C Syntax

Overview

- Developed between 1969-1973 by Dennis Ritchie at Bell Labs for use w/ Unix
- Intended for implementing system software, used for application software
- Basis for C++, C#, Objective C, Java, Perl, PHP, Python, etc.

Characteristics

- Partially weak typing; for instance, characters can be used as integers
- Low-level access to computer memory via pointers
- Complex functionality such as I/O, string manipulation, and mathematical functions via library routines
- A relatively small set of reserved keywords

“Same as Java” syntax

Comments

/* comment */

// single line comment

Assignments & Blocks

- Assignment:

  i= i+j;

- Block:

  { *statement 1*;
  statement 2; }

Conditional Statements

- If:

  if (*expression*) *statement;*
  else if *(expression) statement;*
  else *statement;*

- Switch:

  switch (x) {
  case 1: *statement*; **break;**
  …
  default: *statement*; }

Loops

- For:

  int i; /*explicity declare iteration var */
  for (i=initial value; i<=last value; i++)
  statement;

- While:

  while (i < value) *statement;*

- Loop termination:

  break;

Function/Procedure Calls

- Function call:

  x = m(y,z)

- Procedure call:

  m(y,z)

Equality & Operators

- Equality:

  ==

- Inequality:

  !=

- Logical operators:

  &&, & (logical-and)

  ||, | (logical-or)

  ! (logical-complement)

- Arithmetic operators:

  unary -, +, -, *, / (div), % (mod)

Differences in Syntax

Library/Package Usage

- Java:

  import java.util.Scanner;

- C:

  #include <stdio.h>

Standard Input

- Java:

```
Scanner scanner = new Scanner(System.in);
int x = scanner.nextInt();
double f = scanner.nextFloat();
String s = scanner.next();
```

- C:

```
int x; float y; char *z;   /* z is a string */
scanf(“%d”, &x);
scanf(“%f”, &y);
scanf(“%s”, z);
```

Standard Output

- Java:

  System.out.println("The character “+c+” has ASCII value “+int(c))**;**

- C:

  printf(“The character %c has ASCII value %d\n”, c, (int)c);

Bottom-up Approach

- “main” function should be declared last in order to call other functions (unless functions prototyped):

  void procedure1{…}

  int function1{…}
  …
  int main(){…}