

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:

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

Output:

```
12
4
```

3. String concatenation

Code:

```
character(len=10) ::  
    firstname,lastname  
character(len=15) ::  
    shortname,fullname  
!! ...  
firstname = "Victor"; lastname =  
    "Eijkhout"  
shortname = firstname // lastname  
print *, "without trimming: ", shortname  
fullname = trim(firstname) // " " //  
    trim(lastname)  
print *, "with trimming: ", fullname
```

Output:

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

String formatting

4. Integer formatting

Code:

```
i = 56
print *,i
print '(i4)',i
print '(i2)',i
print '(i1)',i
i = i*i
print '("fit <",<i0,"> ted"',i
```

Output:

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

5. String formatting

In the format spec:

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

Explicitly:

```
print '(a5,2)', somestring, someint
```

Use only the required space:

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


6. Repeated formats

Code:

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

Output:

```

              12
            34
        12  34
1234
```

Code:

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

Output:

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

Character conversion

7. Conversion char to ascii

Code:

```
print *, "97 is a:", char(97)
print *, "84 is T:", char(84)
print *, "51 is 3:", char(53)
print *, "08 is VT :", char(11), ". "
```

Output:

```
97 is a:a
84 is T:T
51 is 3:5
08 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:

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

Output:

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

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:

```
character(len=8) :: date
integer :: year,month,day
date = "20221027"
read( date,'( i4,i2,i2 )' ) &
    year,month,day
!! ...
print *, "Date:", date
print '( "Year=",i4," ", mo=",i2," ,
    day=",i2 )', &
    year,month,day
```

Output:

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


11. Date quantities to string

Code:

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

Output:

Long date:2022/10/27