Contents

Introduction

Environment:

This program is written using Python3. Python3 environment and file directory setup is needed in order to for this program to work properly. Please refer to Environment Setup for details.

Data file:

3 or 4 data files (*RND_LTE file*, *remedy file*, *BTU_LTE file* and/or *RND_UMTS file*) are required to get complete information of the RF site. *RND_UMTS file* is Optional, provide if user wants UMTS data in the *RCS.* Please refer to Providing Data Files for details.

User Input:

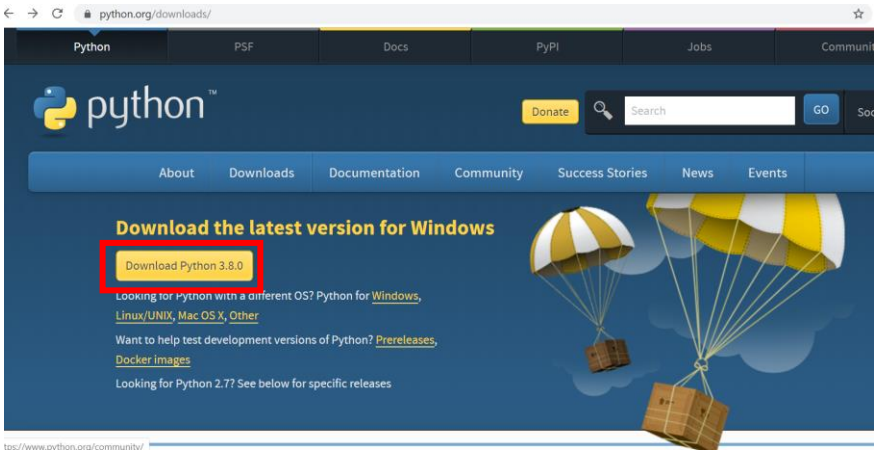
Upon execution of the program, user will be prompted to feed in three input (*EMG, Designer Name, Site Address*). *EMG* is Required for the program to identify the correct site to parse. The other two inputs, however, are optional. User can choose to later edit these two information in the generated *RCS Spreadsheet*. Please refer to Executing Program and Inputting for details.

Know more about the code:

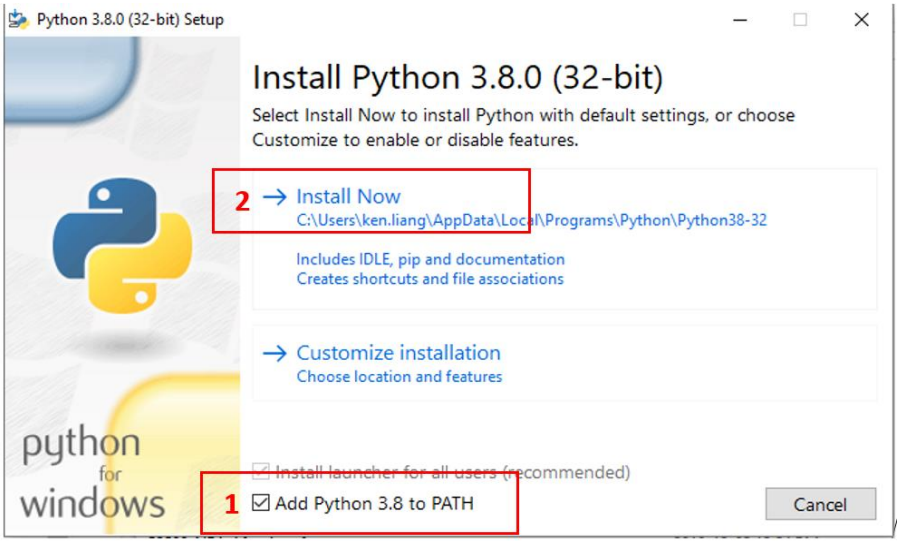
Refer to Appendix for more technical description about the code

Python3 Environment Setup

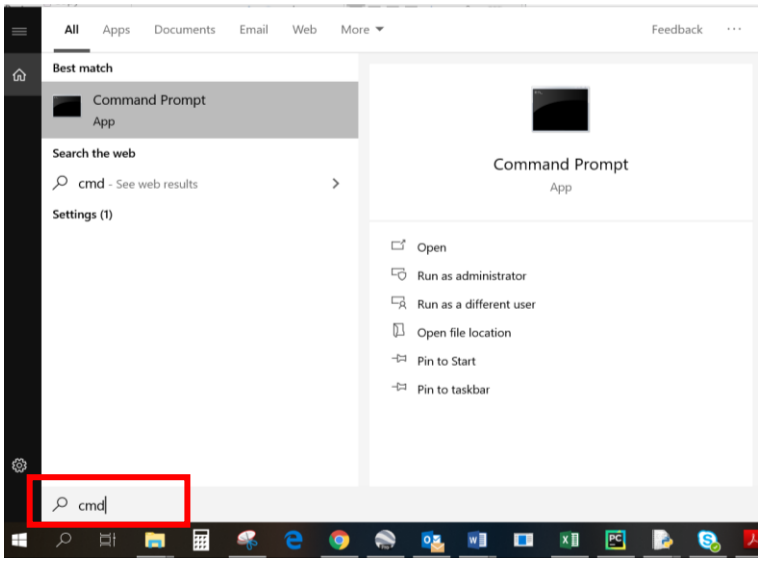
- Go to https://www.python.org/downloads/, download the latest version Python3



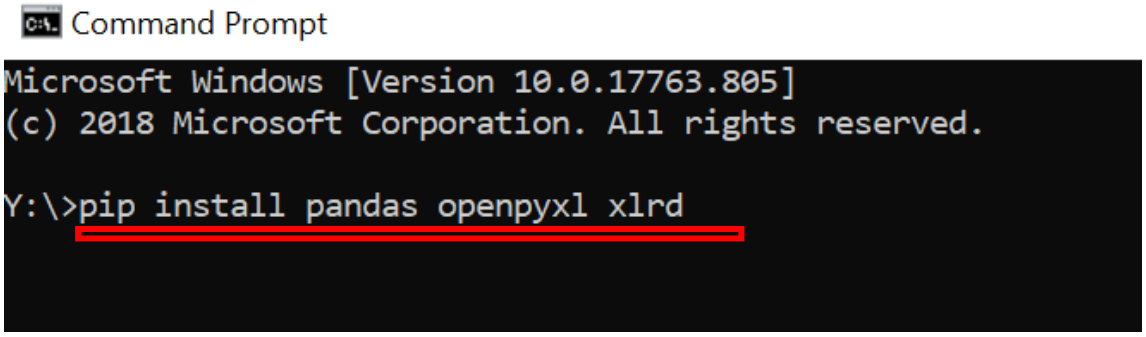
- In the installation wizard, select *Add Python to Path* (this allows Python to be recognized in the *command prompt* that we will later use for installing Python Package program), then select *install now.*



- Open *Command Prompt* by typing *cmd* in *Search*



- Copy paste the following Command and hit Enter to install packages
    1) *pip install pandas openpyxl xlrd*

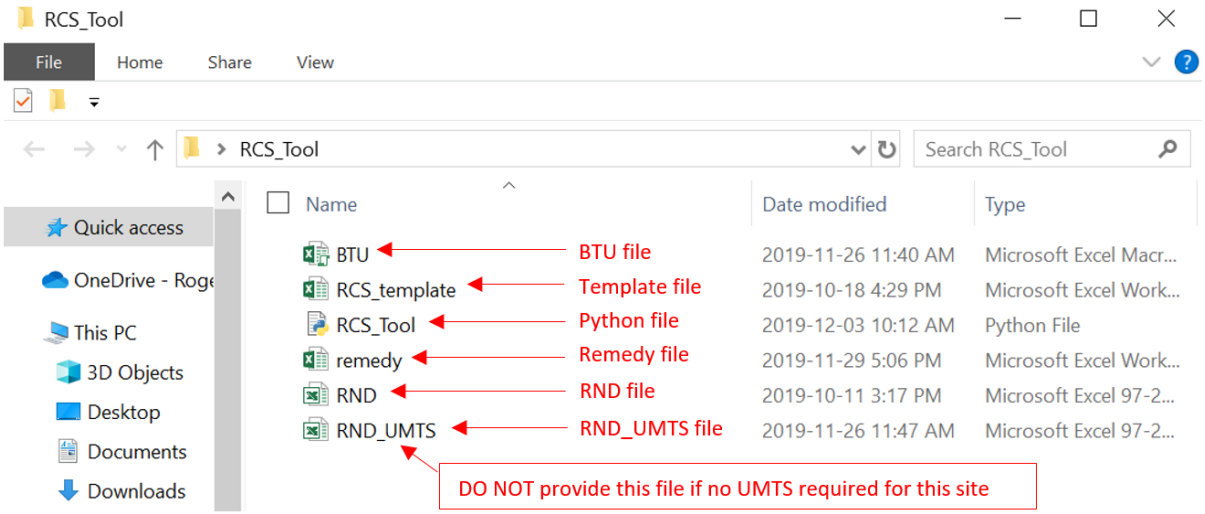


Providing Data Files

- This program will accept 3 data files and 1 template file to generate RCS LTE Spreadsheet (remedy file, BTU, RND)

- Optional file: If RCS UMTS Spreadsheet is also required inside RCS, provide 1 extra file (RND_UMTS file) to incorporate UMTS. (DO NOT provide UMTS file if UMTS is not required for this site, Or else the UMTS Spreadsheet will still be generated in the RCS)

- How to feed data files to the program:
  1) Rename the corresponding files with the names below:
     1. Template file named as: *RCS_template*
     2. Remedy file named as: *remedy*
     3. BTU LTE file named as: *BTU*
     4. RND LTE file named as: *RND*
     5. RND_UMTS file named as: *RND_UMTS*
  2) Put them into the same folder as the Python Program

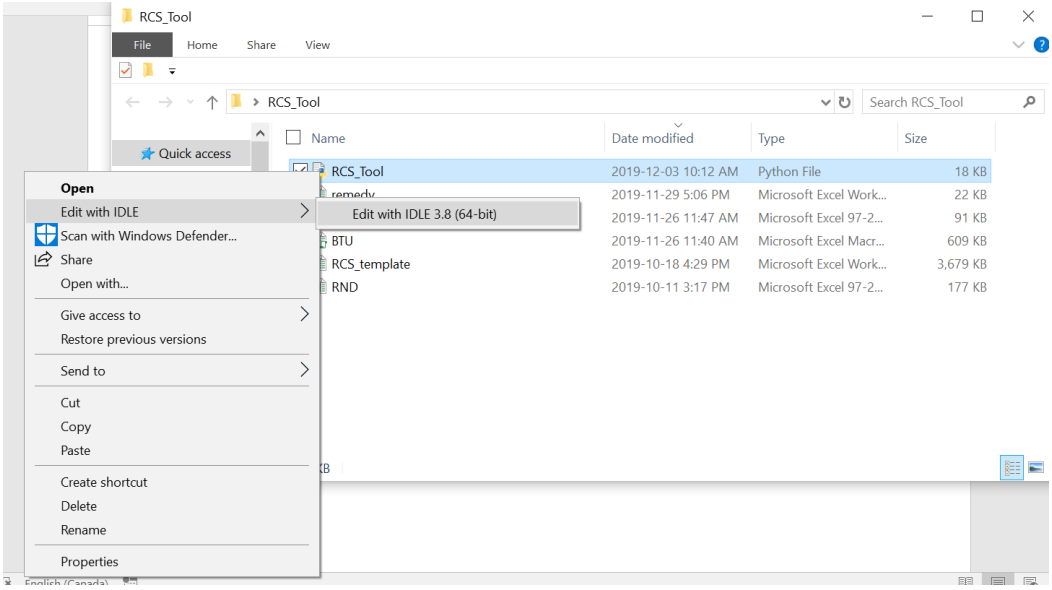


Executing Program and Inputting

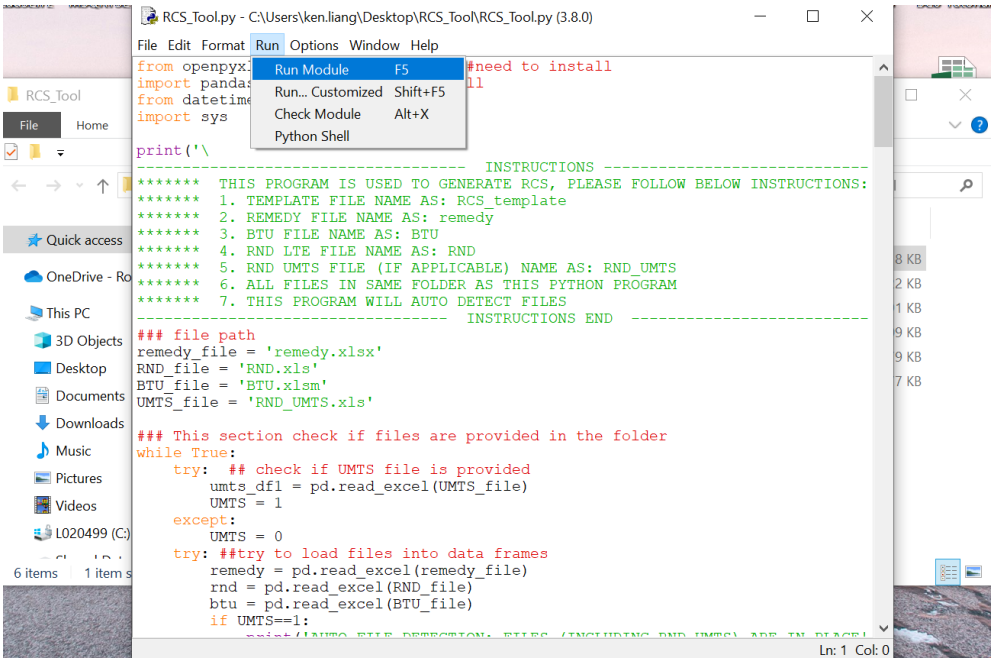
- Although user could *double click* the python file to execute the program, it is recommended to run the program using the built-in IDLE interface because this will display any errors that may occur during execution

- To run program using *IDLE*:

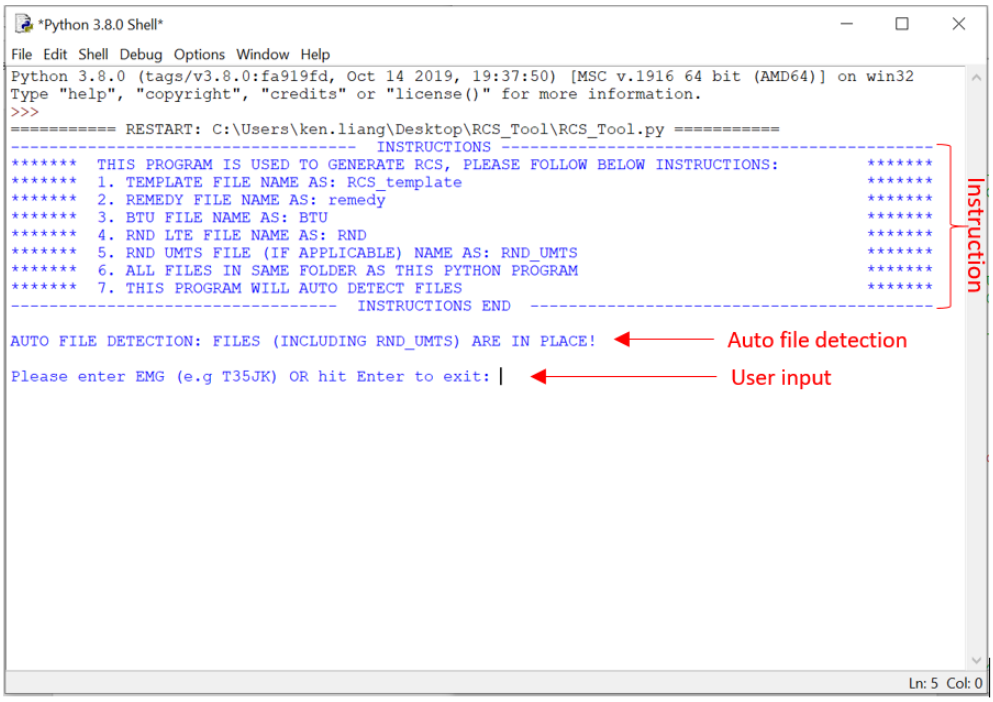
    1) *Right click* the python program -> *edit with IDLE*



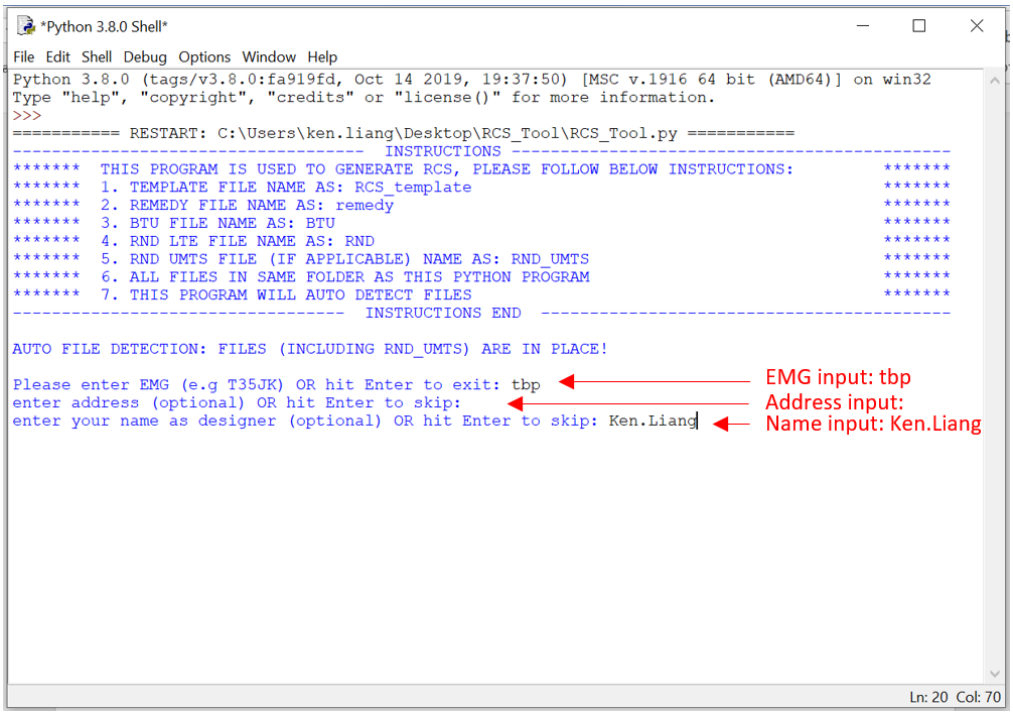
2) The following *IDLE editor interface* will show up, then click *run module* to run the program



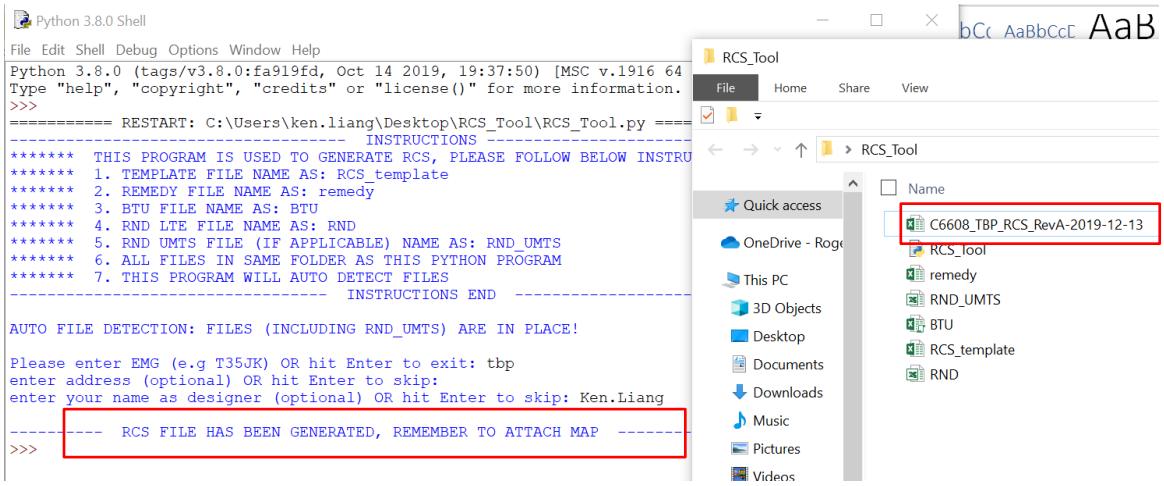
3) After *run module*, *python shell* will show up. At the beginning, the program will ask for *user input*



4) The program will ask for 3 input: EMG, Address, Name (latter two inputs are optional, can edit latter in RCS file)



5) Once entered input, the RCS file will be generated and located in the same folder as the python program



Appendix 1 – Code Description

- This program extract data base on *column labels*, so it is important that the *column labels* in the excel files match with what is specified in the code, the following section is focused on column label matching, and the related lines of code, which user can modify if changes occur on excel *column labels*

1. Remedy file *column labels* check:

   i. Remedy worksheet should have the below columns: *EMG*, *PSAP* and *Municipality_Code*

	A	B	C	D	AR	AS
	ERP_ID	Sector_ID	Status	EMG	PSAP	Municipality_Name
	ERP.1907.000894	SECT.0000228510	ACTIVE	TBP	DURHAMREG_POL	UXBRIDGE TWP
	ERP.1907.000894	SECT.0000228511	DESIGN	TBP	DURHAMREG_POL	UXBRIDGE TWP
	ERP.1907.000894	SECT.0000228512	DESIGN	TBP	DURHAMREG_POL	UXBRIDGE TWP
	ERP.1907.000894	SECT.0000228513	ACTIVE	TBP	DURHAMREG_POL	UXBRIDGE TWP
	ERP.1907.000894	SECT.0000228514	DESIGN	TBP	DURHAMREG_POL	UXBRIDGE TWP
	ERP.1907.000894	SECT.0000228515	DESIGN	TBP	DURHAMREG_POL	UXBRIDGE TWP
	ERP.1907.000894	SECT.0000228516	DESIGN	TBP	DURHAMREG_POL	UXBRIDGE TWP
	ERP.1907.000894	SECT.0000228517	ACTIVE	TBP	DURHAMREG_POL	UXBRIDGE TWP
	ERP.1907.000894	SECT.0000228518	ACTIVE	TBP	DURHAMREG_POL	UXBRIDGE TWP
	ERP.1907.000894	SECT.0000228519	ACTIVE	TBP	DURHAMREG_POL	UXBRIDGE TWP
	ERP.1907.000894	SECT.0000228520	ACTIVE	TBP	DURHAMREG_POL	UXBRIDGE TWP
	ERP.1907.000894	SECT.0000228521	ACTIVE	TBP	DURHAMREG_POL	UXBRIDGE TWP
	ERP.1907.000894	SECT.0000228522	ACTIVE	TBP	DURHAMREG_POL	UXBRIDGE TWP
	ERP.1907.000894	SECT.0000228523	ACTIVE	TBP	DURHAMREG_POL	UXBRIDGE TWP
	ERP.1907.000894	SECT.0000228524	ACTIVE	TBP	DURHAMREG_POL	UXBRIDGE TWP
	ERP.1907.000894	SECT.0000228525	DESIGN	TBP	DURHAMREG_POL	UXBRIDGE TWP
	ERP.1907.000894	SECT.0000228526	DESIGN	TBP	DURHAMREG_POL	UXBRIDGE TWP

Ontario_Remedy_Update_Template

   ii. Corresponding code (line 53 - 57), corresponding *column labels* circled in red, user can modify these to match the *column labels* with the excel file

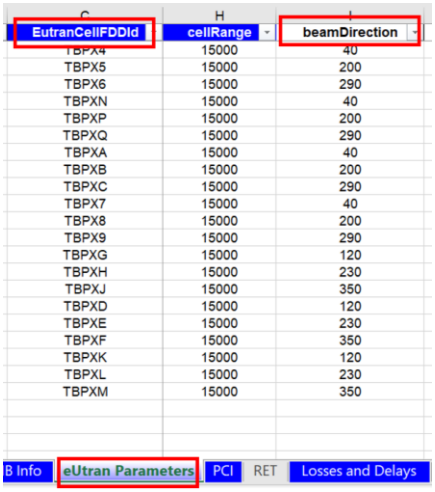
```
55    remedy_col_label1 = 'EMG'
56    remedy_col_label2 = 'Municipality_Name'
57    remedy_col_label3 = 'PSAP'
```

2. RND file check:

i. Make sure the file has these two worksheets ***eUtran Parameters*** & ***PCI***

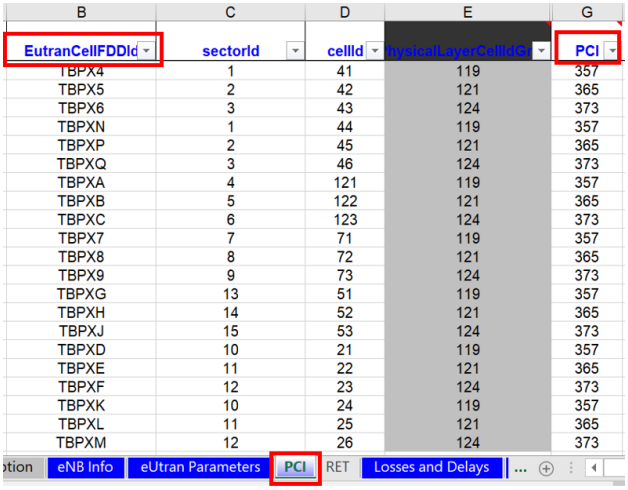
ii. In ***eUtran Parameters*** , there should be column labels: *EutranCellFDDId* & *beamDirection*

iii. In ***PCI***, there should be column labels: *EutranCellFDDId* & *PCI*



C	H	I
EutranCellFDDId	cellRange	beamDirection
TBPX4	15000	40
TBPX5	15000	200
TBPX6	15000	290
TBPXN	15000	40
TBPXP	15000	200
TBPXQ	15000	290
TBPXA	15000	40
TBPXB	15000	200
TBPXC	15000	290
TBPX7	15000	40
TBPX8	15000	200
TBPX9	15000	290
TBPXG	15000	120
TBPXH	15000	230
TBPXJ	15000	350
TBPXD	15000	120
TBPXE	15000	230
TBPXF	15000	350
TBPXK	15000	120
TBPXL	15000	230
TBPXM	15000	350

B Info | eUtran Parameters | PCI | RET | Losses and Delays



B	C	D	E	G
EutranCellFDDId	sectorId	cellId	physicalLayerCellIdGr	PCI
TBPX4	1	41	119	357
TBPX5	2	42	121	365
TBPX6	3	43	124	373
TBPXN	1	44	119	357
TBPXP	2	45	121	365
TBPXQ	3	46	124	373
TBPXA	4	121	119	357
TBPXB	5	122	121	365
TBPXC	6	123	124	373
TBPX7	7	71	119	357
TBPX8	8	72	121	365
TBPX9	9	73	124	373
TBPXG	13	51	119	357
TBPXH	14	52	121	365
TBPXJ	15	53	124	373
TBPXD	10	21	119	357
TBPXE	11	22	121	365
TBPXF	12	23	124	373
TBPXK	10	24	119	357
TBPXL	11	25	121	365
TBPXM	12	26	124	373

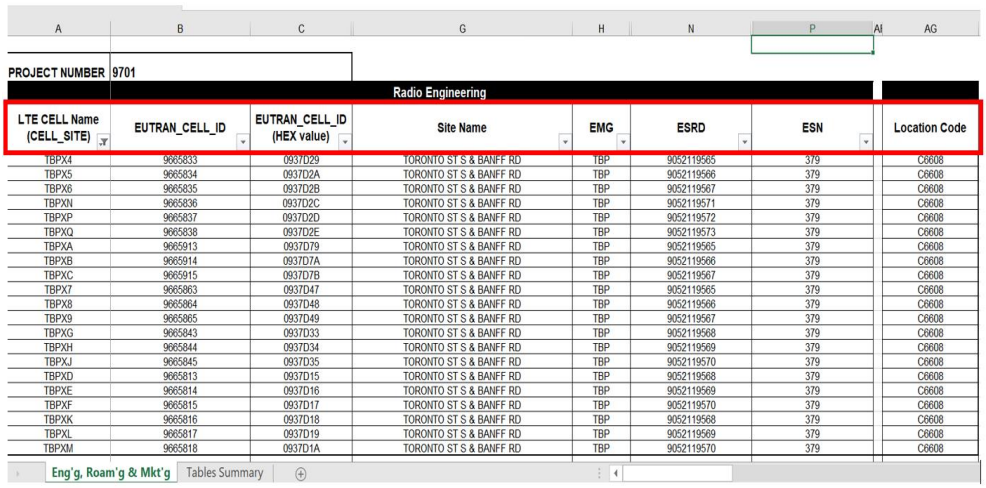
ption | eNB Info | eUtran Parameters | PCI | RET | Losses and Delays | ...

iv. Corresponding code (line 83 - 88) for selecting worksheets ***eUtran Parameters*** & ***PCI*** (circled in orange), *column labels* (circled in red)

```
81  while True:### check if RND file containing input EMG
82      try:
83          sheet_PCI = 'PCI'
84          sheet_eUtran = 'eUtran Parameters'
85          PCI_col_label1 = 'EutranCellFDDId'
86          PCI_col_label2 = 'PCI'
87          eUtran_col_label1 = 'EutranCellFDDId'
88          eUtran_col_label2 = 'beamDirection'
```

3. BTU file check:

I. The **first sheet** should have the below *column labels* starting at ***row 12***:



PROJECT NUMBER 9701

Radio Engineering

LTE CELL Name (CELL_SITE)	EUTRAN_CELL_ID	EUTRAN_CELL_ID (HEX value)	Site Name	EMG	ESRD	ESN	Location Code
TBPX4	9665833	0937D29	TORONTO ST S & BANFF RD	TBP	9052119565	379	C6608
TBPX5	9665834	0937D2A	TORONTO ST S & BANFF RD	TBP	9052119566	379	C6608
TBPX6	9665835	0937D2B	TORONTO ST S & BANFF RD	TBP	9052119567	379	C6608
TBPXN	9665836	0937D2C	TORONTO ST S & BANFF RD	TBP	9052119571	379	C6608
TBPXP	9665837	0937D2D	TORONTO ST S & BANFF RD	TBP	9052119572	379	C6608
TBPXQ	9665838	0937D2E	TORONTO ST S & BANFF RD	TBP	9052119573	379	C6608
TBPXA	9665913	0937D79	TORONTO ST S & BANFF RD	TBP	9052119565	379	C6608
TBPXB	9665914	0937D7A	TORONTO ST S & BANFF RD	TBP	9052119566	379	C6608
TBPXC	9665915	0937D7B	TORONTO ST S & BANFF RD	TBP	9052119567	379	C6608
TBPX7	9665863	0937D47	TORONTO ST S & BANFF RD	TBP	9052119565	379	C6608
TBPX8	9665864	0937D48	TORONTO ST S & BANFF RD	TBP	9052119566	379	C6608
TBPX9	9665865	0937D49	TORONTO ST S & BANFF RD	TBP	9052119567	379	C6608
TBPXG	9665843	0937D33	TORONTO ST S & BANFF RD	TBP	9052119568	379	C6608
TBPXH	9665844	0937D34	TORONTO ST S & BANFF RD	TBP	9052119569	379	C6608
TBPXJ	9665845	0937D35	TORONTO ST S & BANFF RD	TBP	9052119570	379	C6608
TBPXD	9665813	0937D15	TORONTO ST S & BANFF RD	TBP	9052119568	379	C6608
TBPXE	9665814	0937D16	TORONTO ST S & BANFF RD	TBP	9052119569	379	C6608
TBPXF	9665815	0937D17	TORONTO ST S & BANFF RD	TBP	9052119570	379	C6608
TBPXK	9665816	0937D18	TORONTO ST S & BANFF RD	TBP	9052119568	379	C6608
TBPXL	9665817	0937D19	TORONTO ST S & BANFF RD	TBP	9052119569	379	C6608
TBPXM	9665818	0937D1A	TORONTO ST S & BANFF RD	TBP	9052119570	379	C6608

Eng'g, Roam'g & Mkt'g | Tables Summary

LTE CELL Name (CELL_SITE),

EUTRAN_CELL_ID,

EUTRAN_CELL_ID (HEX value),

Site Name,

EMG,

ESRD,

ESN,

Location Code

II. Corresponding code (line 113 - 120), one can modify the corresponding *varibles* to match with the *column labels*

```
112    try:##load BTU, try to look for the columns, if does not have, exception thrown
113        col_label1 = 'LTE CELL Name\n(CELL_SITE)'
114        col_label2 = 'EUTRAN_CELL_ID'
115        col_label3 = 'EUTRAN_CELL_ID\n(HEX value)'
116        col_label4 = 'ESRD'
117        col_label5 = 'ESN'
118        col_label6 = 'Site Name'
119        col_label7 = 'EMG'
120        col_label8 = 'Location Code'
```

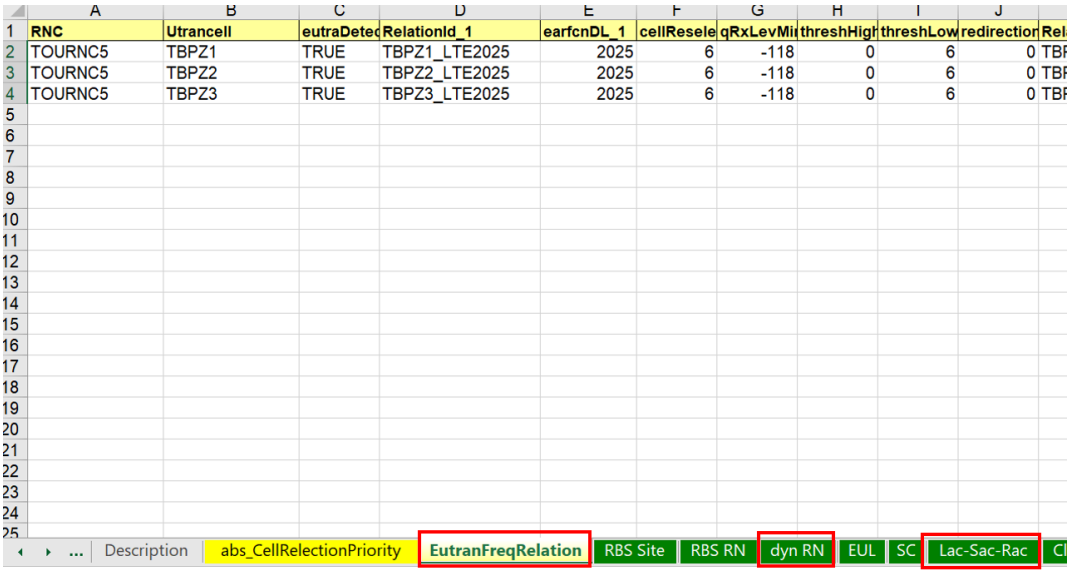
III. If the *column labels* in excel is not in ***row 12***, one can modify the below variable (line 121) to correspond to the ***row number*** of *column labels* in excel

```
121    row_number = 12
```

4. UMTS file check:

1. Data will be found from the following 3 ***worksheets***:

i. EutranFreqRelation, dyn RN, Lac-Sac-Rac



	A	B	C	D	E	F	G	H	I	J	
1	RNC	Utrancell	eutraDeted	RelationId_1	earfcnDL_1	cellResele	qRxLevMi	threshHigh	threshLow	redirectior	Rel
2	TOURNC5	TBPZ1	TRUE	TBPZ1_LTE2025	2025	6	-118	0	6	0	TBF
3	TOURNC5	TBPZ2	TRUE	TBPZ2_LTE2025	2025	6	-118	0	6	0	TBF
4	TOURNC5	TBPZ3	TRUE	TBPZ3_LTE2025	2025	6	-118	0	6	0	TBF

... | Description | abs_CellRelectionPriority | EutranFreqRelation | RBS Site | RBS RN | dyn RN | EUL | SC | Lac-Sac-Rac | Cl

2. In each **worksheets**, there should be the following *column labels*:

A	B
RNC	Utrancell
TOURNC5	TBPZ1
TOURNC5	TBPZ2
TOURNC5	TBPZ3

Sheet: EutranFreqRelation

B	E	F	AQ	AV
sector Number	cell Identity	Utran CellId	scrambling code	uarfcn Dl
1	25931	TBPZ1	484	1037
2	25932	TBPZ2	492	1037
3	25933	TBPZ3	500	1037

Sheet: dyn

C
UMTS LAC
60075
60075
60075

Sheet: Lac-Sac-Rac

3. The corresponding code (line 281 – 291)

```
281     umts_sheet1 = 'EutranFreqRelation'
282     umts_sheet2 = 'dyn RN'
283     umts_sheet3 = 'Lac-Sac-Rac'
284     Eutran_sheet_col1 = 'Utrancell'
285     Eutran_sheet_col2 = 'RNC'
286     dyn_RN_sheet_col1 = 'sector Number'
287     dyn_RN_sheet_col2 = 'cell Identity'
288     dyn_RN_sheet_col3 = 'uarfcn Dl'
289     dyn_RN_sheet_col4 = 'scrambling code'
290     dyn_RN_sheet_col5 = 'beam Direction'
291     Lac_Sac_Rac_sheet_col1 = 'UMTS LAC'
```

Appendix 2 – Other Functions

- Auto File Detect
  - ➢ This program will auto detect whether required files are provided and containing information of the RF site. Some examples are shown below:
    a. Case1: BTU file is not provided
       i. Auto File Detection result: FILE NOT FOUND
       ii. User can provide BTU into the program folder and hit Enter to proceed

```
AUTO FILE DETECTION: FILE NOT FOUND!
PLEASE READ ABOVE INSTRUCTIONS BEFORE PROCEED

if you have done the instructions, hit Enter to continue:
```

    b. Case2: UMTS file is provided VS not provided
       i. Auto File Detection result: shows also UMTS file

```
AUTO FILE DETECTION: FILES (INCLUDING RND_UMTS) ARE IN PLACE!
```

       ii. Auto File Detection result: No UMTS DETECTED

```
AUTO FILE DETECTION: FILES ARE IN PLACE! (RND_UMTS NOT DETECTED)
```

- Error Handling
  - ➢ This program has mechanism for Error, such as wrong input (EMG), provided files does not contain the site
    a. Case1: wrong input
       1. Error is raised when wrongly input, User is prompted to re-enter input

```
AUTO FILE DETECTION: FILES (INCLUDING RND_UMTS) ARE IN PLACE!

Please enter EMG (e.g T35JK) OR hit Enter to exit: 111
enter address (optional) OR hit Enter to skip:
enter your name as designer (optional) OR hit Enter to skip:

ERROR: ***EMG NOT FOUND IN PROVIDED REMEDY FILE***

if you enter the wrong EMG, enter 1 to re-enter EMG

if the file does not have info of the site, simply replace with the correct file
(make sure to change file name) and hit Enter:
```

    b. Case2: wrong RND file is provided (no containing data of the site)
       1. Auto File Detection result: FILE IN PLACE
       2. But ERROR is cached
       3. User can replace with the correct file and hit Enter to proceed

```
AUTO FILE DETECTION: FILES (INCLUDING RND_UMTS) ARE IN PLACE!

Please enter EMG (e.g T35JK) OR hit Enter to exit: tbp
enter address (optional) OR hit Enter to skip:
enter your name as designer (optional) OR hit Enter to skip:

ERROR: ***THIS SITE IS NOT IN THE PROVIDED RND FILE***

please provide the correct RND file
hit Enter to continue if the above instruction has been achieved:
```