Documentation for 'scilab2c' Scilab extension

Siddhesh Wani

0.1 Introduction

'Scilab' is a programming language widely used by researchers and students for scientific computations. Scilab is very easy to use and learn. But with easiness of use comes the problem of porting to different platforms (specially embedded devices) and execution speed where C coding takes the precedence. Wouldn't it be nice if there is an utility to convert scilab code to C code? Here comes the 'Scilab2c' to help. 'Scilab2c' is an extension for Scilab for converting scilab files to C code. This document gives an introduction about 'Scilab2C', how to use it and flowcharts for 'Scilab2C' extension. Contents are arranged as follows:

- Need for code conversion
- Introduction to 'Scilab2C'
- How to use 'Scilab2C'
- Flowcharts for 'Scilab2C'.

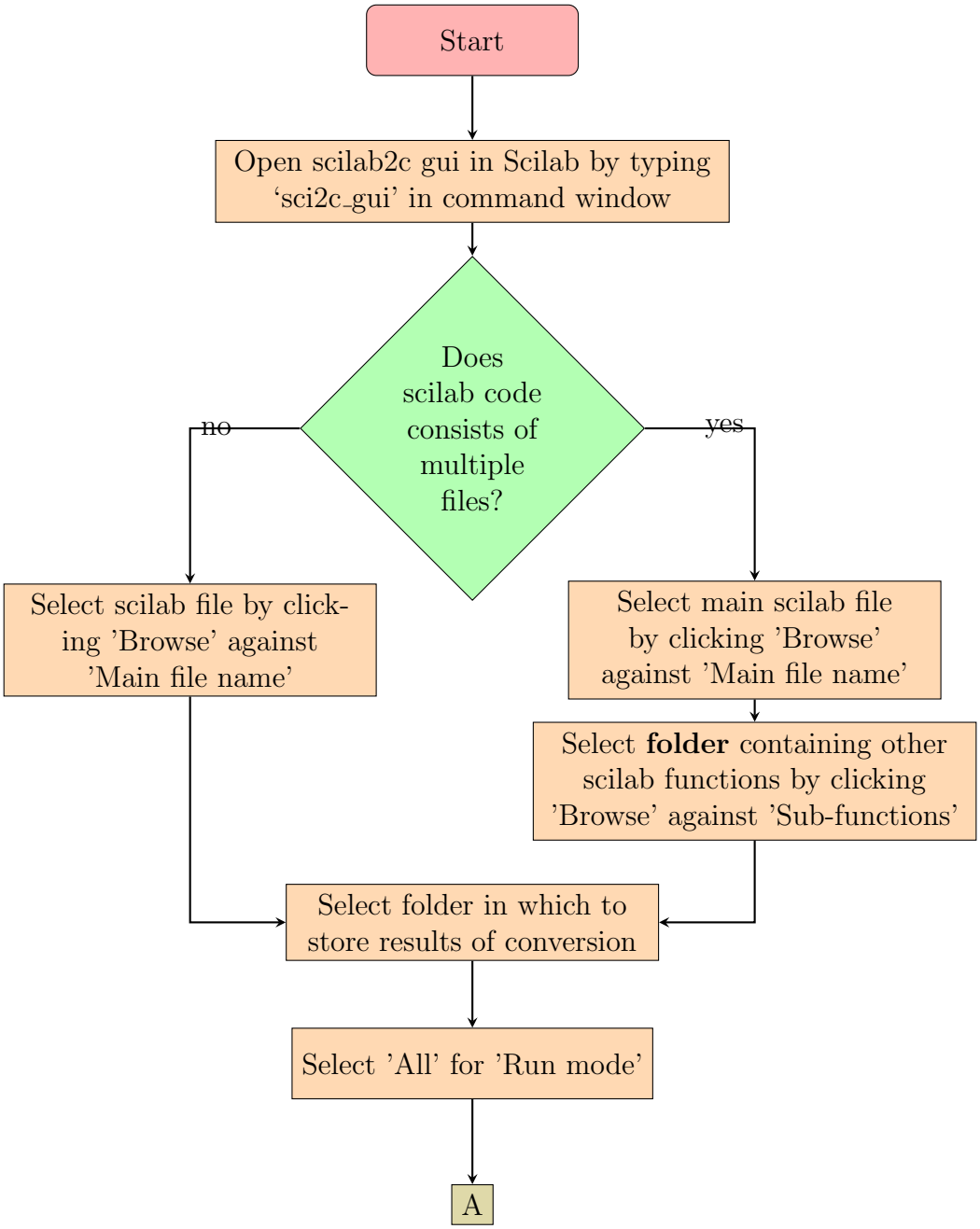
0.2 Need for code conversion

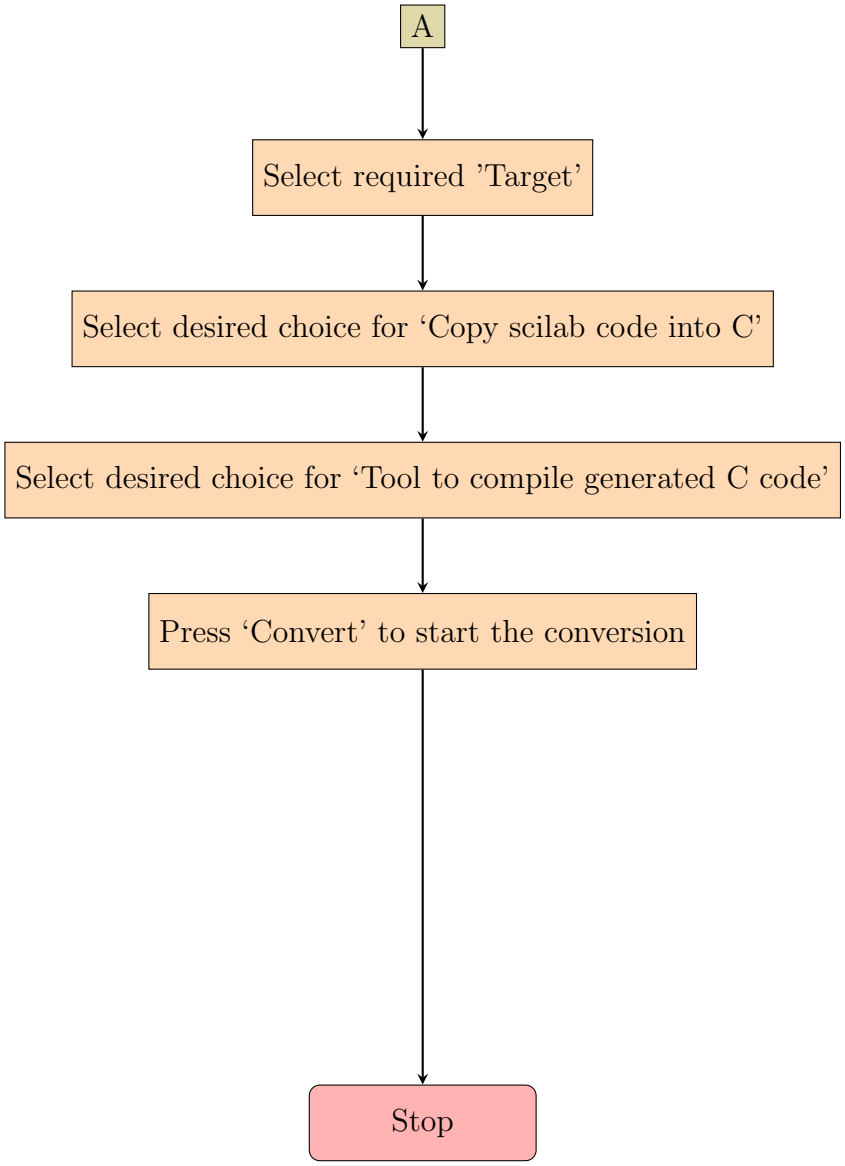
As stated in introduction, Scilab is a high level programming language easily understood by majority of the scientific community. Since syntaxing is very easy to learn, it is preferred over other programming languages like C, Java or Python. But code written in Scilab is not portable to embedded devices as compiler for compiling scilab code to machine languages is not available. On the other hand, code written in C is easily portable to embedded devices because of the avilability of such compilers. But learning C and writing code in C is not that easy as syntaxing rules are quite strigent. So, an extension like 'Scilab2C' is very useful for converting codes written in scilab to C code. Another advantage of C code is that it may consume less space in memory and execute faster than an equivalent scilab code. Hence, a covertor tool like 'Scilab2C' is very useful for the user.

0.3 Introduction to 'scilab2c'

0.4 How to use ‘scilab2c’

This flow chart describes steps to be followed for using ‘scilab2c’ extenstion.




A
Select required 'Target'
Select desired choice for 'Copy scilab code into C'
Select desired choice for 'Tool to compile generated C code'
Press 'Convert' to start the conversion
Stop

0.5 Flowcharts

scilab2c.sci

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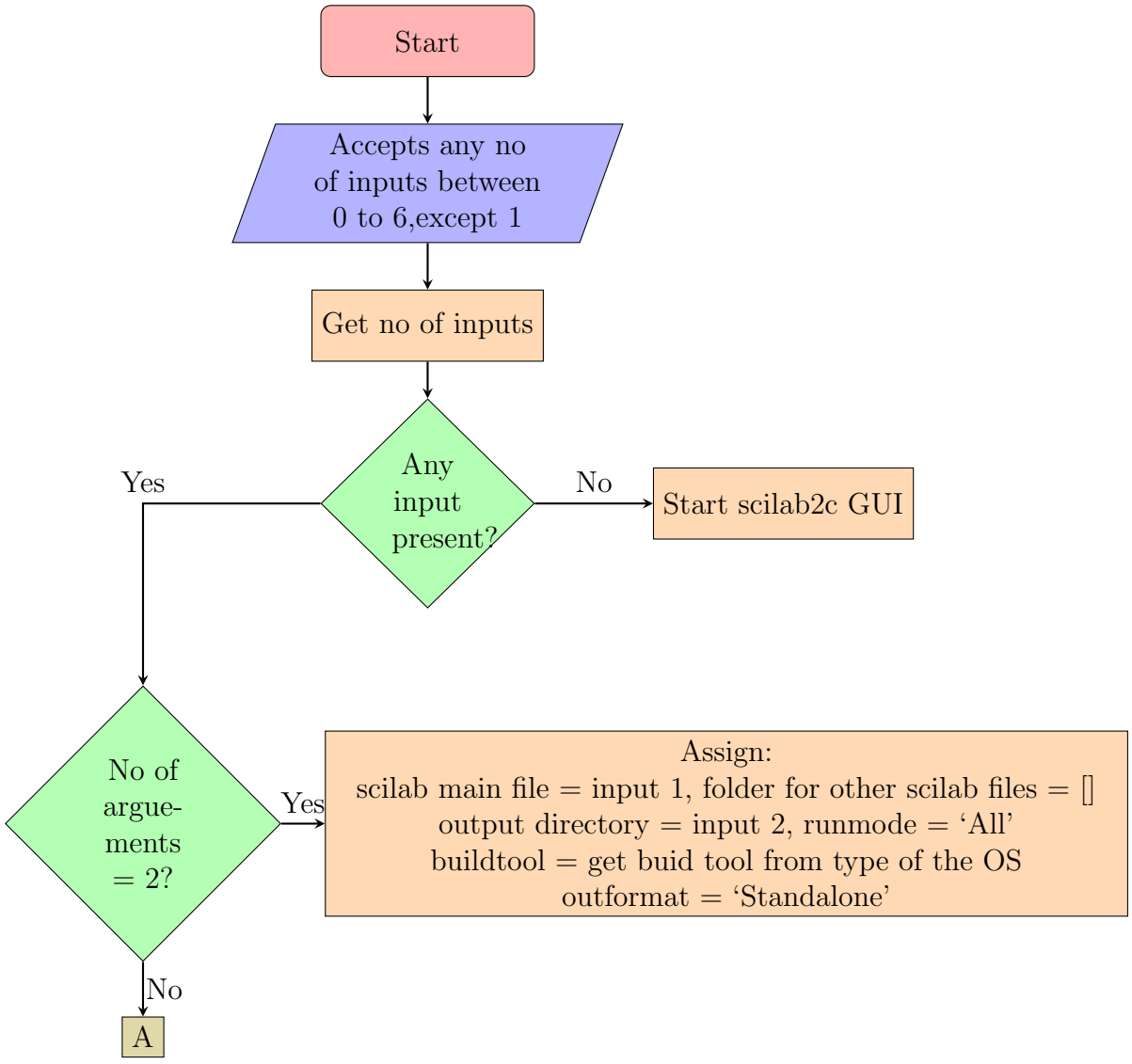
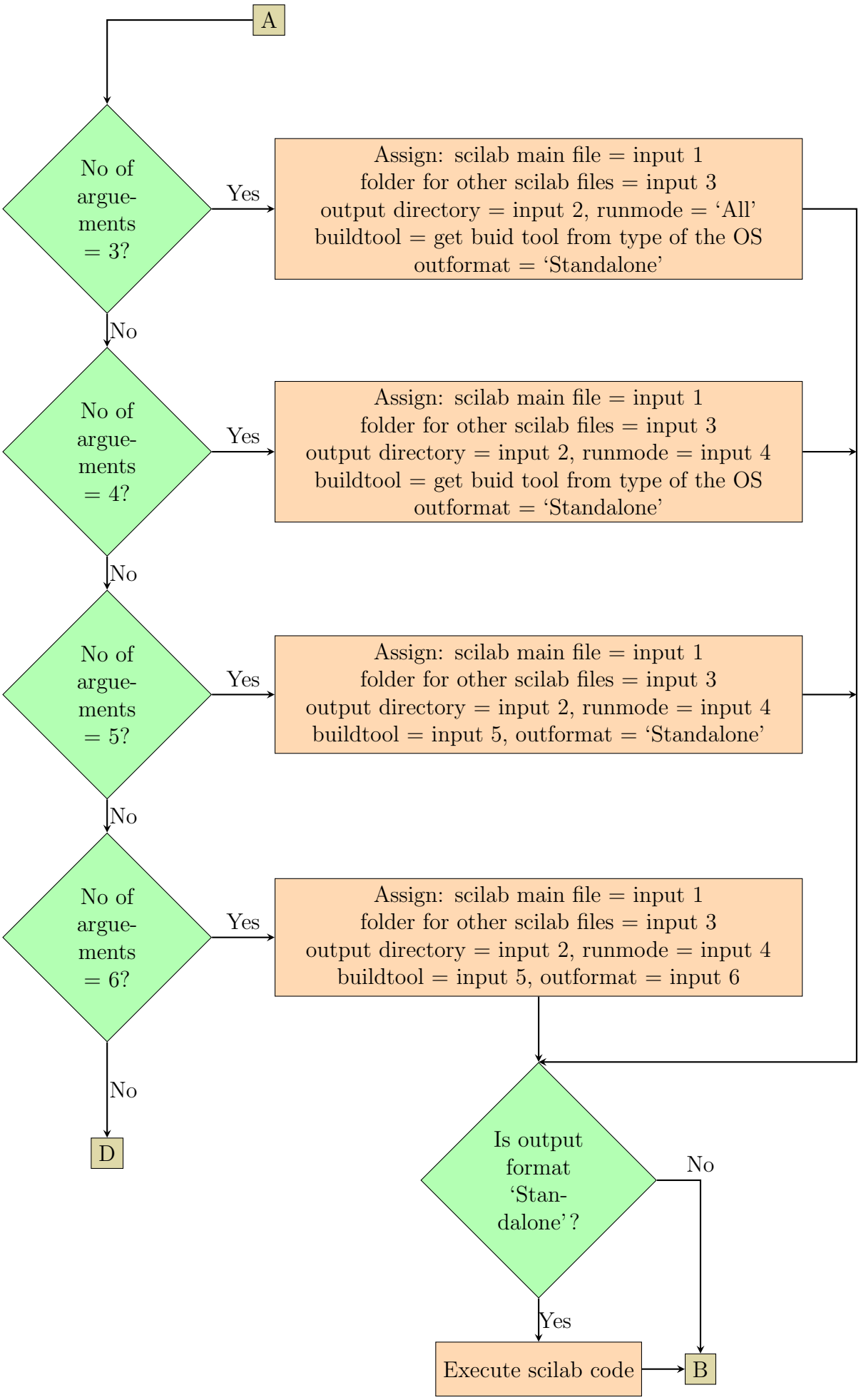
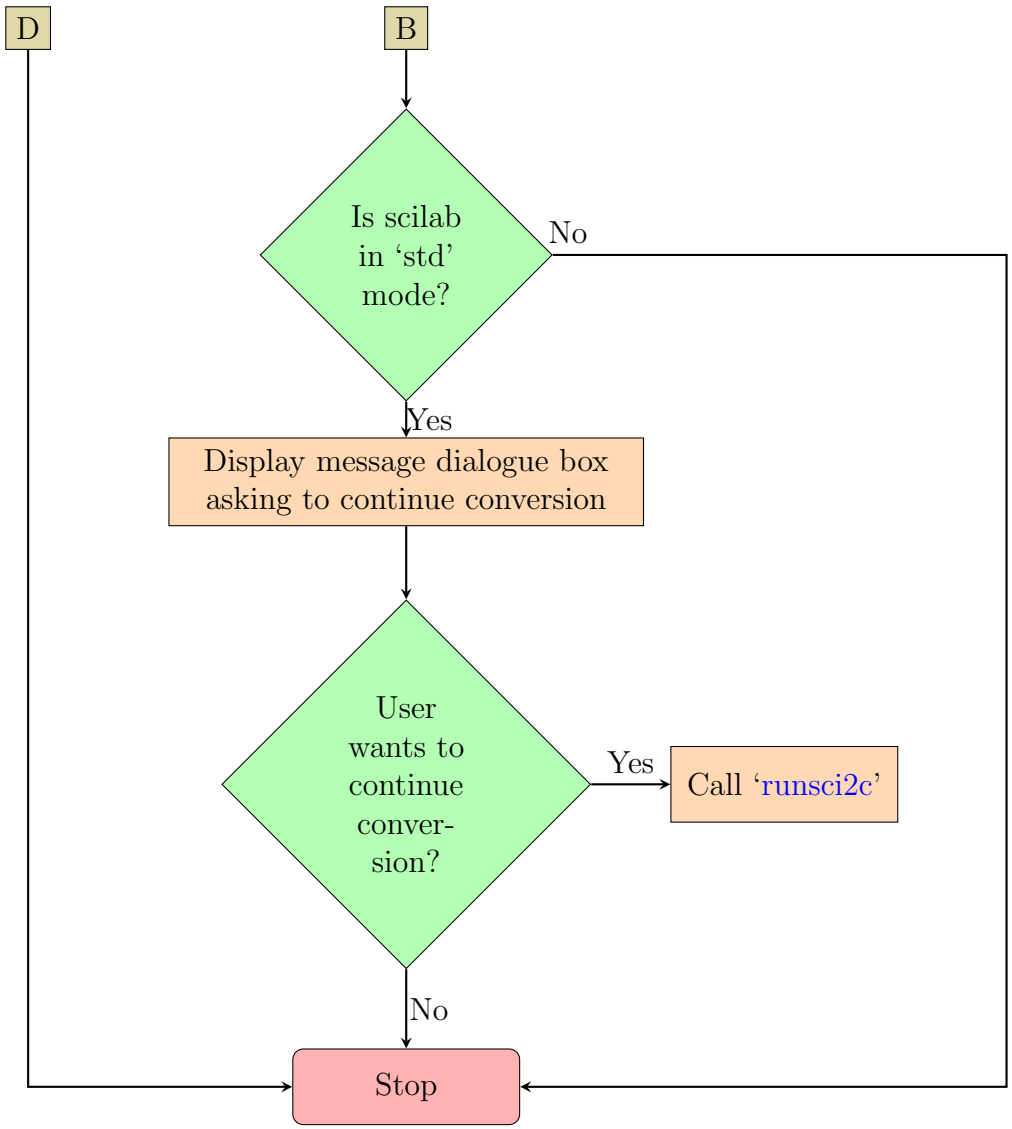
Introduction

'scilab2c' is the main function for scilab2c module. Code execution for scilab2c starts from this function. 'scilab2c' function can be used from command line. It accepts variable number of arguements and depending upon no of arguements and their values it calls 'runsci2c'.




A
No of argue-ments = 3?
Yes
Assign: scilab main file = input 1
folder for other scilab files = input 3
output directory = input 2, runmode = 'All'
buildtool = get buid tool from type of the OS
outformat = 'Standalone'
No
No of argue-ments = 4?
Yes
Assign: scilab main file = input 1
folder for other scilab files = input 3
output directory = input 2, runmode = input 4
buildtool = get buid tool from type of the OS
outformat = 'Standalone'
No
No of argue-ments = 5?
Yes
Assign: scilab main file = input 1
folder for other scilab files = input 3
output directory = input 2, runmode = input 4
buildtool = input 5, outformat = 'Standalone'
No
No of argue-ments = 6?
Yes
Assign: scilab main file = input 1
folder for other scilab files = input 3
output directory = input 2, runmode = input 4
buildtool = input 5, outformat = input 6
No
D
Is output format 'Stan-dalone'?
No
Yes
Execute scilab code
B


D
B
Is scilab in 'std' mode?
No
Yes
Display message dialogue box asking to continue conversion
User wants to continue conver- sion?
Yes
Call 'runsci2c'
No
Stop

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runsci2c.sci

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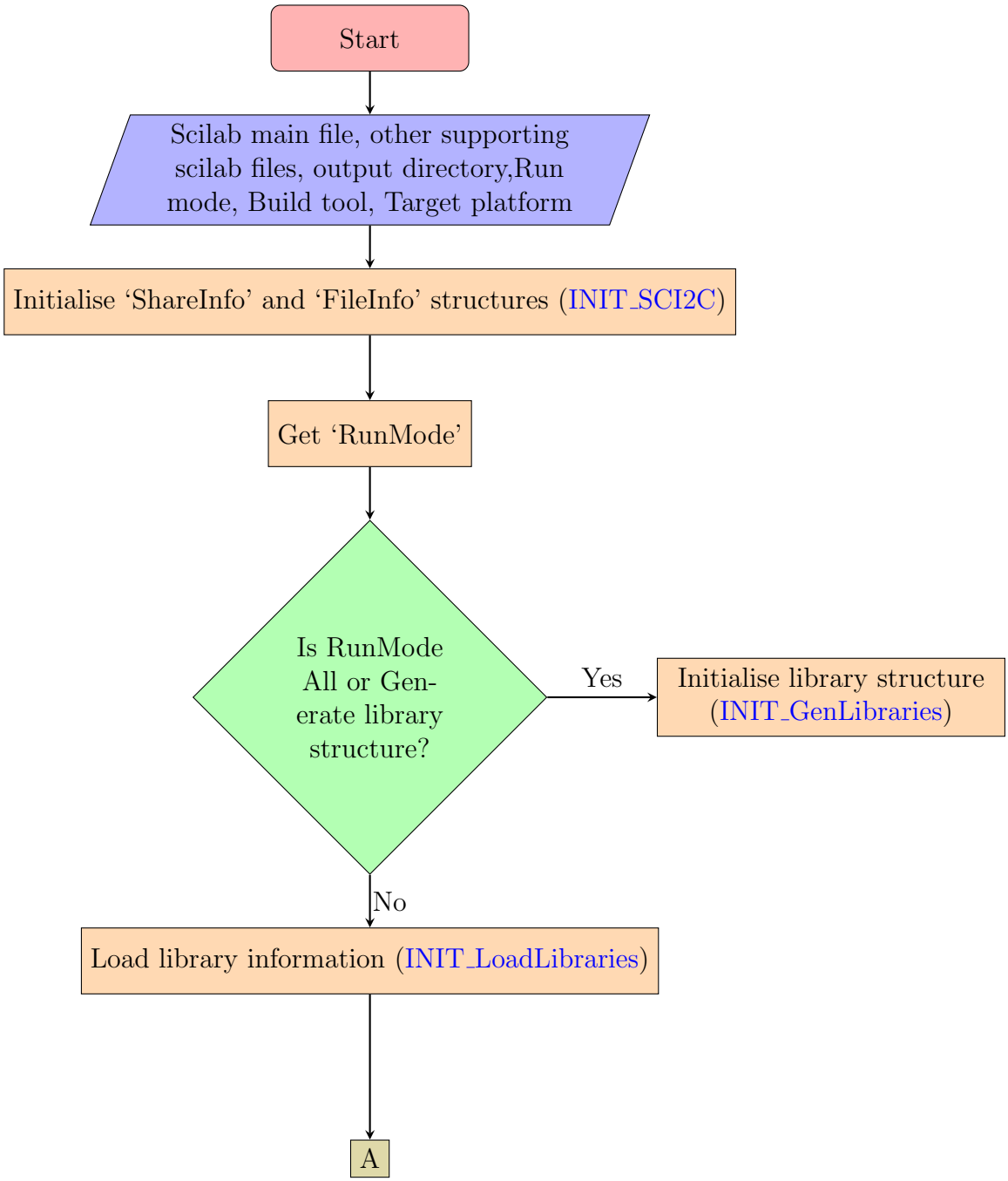
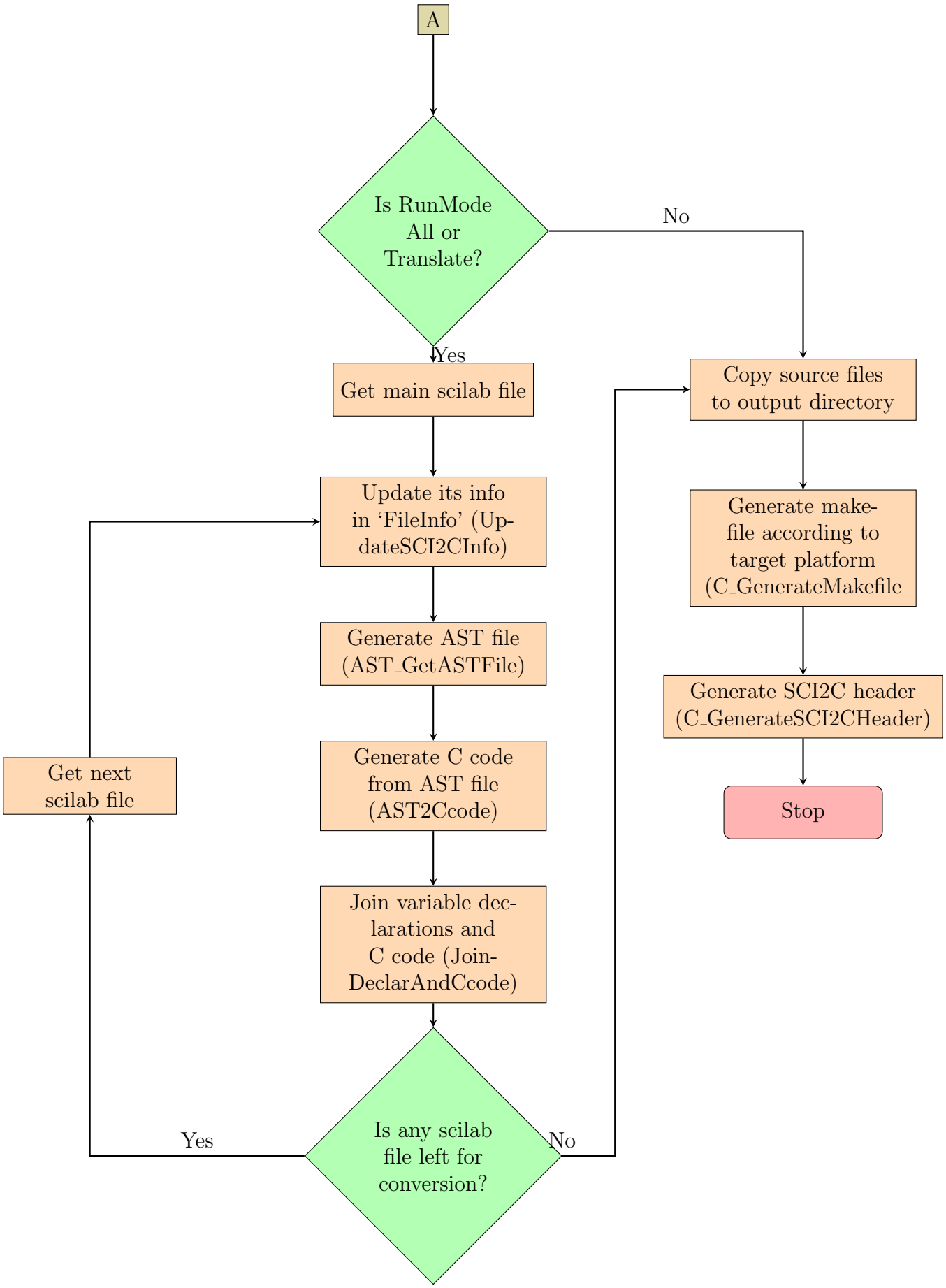
Introduction

'runsci2c' is called by 'scilab2c'. It calls some initialisation modules and then does the conversion. After conversion is complete, it copies the source files in output directory and then calls other module to generate makefile for compilation.




A
Is RunMode All or Translate?
No
Yes
Get main scilab file
Update its info in 'FileInfo' (UpdateSCI2CInfo)
Generate AST file (AST_GetASTFile)
Generate C code from AST file (AST2Ccode)
Join variable declarations and C code (JoinDeclarAndCcode)
Is any scilab file left for conversion?
Yes
Get next scilab file
No
Copy source files to output directory
Generate makefile according to target platform (C_GenerateMakefile
Generate SCI2C header (C_GenerateSCI2CHeader)
Stop

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INIT_SCI2C.sci

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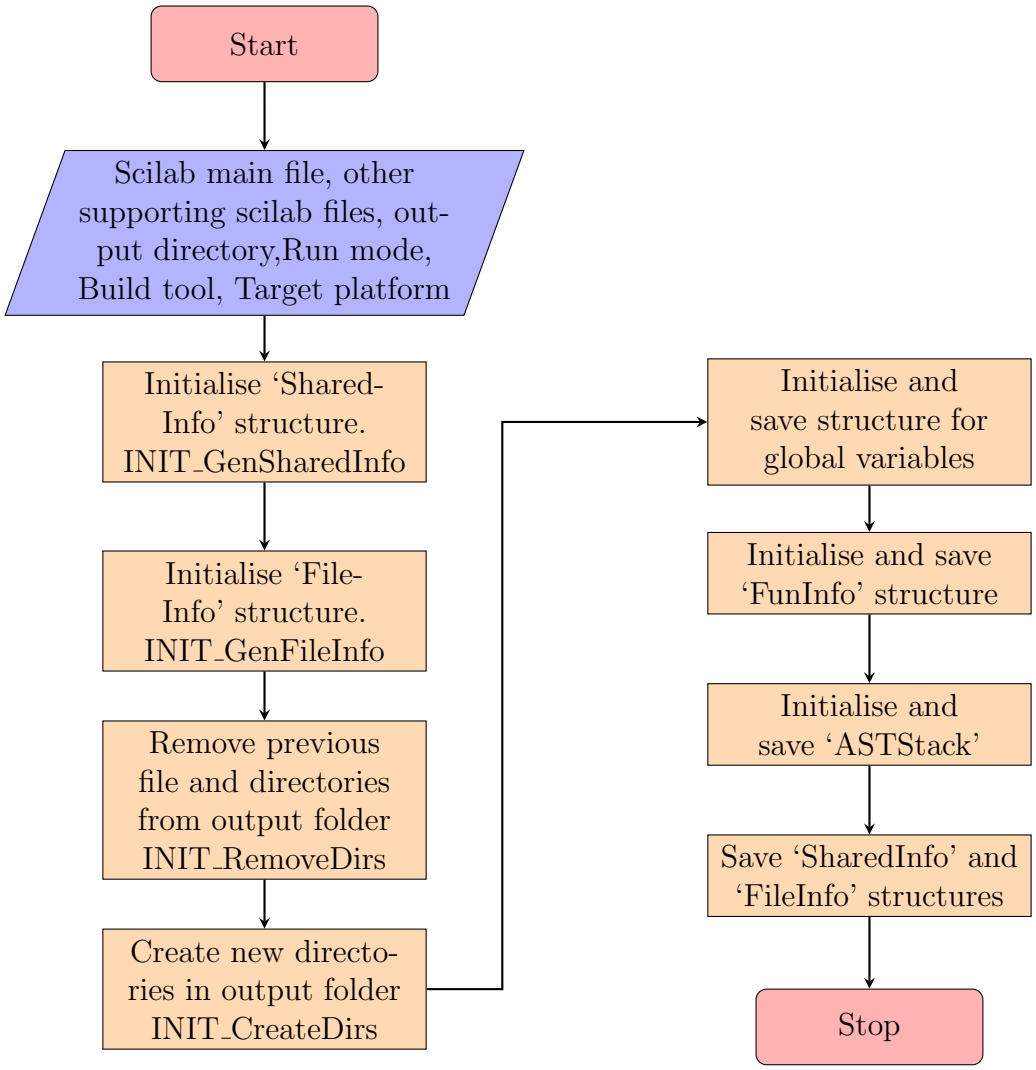
Introduction

'INIT_SCI2C' initialises sscilab2c extension using the given input parameters. 'FileInfo' and 'SharedInfo' structures are initialised and stored in .dat files. Directory structure is created. Other few .dat files required by extension are initialised and saved on disk.



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INIT_GenLibraries.sci

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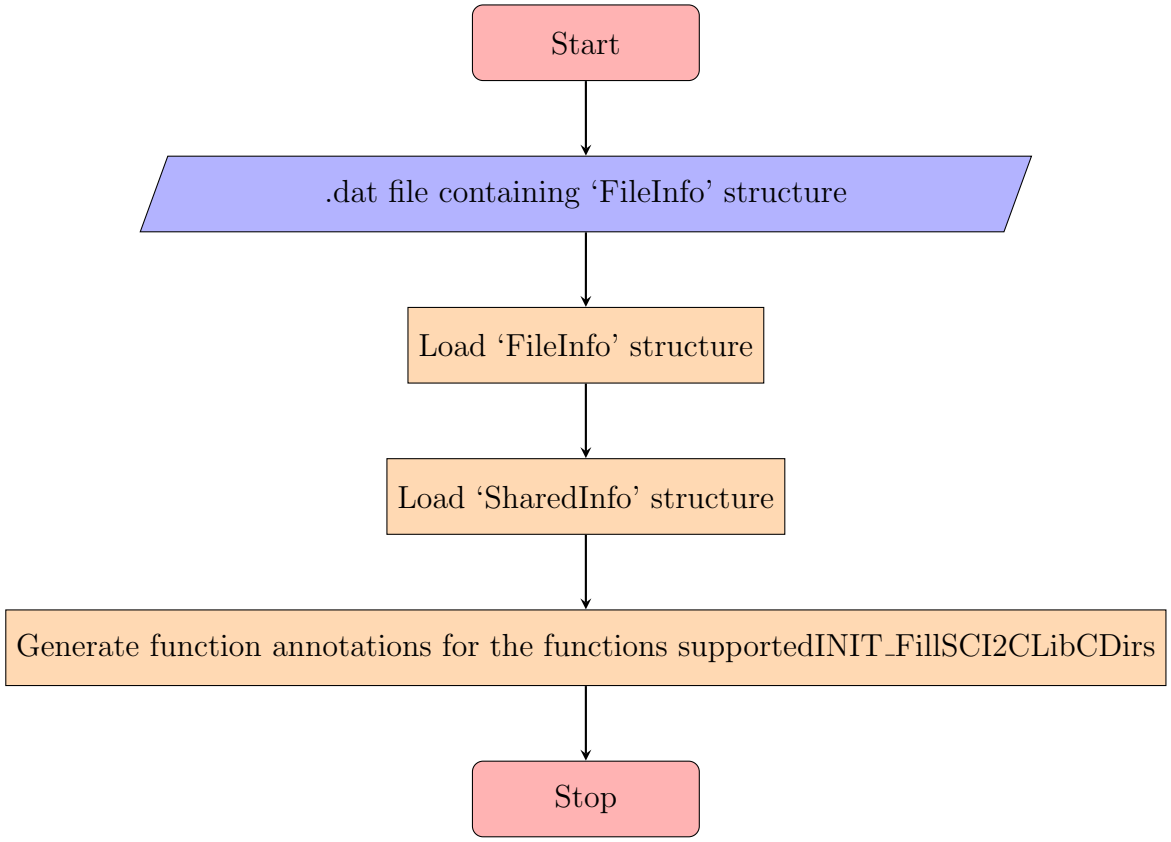
Introduction

'INIT_GenLibraries' call 'INIT_FillSCI2CLibCDirs' which generates function annotations for the functions supported by scilab2c extension.



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