

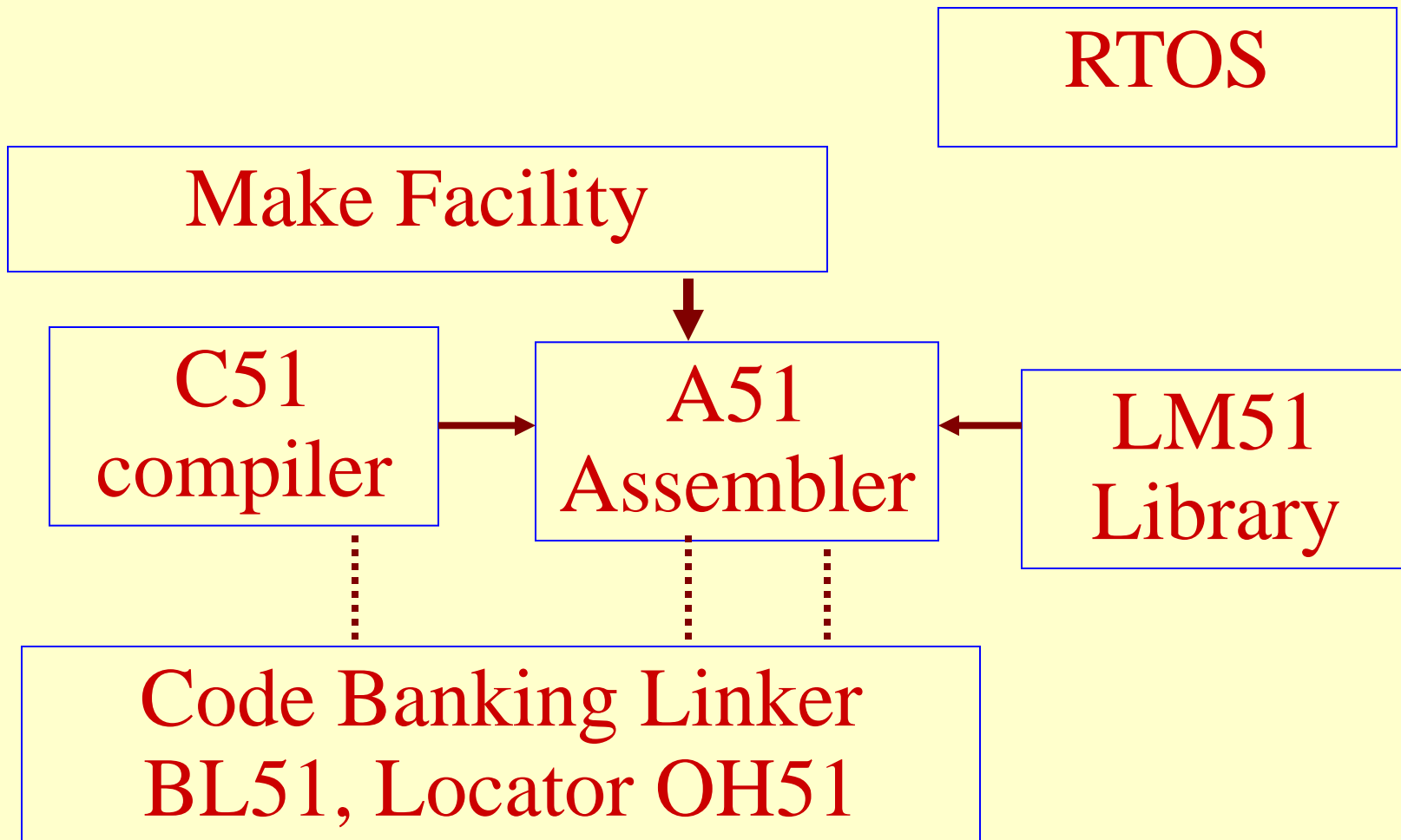
# **Chapter 12**

## **Development Tools for Microcontroller Applications**

# Lesson 5

## **Keil $\mu$ Vision 2 IDE– Compiler, Assembler, Library Manager, Linker/Locator and Hex-Converter**

# $\mu$ Vision 2 IDE Make Facility



# C51- C Compiler

## Cross Compiler

fast,compact, optimised  
and efficient codes

Automatic generation of  
efficient code

ANSI C plus  
8051 Specific  
Features

Robust Editor-  
Interactive  
error correction

# 8051 Specific Features

6 sp. memory types

14 data types for  
8051 specific data

3 memory models

8-bit and 16-bit two  
pointers

4 code-generation  
options

.asm as well as  
.obj file and  
Intel object  
format file

Three functions-  
generic C,  
reentrant and  
interrupt (ISR)

RTOS RTX-51  
Support

# **3 Memory Models**

**Internal RAM only-Small model**

**256 B external RAM- Compact model**

**All available memory- Large model**

# 4 Options for Code generation

Program code size minimise

Program execution speed minimise

Code independent of register banks

Parameter passing in local segments in  
place of register banks

# 8051 specific Data Types

## C51

bit

signed char

unsigned  
char

sbit

unsigned short

sfr

sfr16

signed short



# Code optimisation Feature

Use register variables

Constants folding

Reuse common entry code

Eliminate common sub expressions

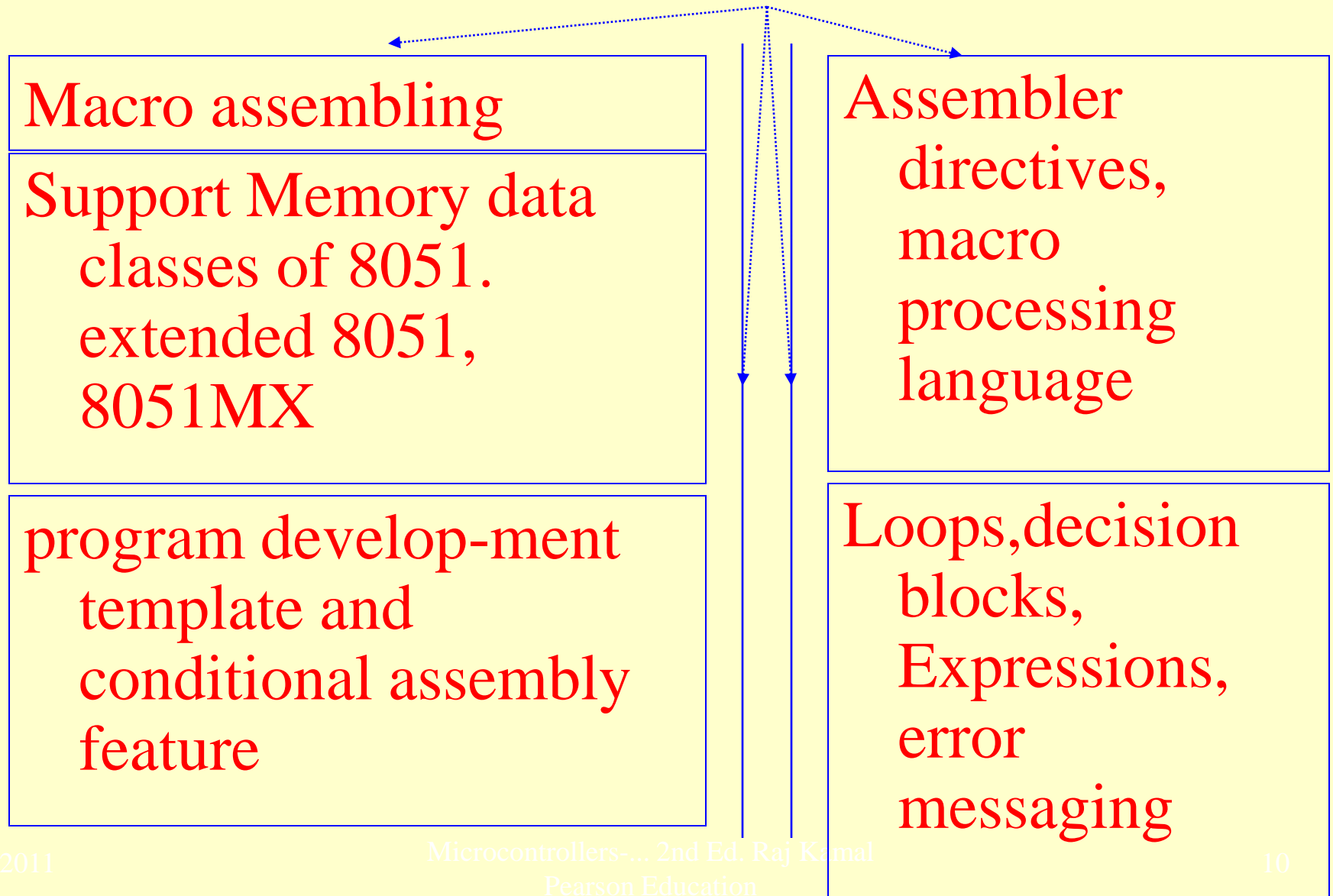
Computing constants for expressions

Branching optimisation

Replace complex operations by simple ones

Overlaying of bits and data segments

# Assembler A51 Features



# Library Manager LM 51 Features

Uses LIB 51- large number of object modules for common sets of applications

Combines and provide distributable reference collections

Security, Speed, Minimise disk space

Also controllable by IDE

Target output IDE option for 'Create Library' to create future reference

# BL 51- Code Bank Linker

A51, C51,  $\mu$ Vision 2  
source files Linking

Intel ASM51 files

RTX51 RTOS files

overlay variables in  
internal RAM for  
mutually exclusive  
functions

8051 code banks ,  
32 x 64 kB code  
banks support

Re-locatable file

Absolute file  
option

Errors Messaging

# Four Controls in BL51

Segment and location control

High level language control

Output file control

Listing file control

# OC 51- object code generation

Creates .abs file for each code bank

Creates symbolic debugging information for use by ICE or debugger

Convertible to hex file using OH51

# **OH51- Converter into hex file**

- ASCII file with hexadecimal representation
  - Intel Hex format standard
  - Provides a device programmer input for final code location

# Summary



We learnt

**IDE Vision 2 IDE powerful featured**

- **Compiler,**
- **Assembler,**
- **Library Manager,**
- **Linker/Locator and Hex- Converter**

End of Lesson 05 on

**Keil  $\mu$ Vision 2 IDE– Compiler,  
Assembler, Library Manager,  
Linker/Locator and Hex-Converter**