

DEPT. OF COMPUTER SCIENCE, DU



Parser Project **Java: for each loop**

Group Members:

- **Prabhu Tiwari (35)**
- **Prashu Chaudhry (38)**
- **Sawan Kumar (49)**

Course: M.C.A

Subject: Compiler Design

Semester: IV

Submitted To: Dr. Ankit Rajpal

Report:

1. Syntax:

```
for(datatype variableName : collectionClassName)
{
    body of the loop
}
```

example:

```
for(int element : array1)
```

2. Assumptions:

- Parsing is performed over 'for' and the content inside opening parenthesis and closing parenthesis in the syntax part.
- Parser considers type inference achieved by 'var' keyword. 'var' automatically detects the datatype of a variable based on the surrounding context. This will cover the parsing of collection class which consists of collection of objects of a user-defined class.

3. **Test cases:**

- Valid test cases:
 - **for(var element : collectionClass)**
 - **for(byte b : array1)**
 - **for(short s: shortArray)**
 - **for(int n : arrayOfIntegers)**
 - **for(long l : longArray)**
 - **for(boolean b : booleanArray)**
 - **for(char ch: characterArray)**
 - **for(String s: arrayOfStrings)**
 - **for(float f: arrayOfFloatingPointNumbers)**
 - **for(double d: arrayOfDoubleTypeValues)**

C:\Windows\System32\cmd.exe - a.exe

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
for(var element : collectionClass)  
Syntax Correct
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
for(byte b : array1)  
Syntax Correct
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
for(short s: shortArray)  
Syntax Correct
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
for(int n : arrayOfIntegers)  
Syntax Correct
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
for(long l : longArray)  
Syntax Correct
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
for(boolean b : booleanArray)  
Syntax Correct
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
for(char ch: characterArray)  
Syntax Correct
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
for(String s: arrayOfStrings)  
Syntax Correct
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
for(float f: arrayOfFloatingPointNumbers)  
Syntax Correct
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
for(double d: arrayOfDoubleTypeValues)  
Syntax Correct
```

- **Invalid test cases:**

- **for(element var : collectionClass)**
- **for(byte: b array1)**
- **for()short s: shortArray**
- **for(arrayOfIntegers : int n)**
- **(long l :longArray)for**
- **for(int i; i<n; i++)**
- **for(boolean : booleanArray b)**
- **(for) char ch: characterArray**
- **FOR(String s: arrayOfStrings)**
- **for(float f ;arrayOfFloatingPointNumbers)**
- **For(double d: arrayOfDoubleTypeValues)**

C:\Windows\System32\cmd.exe

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
for(element var : collectionClass)  
error: syntax error
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
for(byte : b array1)  
error: syntax error
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
for()short s: shortArray  
error: syntax error
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
for(arrayOfIntegers : int n)  
error: syntax error
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
(long l : longArray)for  
error: syntax error
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
for(int i; i<n; i++)  
;error: syntax error
```

C:\Windows\System32\cmd.exe

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
for(boolean : booleanArray b)  
error: syntax error
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
(for) char ch: characterArray  
error: syntax error
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
FOR(String s: arrayOfStrings)  
error: syntax error
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
for(float f ; arrayOfFloatingPointNumbers)  
;error: syntax error
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>a.exe  
For(double d: arrayOfDoubleTypeValues)  
error: syntax error
```

```
C:\Users\Sawan Kumar\Desktop\Flex programs\Project>_
```

4. Capabilities:

- The syntax of For-each loop of java can be parsed through this parser.
- Parser can parse the following datatypes in the syntax:
 - byte
 - short
 - int
 - long
 - boolean
 - char
 - String
 - Float
 - Double
- Parsing can also be performed on the user defined datatypes where type inference is used with the help of 'var' keyword.

5. Limitations

- Parser skips parsing the body of the For-each loop.
- Parsing cannot be performed on user defined data types which does not uses type inference through 'var' keyword.