CS-216 - APL

L Sessions

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Sch Id: 1912160

Branch: CSE-B

B.Tech 4th Sem.

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R Programming

> Open Source Programming language
> Used for Statistical Computing

Features of R Programming

> Free and Open Source
> Easy to learn. No Prior coding knowledge required.
> Various data structures and operators.
> Integrable with other programming languages like C, Cpp, Java, Python.
> Consists various inbuilt packages.

Varizables in R.

> Used to store data with named locations.
> Combination of letters, digits, period and underscore.

Valid	Invalid
total	tot@1
Sum	5um
.count	_count
.count.total	TRUE
.Var	.0ar

> Case Sensitive.

R Installation Guide:

R-base > r-project.org → Download → 0-Cloud
→ Download R for {OS} → base → Download.

R-Studio > [redacted] & rstudio.com → Download →

Examples:

> Storing integer value in a variable.

```
> var <- 5L
> var
[1] 5
```

> Storing char value in a variable

```
> var <- 'character'
> var
[1] "character"
```

> Storing string value in a variable

```
> var <- "This is String"
> var
[1] "This is String"
```

Data Types in R.

1. Logical → TRUE, FALSE
2. Numeric → 10.5, 7, 845
3. Integer → 3L, 402L, 4L
4. Complex → 3+2i
5. Character → 'a', 'hello', '13.5'
6. Raw → 'Hello' is stored as 48 65 6c 6c 6f

Logical Operators:

1. And &
   > 10 > 20 & 10 < 20
   [1] FALSE

2. Or |
   > 10 > 20 | 10 < 20
   [1] TRUE

3. Not !
   > !(10 > 20 & 10 < 20)
   [1] TRUE

Arithmetic Operators:

1. Addition. +
2. Subtraction -
3. Multiplication *
4. Division /
5. Remainder / Modulus %%
6. Exponent

Order of Operations:

P	E	D	M	A	S
Parenthesis	Exponent	Division	Multiplication	Addition	Subtraction
()	^	/	*	+	-

Rational Operators:

1. Greater than >
2. Less than <
3. Greater than / equal >=
4. Less than / equal <=
5. equal to !=
6. Not equal to ==

Print formatting : print()

```
> x ← 10
> print (x)
[1] 10
```

Paste() and pasteO() :

```
> paste ("Hello", "World")
[1] "Hello World"
> pasteO ("Hello", "World")
[1] "HelloWorld"
```

R Objects :

Eg. Vectors, Lists.

Vectors :

> Sequence of data elements of same type.

> c( ) function to declare vector

Eg.:

```
> v1 ← c (1, 2, 3, 4, 5)
> print (v1)
[1] 1 2 3 4 5
> v2 ← c ('red', 'green', 'blue')
> print (v2)
[1] "red" "green" "blue"
> class (v1)
[1] "numeric"
> typeof (v1)
[1] "double"
```