

Course Introduction

15CSE220 :: SICP

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"I think it is extraordinarily import that we in computer science keep fun in computing." – Alan J Perils

What can be said about it that hasn't been said a thousand times before?

It is perhaps the single greatest computer science textbook.

It is renowned for its imaginative exercises and mind-blowing techniques.¹

¹<https://www.gwern.net/sicp/Introduction>

What does it teach?

It teaches:²

- Principles of Computer Programming
- Recursion
- Abstraction
- Modularity
- Program Language Design and
- Implementation

²https://en.wikipedia.org/wiki/Structure_and_Interpretation_of_Computer_Programs

What we are going to study?

"We are about to study the idea of computational process".³

We are going to understand about:

- *Computational Process.*
- *Processes* that manipulate *data*.
- pattern of rules called *program*.⁴

³p 1; SICP book

⁴In our case procedures.

LISP - Our Language

Just as:

- our everyday thoughts are expressed by natural languages,
- descriptions and quantitative phenomena are expressed by mathematical notations,

Our procedural thoughts will be expressed in Lisp.

Why Lisp?

If Lisp is not a mainstream language, why are we using it as the framework for our discussion on programming?

Because the language possesses:

- excellent medium for studying important programming constructs,
- data structures, and
- a medium to relate them.

More precisely Scheme

- Scheme, a dialect of Lisp
- Invented by Guy Lewis and Gerald Jay Sussman at MIT in 1975.
- Re-implemented for instructional use later.

Minimal Syntax

- Scheme has minimal syntax.
- Very few primitive procedures (less than 10)
- Good for building bigger applications by composing smaller procedures.

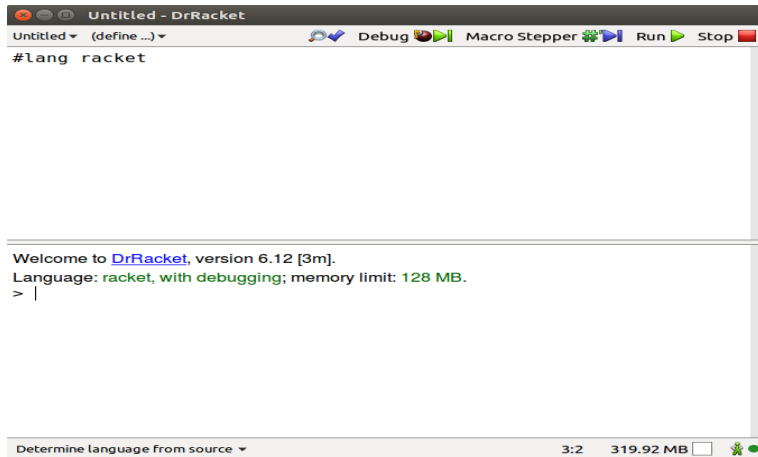
Our Development Environment

- Dr.Racket⁵
- Powerful Tool
- Earlier known as PLT⁶ Scheme
- Top region for typing programs
- Bottom region for REPL

⁵<https://racket-lang.org/>

⁶Programming Languages Team

Racket IDE



Instructions

- Download from the site
- Change your language to R5S5.

Example (Screen)

Beginning Student with List Abbreviations
Intermediate Student
Intermediate Student with Lambda
Advanced Student

DeinProgramm

Die Macht der Abstraktion - Anfänger
Die Macht der Abstraktion
Die Macht der Abstraktion mit Zuweisungen
Die Macht der Abstraktion - fortgeschritten

- Other Languages (ctl-O)

Legacy Languages

R5RS

Pretty Big

► Swindle

First three chapters of the book:

- Building Abstractions from Procedures
- Building Abstractions from Data
- Modularity, Objects and State

Evaluation Pattern

Mostly the evaluation is continuous through out the semester and consists of:

- Quizzes
- Live Interactions
- Programming assignments with Viva

Other Reading Materials

- Little Schemer
- Reasoned Schemer
- Simply Scheme
- How to Design Programs

and many more online materials. . .

- Ms. Prathibha Mol
- Mr. Sumesh K J
- (occasionally) Dr.R.Sreekumar

In the next class

- Next, we will have a brief (no, complete) introduction scheme.
- We prefer to call Scheme as “our language”.
- Because authors prefers so.

Thank You!!!