Python

Agenda – Final Projects

- **DIO Configuration Tool**
- **Map File Parser**

DIO CONFIGURATION TOOL

DIO Configuration Tool

Main Idea

Each embedded system project has its own configuration for its drivers.

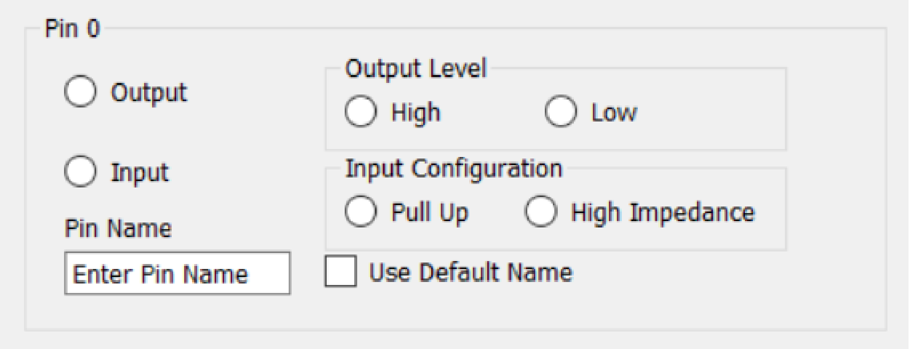
For ex. **DIO**, **TIMERS** and **Communication drivers.**

In this project, The target is to make a GUI configuration tool for DIO to generate its configuration files instead of manually editing the existing files.

DIO Configuration Tool

Requirements:

- The tool shall be able to configure all the micro-controller pins.
- Each pin shall have the following configurations “as the simple tool we did last session”



- The tool shall have 3 buttons for configuration:
  - New -> create a file with any extension to save the current configurations.
  - Save -> to save the changes you made to the file.
  - Load -> to load a previous configurations.

MAP FILE PARSER

Map File Parser

Main Idea

One of the output files of compiler X is a map file. Which contains some data about the memory organization in the project.

For ex.:

- Each section Location.
- Each section size.
- The detailed consumption for each C file.

One of the project activity is to know the memory consumption “ROM and RAM” for each component “Driver”.

Map File Parser

Main Idea

Each manually coded components has set of Code files:

- XXX_prg.c
- XXX_cfg.c

But All AUTOSAR components have many files per component.

For ex. The CanIf module consists of:

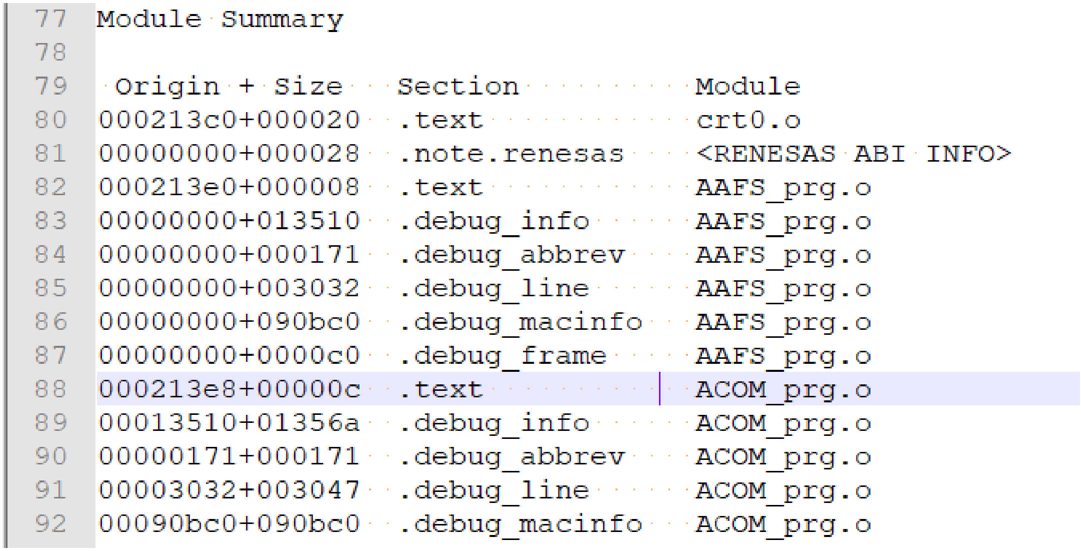
- CanIf.c
- CanIf_Cbk.c
- CanIf_Cfg.c
- CanIf_LCfg.c
- CanIf_ModeHandler.c

When we need to know the component memory consumption we mean all the consumption of its files.

Map File Parser

Main Idea

The data is organized in the file as the following:



```
77  Module Summary
78
79   Origin + Size    Section          Module
80  000213c0+000020   .text            crt0.o
81  00000000+000028   .note.renesas    <RENESAS ABI INFO>
82  000213e0+000008   .text            AAFS_prg.o
83  00000000+013510   .debug_info      AAFS_prg.o
84  00000000+000171   .debug_abbrev    AAFS_prg.o
85  00000000+003032   .debug_line      AAFS_prg.o
86  00000000+090bc0   .debug_macinfo   AAFS_prg.o
87  00000000+0000c0   .debug_frame     AAFS_prg.o
88  000213e8+00000c   .text            ACOM_prg.o
89  00013510+01356a   .debug_info      ACOM_prg.o
90  00000171+000171   .debug_abbrev    ACOM_prg.o
91  00003032+003047   .debug_line      ACOM_prg.o
92  00090bc0+090bc0   .debug_macinfo   ACOM_prg.o
```

For Example: ACOM_prg.c file at line 88

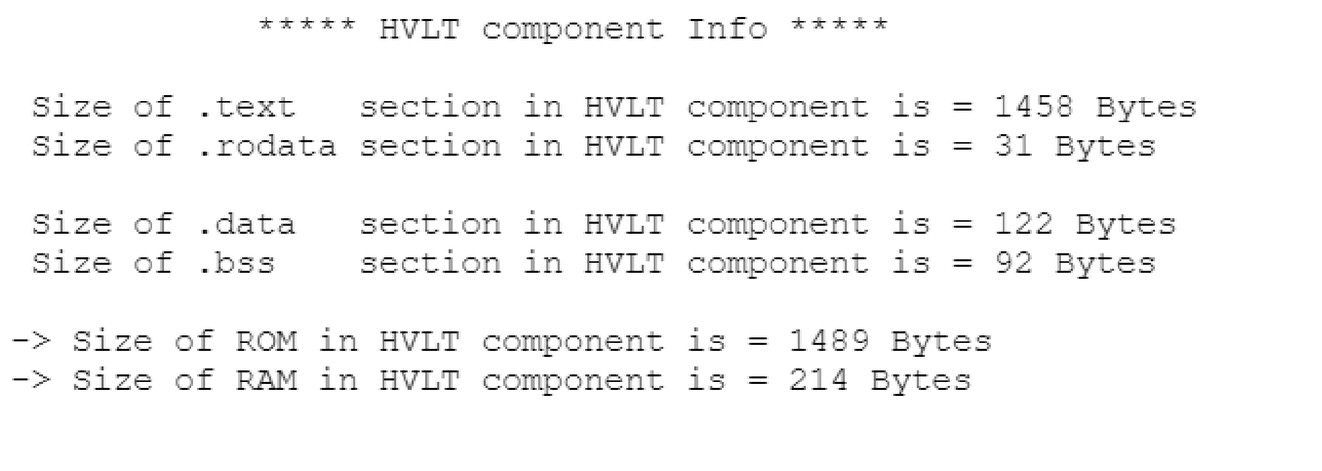
The section ".text" starts at address 0x213e8 "Origin" and its size is 0xC bytes.

All the debug section will be ignored as in the production phase, no debug info will be used.

Map File Parser

Requirements

- Create a script which parse the map file.
- The script will run using CMD.
- The script will take arguments “ one or more”
- Each argument will be the component name.
- The component name is Case Sensitive.
- The tool shall generate a text file per component.
- The needed section and the format of the generated file shall be as following: “for example: HVLT component”



```
                ***** HVLT component Info *****

     Size of .text   section in HVLT component is = 1458 Bytes
     Size of .rodata section in HVLT component is = 31 Bytes

     Size of .data   section in HVLT component is = 122 Bytes
     Size of .bss    section in HVLT component is = 92 Bytes

    -> Size of ROM in HVLT component is = 1489 Bytes
    -> Size of RAM in HVLT component is = 214 Bytes
```

Final Projects

- For Map file Parser project: Please download the map file and the output examples to test your script from the following link:
  - https://drive.google.com/open?id=1RTosCMfuZf0PtFbEGo0RR1horlJeioyZ
  - Complete the project in **2 weeks** and send your solution on the following email:
  - Omar.Soliman@imtSchool.com with the following subject :
    - If you are from ITI-Smart track ES:
      - [ITI_SV_39][Project_Name]yourfullname
    - If you are from ITI-Nasr City track ES:
      - [ITI_NC_39][Project_Name]yourfullname

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