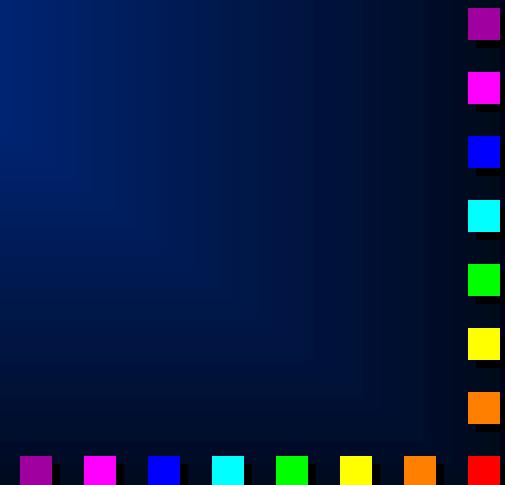


INSPECT Example 2

INSPECT StringData REPLACING ALL "F" BY "G"
AFTER INITIAL "A" BEFORE INITIAL "Q".

StringData

F	F	F	F	A	G	G	G	G	Q	F	F	F	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---

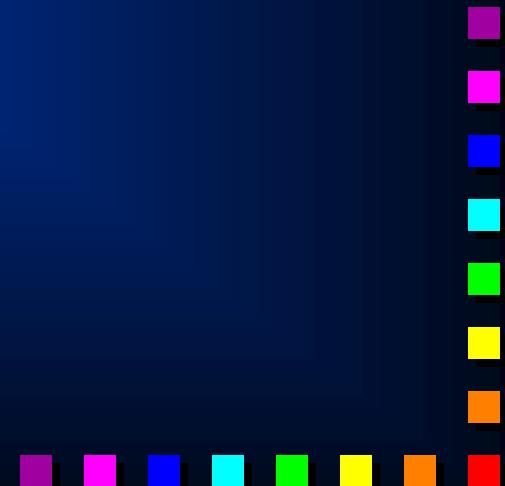


INSPECT Example 3

INSPECT StringData REPLACING LEADING "F" BY "G"
AFTER INITIAL "A" BEFORE INITIAL "Z".

StringData

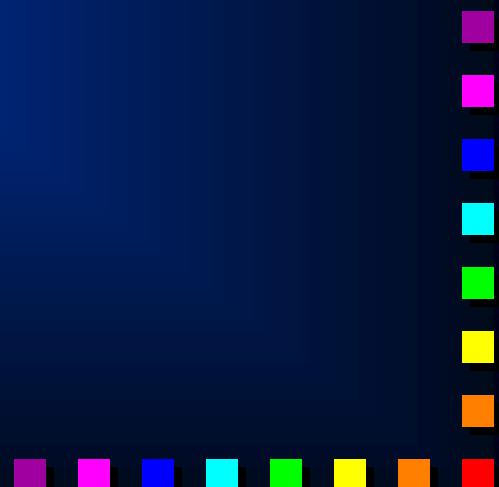
F	F	F	F	A	F	F	F	F	F	Q	F	F	F	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---



INSPECT Example 3

INSPECT StringData REPLACING LEADING "F" BY "G"
AFTER INITIAL "A" BEFORE INITIAL "Z".

StringData

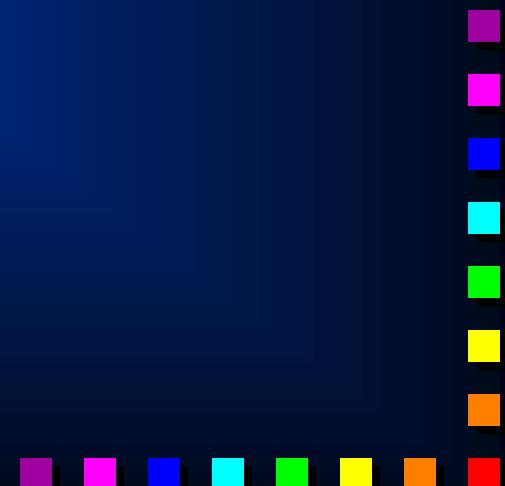


INSPECT Example 4

INSPECT StringData REPLACING ALL "F" BY "G"
AFTER INITIAL "A" BEFORE INITIAL "Z".

StringData

F	F	F	F	A	F	F	F	F	F	Q	F	F	F	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

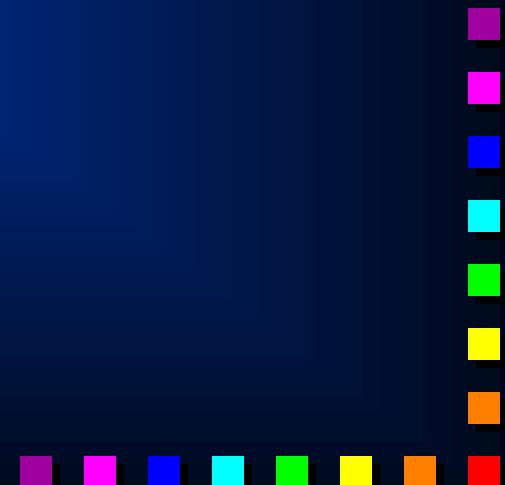


INSPECT Example 4

INSPECT StringData REPLACING ALL "F" BY "G"
AFTER INITIAL "A" BEFORE INITIAL "Z".

StringData

F	F	F	F	A	G	G	G	G	Q	G	G	G	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---

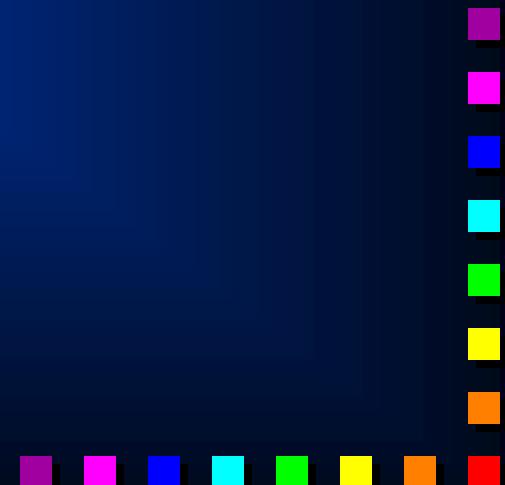


INSPECT Example 5

INSPECT StringData REPLACING FIRST "F" BY "G"
AFTER INITIAL "A" BEFORE INITIAL "Q".

StringData

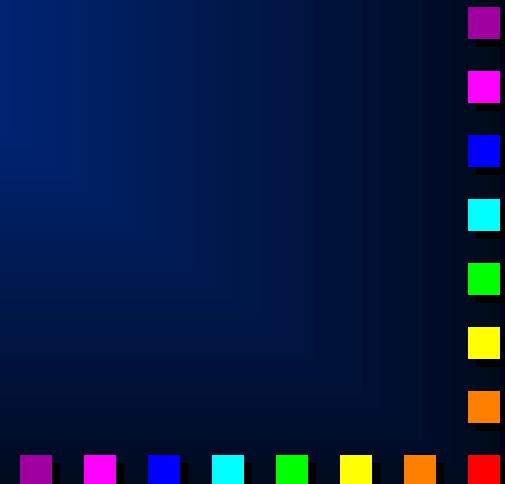
F	F	F	F	A	F	F	F	F	F	Q	F	F	F	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---



INSPECT Example 5

INSPECT StringData REPLACING FIRST "F" BY "G"
AFTER INITIAL "A" BEFORE INITIAL "Q".

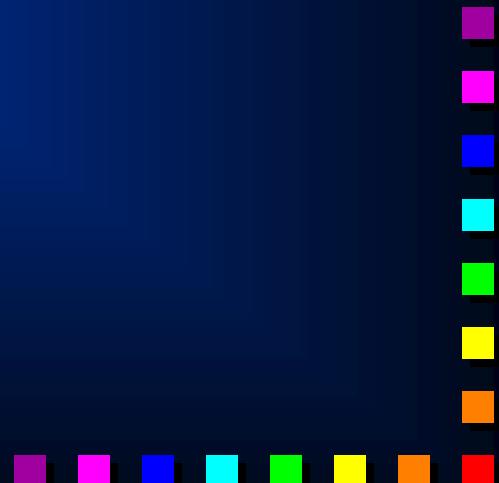
StringData



INSPECT Example 6

```
INSPECT StringData REPLACING  
    ALL "FFFF" BY "FROG"  
    AFTER INITIAL "A" BEFORE INITIAL "Q".
```

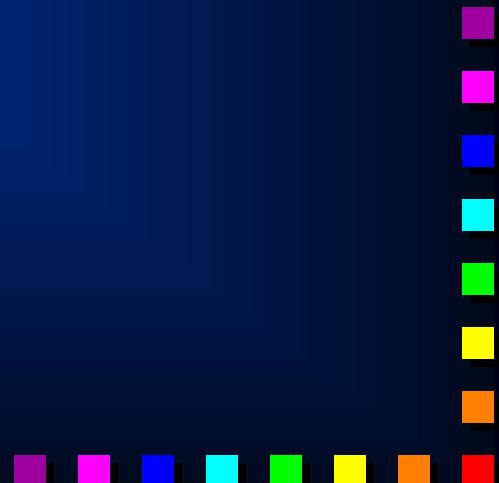
StringData



INSPECT Example 6

```
INSPECT StringData REPLACING  
    ALL "FFFF" BY "FROG"  
    AFTER INITIAL "A" BEFORE INITIAL "Q".
```

StringData



INSPECT Syntax - Format 3

INSPECT SourceStr*\$i* TALLYING

Counter# i FOR
$$\left\{ \begin{array}{l} \text{CHARACTERS} \left[\left\{ \frac{\text{BEFORE}}{\text{AFTER}} \right\} \text{INITIAL Delim\$il} \right] \dots \\ \left\{ \begin{array}{l} \text{ALL} \\ \text{LEADING} \end{array} \right\} \left\{ \text{De lim \$il} \left[\left\{ \frac{\text{BEFORE}}{\text{AFTER}} \right\} \text{INITIAL Delim\$il} \right] \dots \right\} \dots \end{array} \right\}$$

REPLACING
$$\left\{ \begin{array}{l} \text{CHARACTERS BY ReplaceChar\$il} \left[\left\{ \frac{\text{BEFORE}}{\text{AFTER}} \right\} \text{INITIAL Delim\$il} \right] \dots \\ \left\{ \begin{array}{l} \text{ALL} \\ \text{LEADING} \\ \text{FIRST} \end{array} \right\} \left\{ \text{Compare\$il BY Replace\$il} \left[\left\{ \frac{\text{BEFORE}}{\text{AFTER}} \right\} \text{INITIAL Delim\$il} \right] \dots \right\} \dots \end{array} \right\}$$



INSPECT Syntax - Format 4

INSPECT SourceStr\$1 CONVERTING

Compare\$1l TO Convert\$1l

$\left[\left\{ \begin{array}{c} \text{BEFORE} \\ \text{AFTER} \end{array} \right\} \text{ INITIAL } \text{Delim$1l} \right] \dots$

INSPECT TextLine CONVERTING

"0123456789" TO "5298317046"

AFTER INITIAL "codeon"

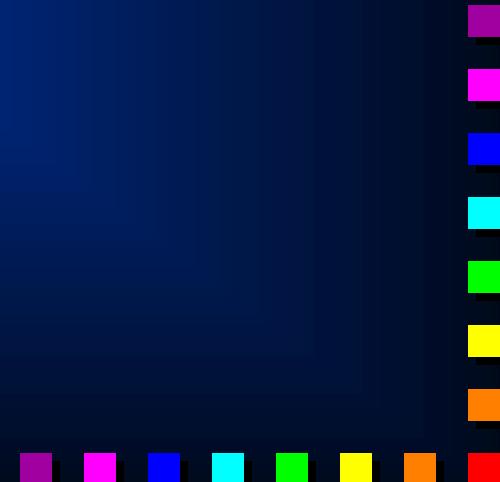
BEFORE INITIAL "codeoff".



INSPECT Example 7

INSPECT StringData CONVERTING "FXTD" TO "zyab".

StringData



INSPECT Example 7

INSPECT StringData CONVERTING "FXTD" TO "zyab".

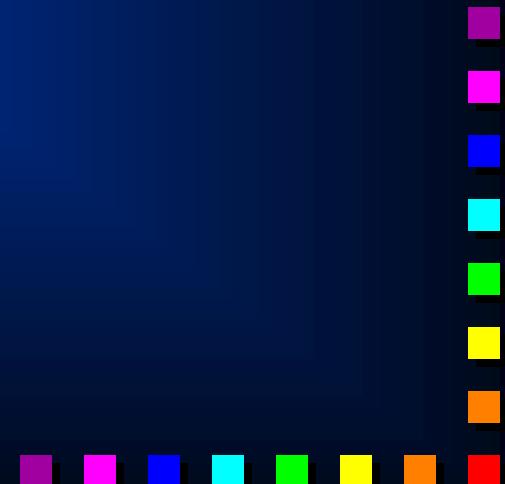
StringData



INSPECT Example 7

INSPECT StringData REPLACING "FXTD" BY "zyab".

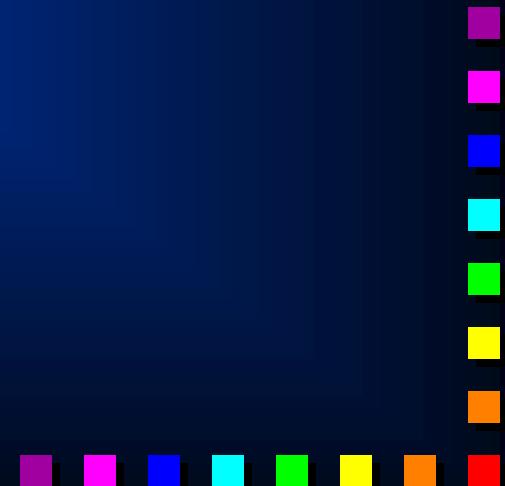
StringData



INSPECT Example 7

INSPECT StringData REPLACING "FXTD" BY "zyab".

StringData

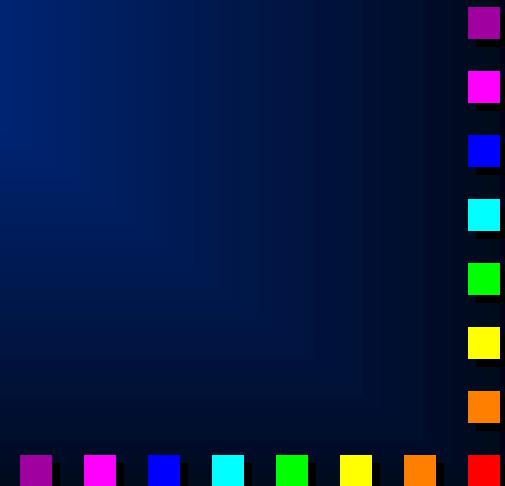


INSPECT Example 8

```
INSPECT StringData REPLACING ALL "x" BY "y"  
"d" BY "z"  
"f" BY "s".
```

StringData

P	x	P	f	P	d	P	T	P	P	f	x	T	d	P
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---



INSPECT Example 8

```
INSPECT StringData REPLACING ALL "X" BY "y"  
"D" BY "z"  
"F" BY "s".
```

StringData

P	y	P	s	P	z	P	T	P	P	s	y	T	z	P
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---



INSPECT Example 9

INSPECT CustAddress

CONVERTING "abcdefghijklmnopqrstuvwxyz"
TO "ABCDEFGHIJKLMNOPQRSTUVWXYZ".

01 AlphaChars.

02 AlphaLower PIC X(26) VALUE
"abcdefghijklmnopqrstuvwxyz".

02 AlphaUpper PIC X(26) VALUE
"ABCDEFGHIJKLMNOPQRSTUVWXYZ".

INSPECT CustAddress

CONVERTING AlphaLower TO AlphaUpper.

INSPECT CustAddress

CONVERTING AlphaUpper TO AlphaLower.



INSPECT Example 10

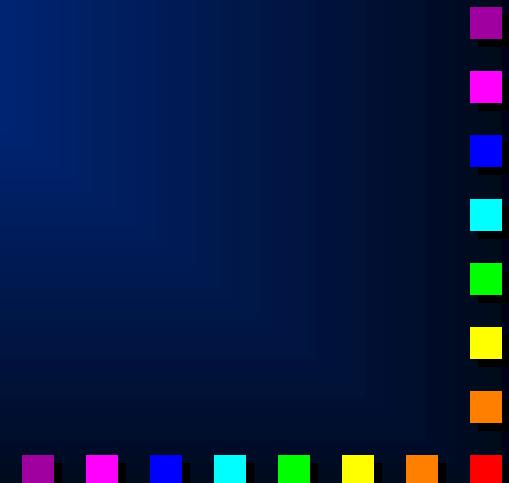
```
01 RussianPay PIC $$$,$$$,$$9.99.
```

```
MOVE 12345.67 TO RussianPay.
```

```
INSPECT RussianPay REPLACING ALL "$" BY "R".
```

```
DISPLAY RussianPay " roubles".
```

RussianPay



INSPECT Example 10

01 RussianPay PIC \$\$\$,\$\$\$,\$\$9.99.

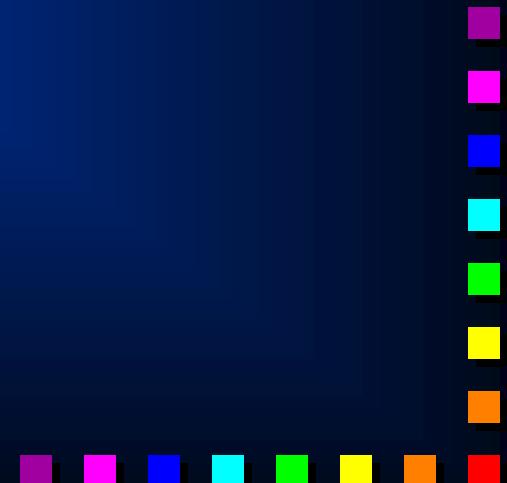
MOVE 12345.67 TO RussianPay.

INSPECT RussianPay REPLACING ALL "\$" BY "R".

DISPLAY RussianPay " roubles".

RussianPay

\$12,345.67



INSPECT Example 10

```
01 RussianPay PIC $$$,$$$,$$9.99.
```

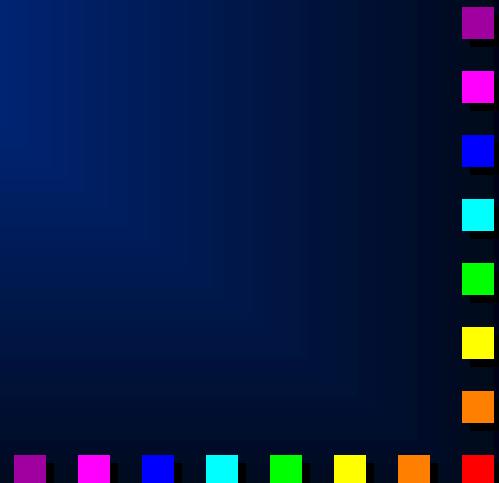
```
MOVE 12345.67 TO RussianPay.
```

```
INSPECT RussianPay REPLACING ALL "$" BY "R".
```

```
DISPLAY RussianPay " roubles".
```

RussianPay

R12,345.67



INSPECT Example 10

01 RussianPay PIC \$\$\$, \$\$9.99.

MOVE 12345.67 TO RussianPay.

INSPECT RussianPay REPLACING ALL "\$" BY "R".

DISPLAY RussianPay " roubles".

RussianPay

R12,345.67

R12,345.67 roubles



REFERENCE MODIFICATION

- SUBSTRING MANIPULATION IS CALLED REFERENCE MODIFICATION
- SUPPORTED WITH MOVE STATEMENT
- EX: WS-TEL CONTAINS 044-2231212

MOVE WS-STD-TEL(5:7) TO WS-A
means move 7 characters from the 5 th position of input

MOVE WS-STD-TEL(M:N) TO WS-A
M and N are numeric variables

MOVE WS-NAME(I-2:J+5) TO WS-A
If i=5 , j=2, move 7 characters from 3 rd position