

Name: Nguyen Huu Hoang Hai Anh

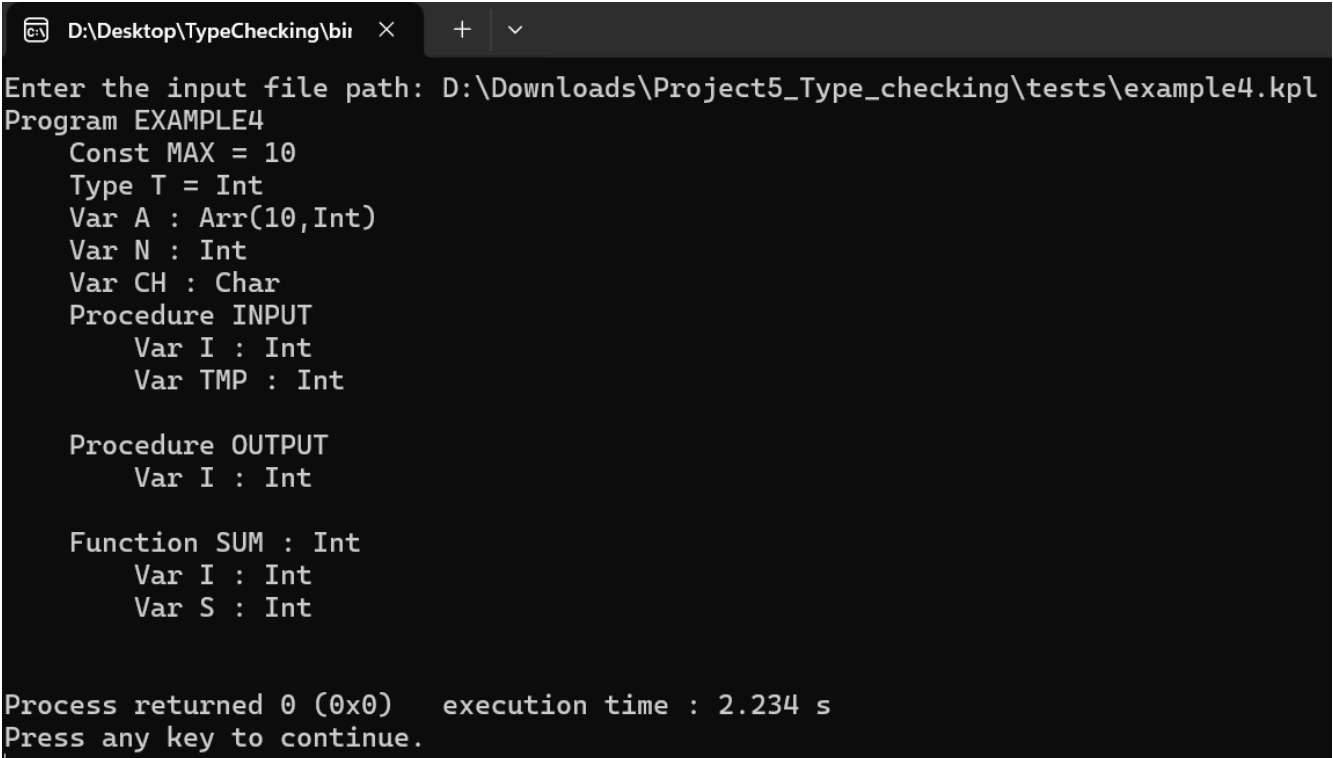
Student ID: 20226010

LAB 05. TYPE CHECKING

This report includes

- A. Result of running project with example4.kpl
- B. Result of checking if character comparisons can be used in a condition or not.
- C. Result of checking if a character variable can be used to control a for loop or not.
- D. 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



```
D:\Desktop\TypeChecking\bin  ×  +  ▾
Enter the input file path: D:\Downloads\Project5_Type_checking\tests\example4.kpl
Program EXAMPLE4
  Const MAX = 10
  Type T = Int
  Var A : Arr(10,Int)
  Var N : Int
  Var CH : Char
  Procedure INPUT
    Var I : Int
    Var TMP : Int

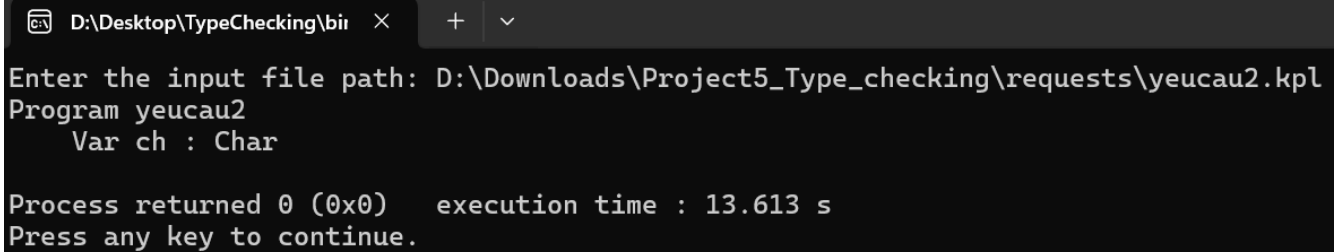
  Procedure OUTPUT
    Var I : Int

  Function SUM : Int
    Var I : Int
    Var S : Int

Process returned 0 (0x0)   execution time : 2.234 s
Press any key to continue.
```

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

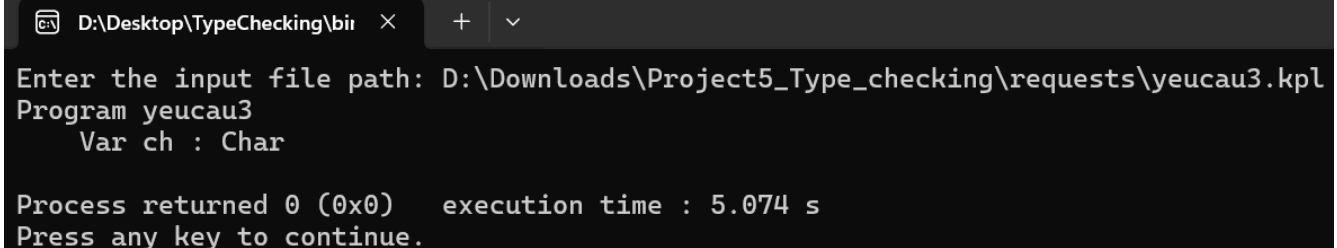
```
PROGRAM yeucau2;  
Var ch: Char;  
Begin  
    ch := 'a';  
    If ch = 'b' Then Call WRITELN;  
End.
```



```
D:\Desktop\TypeChecking\bir x + v  
Enter the input file path: D:\Downloads\Project5_Type_checking\requests\yeucau2.kpl  
Program yeucau2  
    Var ch : Char  
  
Process returned 0 (0x0)    execution time : 13.613 s  
Press any key to continue.
```

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.
```



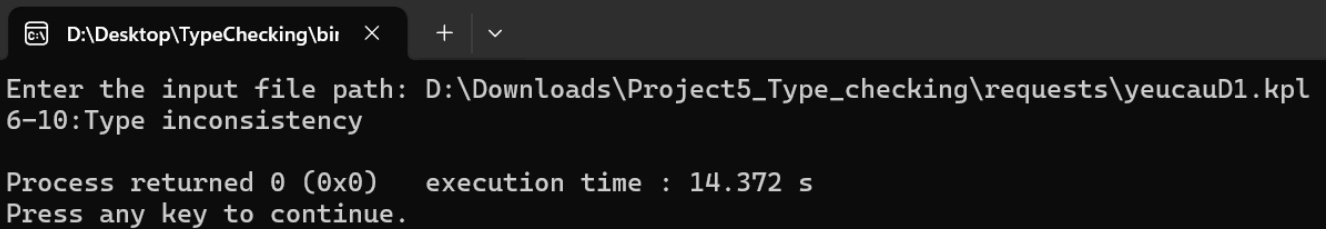
```
D:\Desktop\TypeChecking\bir x + v  
Enter the input file path: D:\Downloads\Project5_Type_checking\requests\yeucau3.kpl  
Program yeucau3  
    Var ch : Char  
  
Process returned 0 (0x0)    execution time : 5.074 s  
Press any key to continue.
```

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.
```

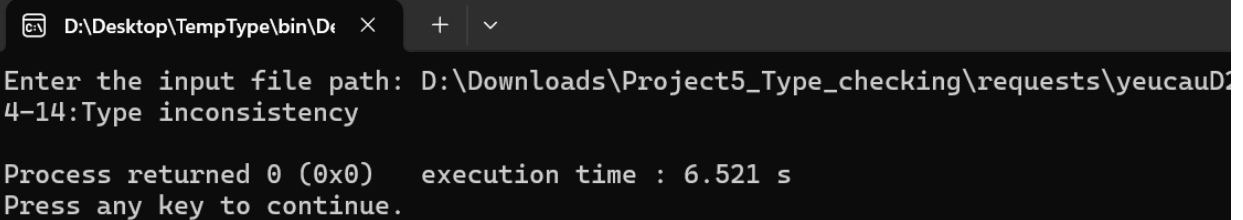


```
D:\Desktop\TypeChecking\bin\ × + ▾  
Enter the input file path: D:\Downloads\Project5_Type_checking\requests\yeucauD1.kpl  
6-10:Type inconsistency  
  
Process returned 0 (0x0) execution time : 14.372 s  
Press any key to continue.
```

2. Type inconsistency in an assignment statement when the LHS is

2.1. An indexed variable

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



```
D:\Desktop\TempType\bin\D × + ▾  
Enter the input file path: D:\Downloads\Project5_Type_checking\requests\yeucauD21.kpl  
4-14:Type inconsistency  
  
Process returned 0 (0x0) execution time : 6.521 s  
Press any key to continue.
```

2.2. A parameter

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

```
D:\Desktop\TempType\bin\Dc  x + v
Enter the input file path: D:\Downloads\Project5_Type_checking\requests\yeucauD2
4-9:Type inconsistency

Process returned 0 (0x0)   execution time : 4.772 s
Press any key to continue.
|
```

2.3. A function

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

```
D:\Desktop\TempType\bin\Dc  x + v
Enter the input file path: D:\Downloads\Project5_Type_checking\requests\yeucau
4-9:Type inconsistency

Process returned 0 (0x0)   execution time : 5.381 s
Press any key to continue.
|
```

3. Type inconsistency in a condition

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

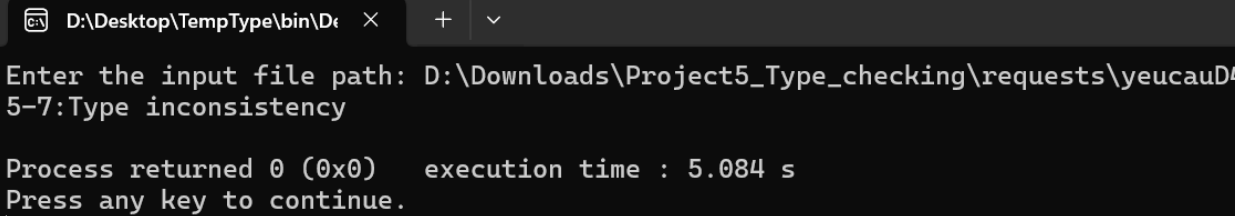
```
D:\Desktop\TempType\bin\Dc  x + v
Enter the input file path: D:\Downloads\Project5_Type_checking\requests\yeucauD3
5-11:Type inconsistency

Process returned 0 (0x0)   execution time : 5.005 s
Press any key to continue.
|
```

4. Type inconsistency in a for statement

```
PROGRAM yeucauD4;
```

```
Var ch: Char;  
    x: Integer;  
Begin  
    For ch := 1 To 10 Do Call WRITELN;  
End.
```



The screenshot shows a terminal window with a dark background. At the top, there is a tab labeled 'D:\Desktop\TempType\bin\D...' with a close button. Below the tab, the text 'Enter the input file path: D:\Downloads\Project5_Type_checking\requests\yeucauD...' is visible, followed by '5-7:Type inconsistency'. The next line shows 'Process returned 0 (0x0) execution time : 5.084 s'. The final line says 'Press any key to continue.' with a cursor at the end.

```
Enter the input file path: D:\Downloads\Project5_Type_checking\requests\yeucauD  
5-7:Type inconsistency  
  
Process returned 0 (0x0)   execution time : 5.084 s  
Press any key to continue.  
|
```