



Computers in Engineering

COMP 208

Characters and Strings

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Characters

- ✿ A Character holds one byte of information
- ✿ It is usually a numeric to symbol representation mapping from values between 0 and 255
- ✿ The mapping standard used is called ASCII



Strings

- ✱ Strings are what we call an array of characters
- ✱ The characters in our string are stored sequentially in memory
- ✱ We can use strings to store messages and textual data



Data Type Character

- ✱ We have seen character string constants in examples.

```
"Hello World"
```

- ✱ FORTRAN allows us to declare variables that can hold character string values

```
CHARACTER (LEN=5) :: message_1
```

```
CHARACTER (LEN=20) :: message_2
```

- ✱ We can assign values to these variables.

```
message_1 = "Hello World"
```

```
message_2 = "Hello World"
```

Data Type Character

- ✱ What happens if we assign values that don't match the declared length

```
CHARACTER(LEN=5) :: message_1
CHARACTER(LEN=20) :: message_2
message_1 = "Hello World"
message_2 = "Hello World"
```

- ✱ If the length is too short, the string is truncated

```
message_1 contains "Hello"
```

- ✱ If it is too long it is padded with extra blanks

```
message_2 contains "Hello World_____"
```

Operations on Strings

- ✱ Comparison done using relational operators
<, >, <=, >=, ==, !=
- ✱ The ordering for comparison is called lexicographic (or dictionary) ordering
- ✱ A string is less than another if it would come first in the dictionary

BAG < HAG < HAT < HEAT



Combining Strings

- ✱ Concatenation (//)
- ✱ We can join two strings together by concatenating them

```
CHARACTER(len=21) :: instructor
CHARACTER(len=8)  :: surname
surname = "Friedman"
instructor = "Prof. " // "Nathan " // surname
```