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**LAB 05. TYPE CHECKING**

This report includes

1. Result of running project with example4.kpl
2. Result of checking if character comparisons can be used in a condition or not.
3. Result of checking if a character variable can be used to control a for loop or not.
4. The following error cases with analysis:

type inconsistency with a constant declaration

type inconsistency in an assignment statement when the LHS is

* an indexed variable
* a parameter
* a function

type inconsistency in a condition

type  inconsistency in a for statement

**A, Result of running project with example4.kpl**

A screenshot of a computer program

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**B, Result of checking if character comparisons can be used in a condition or not.**

|  |
| --- |
| PROGRAM yeucau2;  Var ch: Char;  Begin  ch := 'a';  If ch = 'b' Then Call WRITELN;  End. |

A screen shot of a computer

AI-generated content may be incorrect.

**C, Result of checking if a character variable can be used to control a for loop or not**.

|  |
| --- |
| PROGRAM yeucau3;  Var ch: Char;  Begin  For ch := 'a' To 'z' Do Call WRITELN;  End. |

A screen shot of a computer

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**D, The following error cases with analysis:**

1. **Type inconsistency with a constant declaration**

|  |
| --- |
| PROGRAM yeucauD1;  CONST  MyConst = 'C';  Var N : INTEGER;  BEGIN  N := MyConst;  END. |

**A screen shot of a computer

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**Analysis:**

* The constant MyConst is assigned a character ('C'), so the type of MyConst is CHAR
* Assigning a character to an integer variable N would violate type consistency.

1. **Type inconsistency in an assignment statement when the LHS is**
   1. **An indexed variable**

|  |
| --- |
| PROGRAM yeucauD21;  Var A: ARRAY(.10.) OF Integer;  Begin  A(.1.) := 'x';  End. |

**A screenshot of a computer

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**Analysis:**

* The array A stores integer elements.
* Assigning a char ('x') to A(.1.) violates the array’s element type.
  1. **A parameter**

|  |
| --- |
| PROGRAM yeucauD22;  Procedure P(x: Integer);  Begin  x := 'z';  End;  Begin  End. |

**A screenshot of a computer

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**Analysis:**

* Parameter x is declared as integer.
* Assigning a char ('z') to x violates type consistency.
  1. **A function**

|  |
| --- |
| PROGRAM yeucauD23;  Function F(n : Integer): Integer;  Begin  F := 'a';  End;  Begin  End. |

**A screenshot of a computer program

AI-generated content may be incorrect.**

**Analysis:**

* Function F returns integer, but 'a' is a char.
* Fix: Return an integer (e.g., F := 100;).

1. **Type inconsistency in a condition**

|  |
| --- |
| PROGRAM yeucauD3;  Var x: Integer;  y: Integer;  Begin  If x = 'a' Then Call WRITELN;  End. |

**A screenshot of a computer program

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**Analysis:**

* x is integer, while 'a' is char.
* The condition x = 'a' compares incompatible types.

1. **Type inconsistency in a for statement**

|  |
| --- |
| PROGRAM yeucauD4;  Var ch: Char;  x: Integer;  Begin  For ch := 1 To 10 Do Call WRITELN;  End. |

**A screen shot of a computer

AI-generated content may be incorrect.**

**Analysis:**

* Loop variable ch is char, but the range (1 to 10) uses integer values.
* Fix: Use char bounds (e.g., For ch := 'a' To 'z' Do ...).