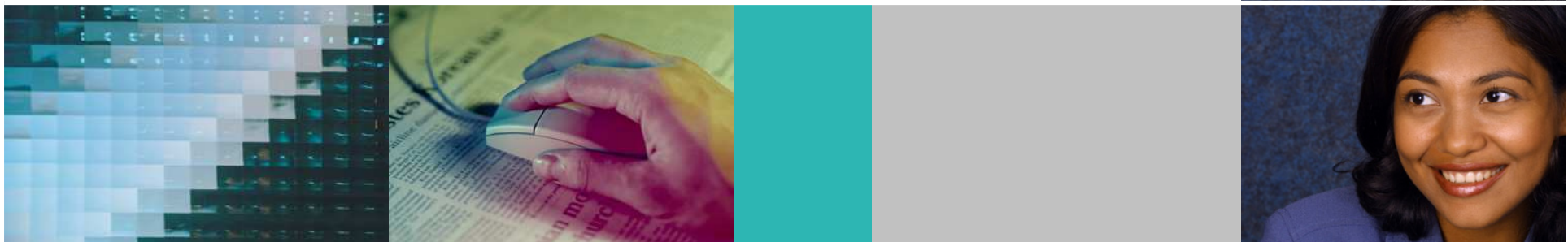# Derived Data Types

- Derived data types are arrays, pointer, structs and unions

- … a chapter on derived data type will follow later …

Table of contents
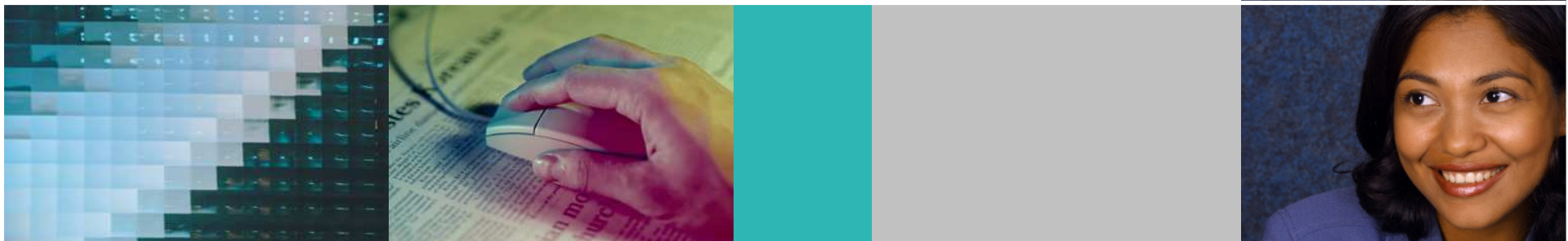
Variables

"There are two different kinds of variable conventions / directives:
    - definitions
    - declarations"

very important

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Variables

"Variable definition decides on the kind of a
variable:
  - type
  - memory classification
  - variable attributes
  - and allocates memory space"

Variable Definition

"Variable declaration will only define the
kind of a variable:
  - class type
  - interfaces of functions"

Variable Declaration

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Variables

- **examples of variable definitions**

```
data type  name {, name};


char c;

int i, j, k;

float z;

double z_double;
```

The first one is a universally valid form – not C-code.
This is called Extended Backus-Naur-Form (EBNF).

Variables

If we talk about variables we have to differentiate

- visibility of variables

- length of life / durability

- local variables

- external variables

Very important terms. I think this could be question about theory in the class exam in February, couldn't it?

Visibility of Variables

"Visibility means that the program part can see the variable. If a program part can see a variable it has access to it by using the variable's name"

Visibility

Length of Life / Duration

"The variable's length of life is the period of time the variable needs allocated memory space what has been made available by the runtime environment."

Length of Life / Duration

During it's lifetime the variable uses memory space. Use the variable so memory space is not wasted.

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Local Variables

"A local variable starts it's lifetime with the beginning of a function and will be destroyed at the function's endpoint. A local variable cannot be used outside the function where it is defined in."

Local Variables

A: "Oh no! Another clever saying. Stop this!"
B: "Only this and another one then we have finished."

External Variables

"External variables are alive during the whole program. They waste memory space all the time until the program terminates.
All functions can see those external variables and have access to them.
They are often origin of logical errors!"

External Variables

External variables are often called global variables.

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