

Characters and Strings

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Strings

1. Create string of length

```
character(len=50) :: mystring  
mystring = "short string"
```

2. String length

String length, with / without trimming.

Code:

```
1 character(len=12) :: strvar
2 !! ...
3 strvar = "word"
4 print
   *,len(strvar),len(trim(strvar))
```

Output:

12

4

3. String concatenation

Code:

```
1 character(len=10) ::  
    firstname,lastname  
2 character(len=15) ::  
    shortname,fullname  
3 !! ...  
4 firstname = "Victor"; lastname =  
    "Eijkhout"  
5 shortname = firstname // lastname  
6 print *, "without trimming:  
    ",shortname  
7 fullname = trim(firstname) // " "  
    // trim(lastname)  
8 print *, "with trimming: ",fullname
```

Output:

```
without trimming:  
    Victor    Eijkh  
with trimming: Victor  
    Eijkhout
```

Formatting

4. Integer formatting

Code:

```
1 i = 56
2 print *,i
3 print '(i4)',i
4 print '(i2)',i
5 print '(i1)',i
6 i = i*i
7 print '("fit <",<i0,> ted"',i
```

Output:

```
56
56
56
*
fit <3136> ted
```

5. String formatting

String in the format spec:

```
print '(i2,"--",i2)', m,n
```

Explicit a specifier:

```
print '(a5,i2)', somestring, someint
```

Use only the required space:

```
print '(a,i0,a)', str1,int2,str3
```


6. Repeated formats

Code:

```
1 i = 12; j = 34
2 print '(2i4)',i,j
3 print '(2i2)',i,j
```

Output:

```
12 34
1234
```

Code:

```
1 i = 23; j = 45; k = 67
2 print '(i2,1x,i2)',i,j
3 print '("Numbers:",3(1x,i2,"."))',
    i,j,k
```

Output:

```
23 45
Numbers: 23. 45. 67.
```

Character conversion

7. Conversion char to ascii

Code:

```
1 print *, "97 is a:", char(97)
2 print *, "84 is T:", char(84)
3 print *, "53 is 5:", char(53)
4 print *, "11 is VT :", char(11), "."
```

Output:

```
97 is a:a
84 is T:T
53 is 5:5
11 is VT :
.
```

Note the last one!

8. Ascii code of a character

```
character :: char
integer  :: code

char = "x"
code = iachar(char)
print *,char," has code",code
```

Exercise 1

Write a test to see if a character is lowercase:

Code:

```
1 print *, "lower t", islower("t")
2 print *, "lower T", islower("T")
3 print *, "lower 3", islower("3")
```

Output:

```
lower t T
lower T F
lower 3 F
```

Similarly, write a test *isdigit*.

String conversion

9. Read / Write

Fortran Read / Write:

`Read(fromwhere, how) what`

`Write(towhere, how) what`

with

- *from/towhere* is a 'unit', meaning file, and * is terminal;
- or *from/towhere* is a character string;
- *how* is a format string
- *what* is a bunch of variables

10. Parse date string

Code:

```
1 character(len=8) :: date
2 integer :: year,month,day
3 date = "20221027"
4 read( date,'( i4,i2,i2 )' ) &
5     year,month,day
6 !! ...
7 print *, "Date:", date
8 print '( "Year=",i4," ", mo=",i2," ",
9     day=",i2 )', &
10    year,month,day
```

Output:

```
Date:20221027
Year=2022, mo=10, day=27
```


11. Date quantities to string

Code:

```
1 character(len=10) :: longdate
2 !! ...
3 write( longdate,&
4      '( i4,"/",i2,"/",i2 )' &
5      ) year,month,day
6 print *, "Long date:", longdate
```

Output:

Long date:2022/10/27