Code Generation

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1) Which are the tools used for code generation in MATLAB ?
   - RTW - Real Time Workshop
   - Targetlink

2) When you create a variable in a Matlab, what its default datatype ?
   - Default datatype of variable is double

2) Code generation process
   - After completion of your model then put your model in atomic subsystem
   - Go-to configuration parameter and in code generation select system target file as embedded coder i.e. ert.tlc embedded real time target language compiler
   - Check the generate code only option
   - If you want to save generated code then check the option package code and artifacts and provide a name for zip file
   - Build your model
   - Completion of build process gives a result which having a .c, .h, i.e. c file code its header file of the model

3) What are the datatypes of variable after code generation ?

Simulink datatype	Datatype after code generation
double	Real_t
single	Real32_t
Int8	Int8_t
Uint8	Uint8_t
Boolean	Boolean_t

4) How to navigate from model to code and from code to model ?
   - From model to code ---->
     - Right click on that block ---> c/c++ code ---> navigate to c/c++ code
   - From code to model ---->
     - From the c code click on that respective code where it contain a block name will direct to block which is having code syntax

5) What is traceability report ?
   - Traceability report gives a list of eliminated virtual block for which the code is not generated
   - It also gives the list of traceable simulink blocks/stateflow objects/matlab functions which is helpful to direct to the code for that specific block.

6) What happen if we use variable solver for code generation ?
   - We will not be able to generate code with ert.tlc with variable solver.

7) Why we are interested in automatic code generation ?

- When we used automatic code generation the standard code will get generated
- When we write a code by hand then code will get varies person to person this problem get eliminated when we generate automatic standard code.

8) What happens if we use variable solver ?
   - Generally we are using fixed step solver for generation of code because ones the code generated we will deploy it into target microcontroller so to deploy this we have to match the real time clock frequency of microcontroller that's why we prefer fixed step solver as variable step solver does not matches the real time clock frequency due to increased steps because of zero crossing events.

9) What are bugs in code generation ?
   - Code is not generated for the root level subsystem i.e. for virtual block i.e. non atomic blocks
   - System target file must be selected as ert.tlc
   - Setting of configuration parameter for both model i.e. main model and its harness model must be same
   - We can not use virtual blocks in model for generating the code i.e. signal builder.

10) What is strong data type ?
    - When you define data type that is strong data type

11) What is difference between ert.tlc and grt.tlc ?
    - grt uses a larger memory model and is a target for generic use (as the name says) mostly on the host PC. ert (embedded real-time target) is using a smaller memory model, and optimizes better for speed and memory. To generate code using ert you might just choose the ert.tlc on the Simulink Parameters page
    - ert ---> Embedded real-time target
    - grt ---> Generic real-time target
    - tlc ---> Target Language Compiler