

Lecture 03

Language Evaluation Criterion

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Previous Lecture Summary

- **Programming Language**
- **Types of Languages**
- **Language Categories**
- **Language Levels**
- **Language Translators**
- **Programming Errors**

Outline

- 1. Capers Jones Table**
- 2. Hello World (BASIC, LISP, C, C++)**
- 3. Language Evaluation Criterion**

Programming Languages Table

Capers Jones

Language Level Relationship to Productivity

LANGUAGE LEVEL	PRODUCTIVITY AVERAGE PER STAFF MONTH
1 - 3	5 to 10 Function Points
4 - 8	10 to 20 Function Points
9 - 15	16 to 23 Function Points
16 - 23	15 to 30 Function Points
24 - 55	30 to 50 Function Points
Above 55	40 to 100 Function Points

Assembly(1), C(2.5), Pascal(3.5), LISP(5), BASIC(5), C++(6)

Hello World Programs

from: Infiltec Humor Page
www.infiltec.com

High School/Jr.High – BASIC
2 lines

```
10 PRINT "HELLO WORLD"  
20 END
```

Senior year in College - LISP

3 lines

```
(defun hello  
  (print  
    (cons 'Hello (list 'World))))
```

New professional – C

10 lines

```
#include
void main(void)
{
    char *message[ ] = {"Hello ", "World"};
    int i;
    for(i = 0; i < 2; ++i)
        printf("%s", message[i]);
    printf("\n");
}
```

Seasoned professional – C++

```
#include
```

```
#include
```

```
int main()
```

```
{
```

```
    String str;
```

```
    str = "Hello World";
```

```
    cout << str << endl;
```

```
    return(0);
```

```
}
```


Language Evaluation Criteria

I have reaffirmed a long-standing and strongly held view: Language comparisons are rarely meaningful and even less often fair. A good comparison of major programming languages requires more effort than most people are willing to spend, experience in a wide range of application areas, a rigid maintenance of a detached and impartial point of view, and a sense of fairness.

Bjarne Stroustrup

Language Evaluation Criterion

- How to compare and examine languages?
- Base Criteria:
 - Readability
 - Writability
 - Reliability

Readability

- Directly related to the cost of maintenance
- Choice of language for a particular task
 - Simplicity
 - Orthogonality
 - Control Statements
 - Data types and data structures
 - Syntax Considerations

Readability - Simplicity

- Number of basic components
 - Learning curve
 - Subset can be used for writing but for reading you must know everything
- Feature multiplicity – more than one way to accomplish the same task.
 - `i = i + 1; i++; ++i; i += 1;`
- Operator overloading
 - problematic if inconsistent or unconventional
- How much simple should it be?

Summary

- ✓ **Capers Jones Table**
- ✓ **Hello World (BASIC, LISP, C, C++)**
- ✓ **Language Evaluation Criterion**