SRI RAMANUJAR ENGINEERING COLLEGE

DEPARTMENT OF
COMPUTER SCIENCE & ENGINEERING

SYSTEM SOFTWARE

INTERACTIVE DEBUGGING SYSTEM

By

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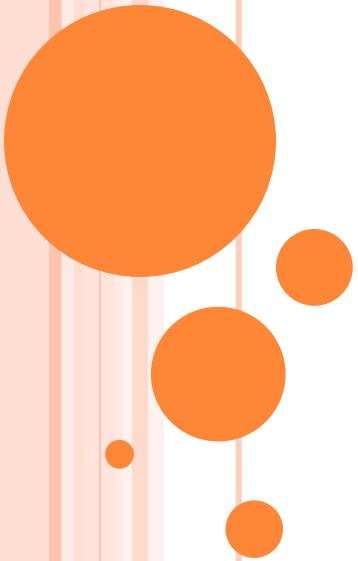
INTERACTIVE DEBUGGING SYSTEM

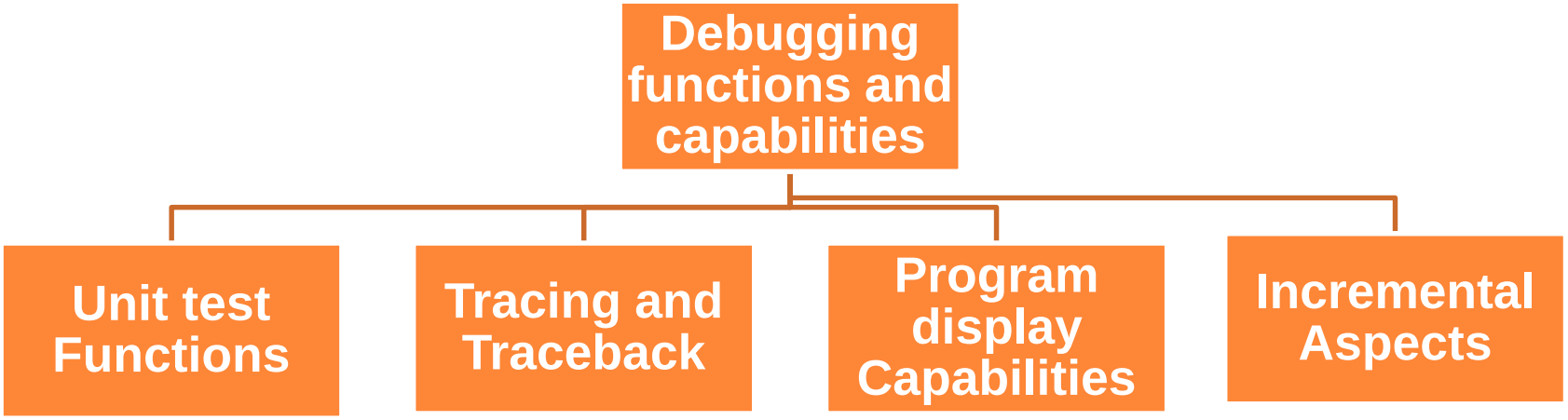


✓ What is Interactive debugging system?

The Interactive debugging system facilitates the programmers in testing and debugging of programs.

- ✓ Approaches to debugging
- Print statements
- Printing to log files
- Heap checking
- Reverse execution

Debugging functions and capabilities



Unit test functions

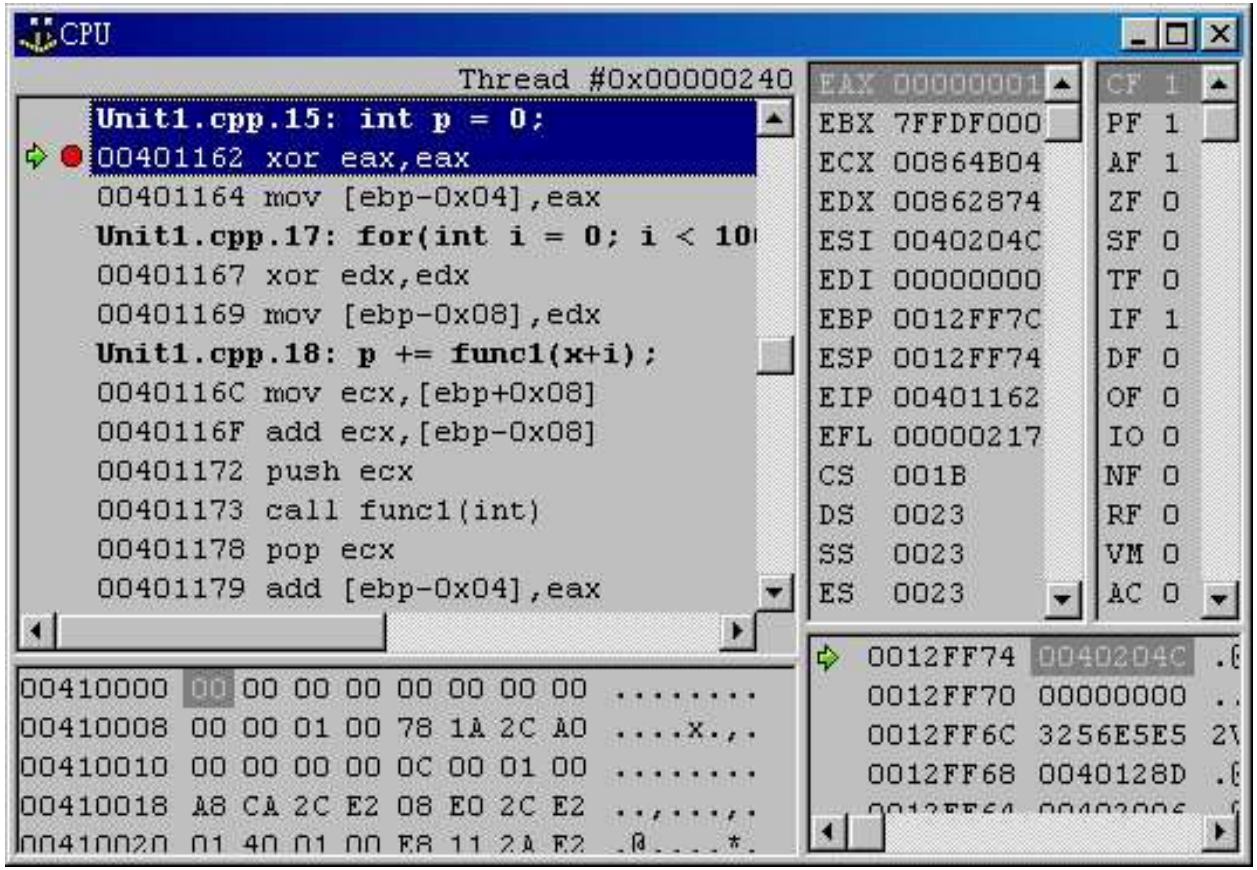
Functions	Execution sequencing	Break points	Conditional expression	Gaits
Definition	It is observation and control flow of program execution.	A break point cause the execution to be suspended .	Specified conditional expressions cause execution to be suspended.	Run the program in various speeds.
Conditions	Can be halted after a fixed number of instructions are executed.	Specific point program	When any of the condition become true as defined by user.	Runs in good graphical representation of a program
Program resumption	no	yes	no	no

Tracing and Traceback

Functions	Tracing	Traceback
definitions	Used to trace the flow of execution logic and data modifications	Shows the path by which the current execution of the statement is reached.
Conditions	Only after modifications	Path of current statement

Program display capabilities

- It displays the program being debugged with statement numbers.
- The user can control the level at which display occurs.



INCREMENTAL ASPECTS

What are the aspects ?

1. Modification during debugging.
2. Recompile incrementally during debugging.

What it should do ?

1. Save all the debugging specifications such as break points etc.
2. It must symbolically display or modify the content of variables and constants of a program and then continue execution.

How it helps ?

Programmer need not reissue all debugging commands.

Needs for Debugging System

1. Able to determine the language of program in which it is written so it must be language independent

2. It should get its context accordingly

When does a context used ?

Debugger switches using context when one program written in one language calls a program written in the other language.

Each context has its own effect

1.Assignment statements :

COBOL : MOV 3.5 TO A

FORTRAN : A = 3.5

2.Conditional expression:

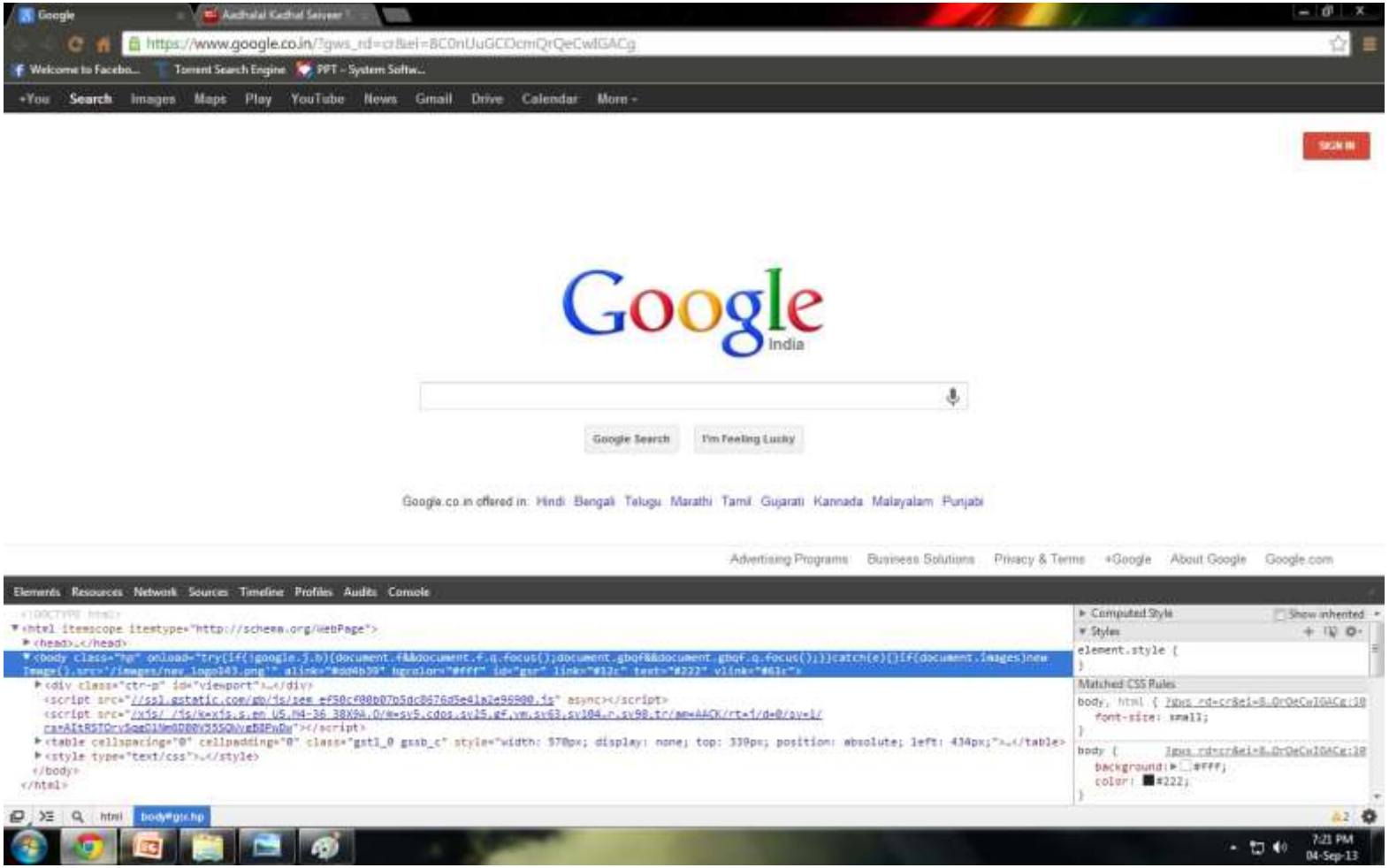
COBOL : IF A NOT EQUAL TO B

FORTRAN : IF (A.NE.B)

3.The notation used is based on the language being debugged.

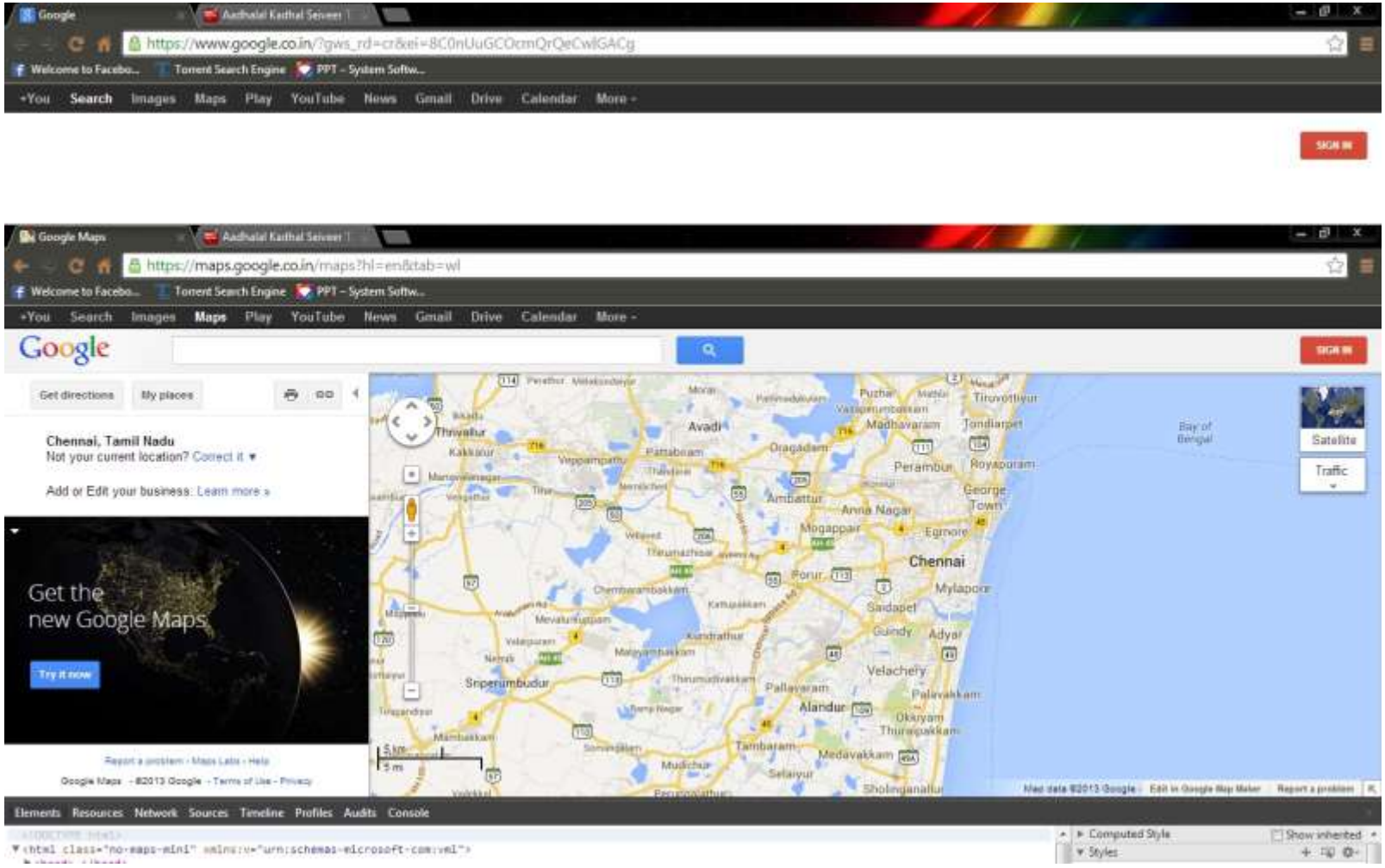
Example :

➢Press F12 for Development window



Language used : HTML with PHP code

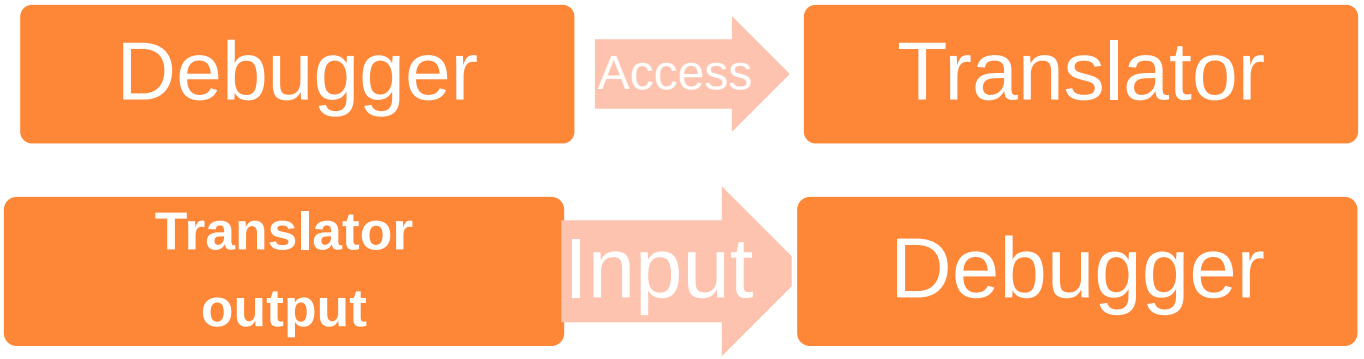
After clicking Maps button

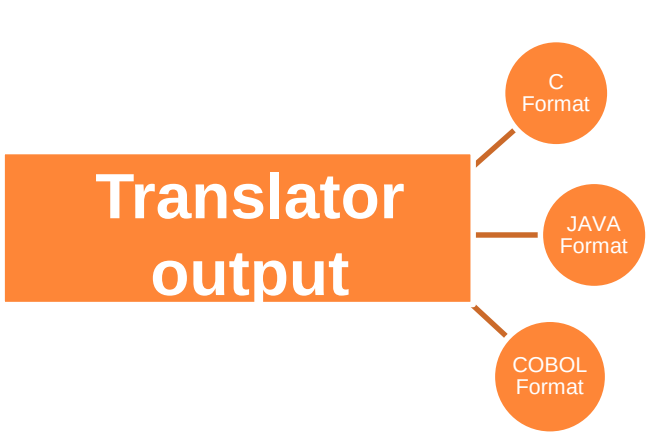


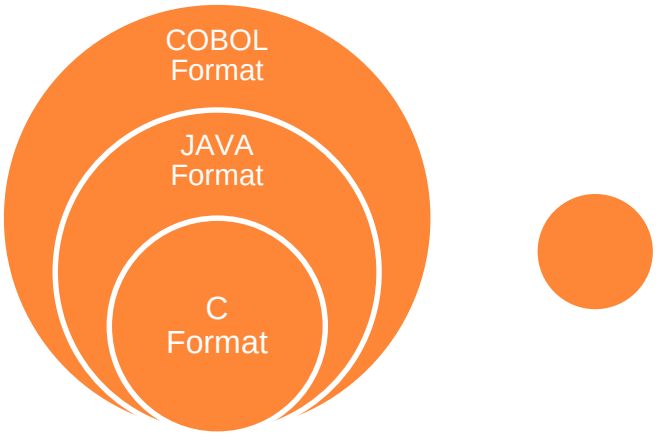
Language used: HTML with JAVA script

Language translator :

1. Debugger should have access to information collected by language translator.
2. Translators produce the required information in a standard external form regardless of internal form used in translator.
3. Interface modules that can respond to request for information in a standard way regardless of language.







Optimized code

What is optimized code?

The process of modifying the software system to make it to work more efficiently.

Uses:

1. Lower memory storage
2. Less power

How is it done ?

1. Invariant expressions can be removed form loop.
2. Separate loop can be combined into a single loop.
3. Redundant expressions can be eliminated.
4. Elimination of unnecessary branch instructions.

Disadvantages:

Due to code arrangement

1. Affect tracing
2. Affect Breakpoints
3. Affect Statement counts

Relationship with other Parts of the System

1.Runtime environment:

- Interactive debugger must be a part of runtime environment.

When an error is found immediate debugging must be possible.

Reason: Impossible to reproduce the failure in other environments.

2. Production environment:

- User should be able to debug in a production environment.

Cause: If a application fails during a program run , work dependent on that application stops.

3. Security and integrity:

- Specific authorization should be given.

Limits: 1. An unauthorized user cannot access any data.

2.Should not be possible to use debuggers to interfere with any aspect of system integrity

4.Language compilers and interpreters:

- Must co-ordinate its activities with existing and future language compilers and interpreters.

Existing : Maintained

Future : Install new upgrades

What are the Criteria for User-interface ?

1. User friendly.
2. Use Full screen display and windowing display
3. Use menu bars
   a.) Menus should have the heading of the task
   b.) Possible to go directly to menus and it should not entire hierarchy.
4. Command Language:
   a.)It must be clear, logical, simple syntax
   b.)Should minimize punctuations eg : { } , / , etc ….
5. Available Help Facility .


Backspace
Thank You
Page Up
Home
Page Down
Insert
Shift