```
In [62]:   from itertools import permutations
```

```
In [63]:   reg_combos = permutations(['A','B','C'],2)
```

```
In [64]:   list(reg_combos)
```

Out[64]:   [('A', 'B'), ('A', 'C'), ('B', 'A'), ('B', 'C'), ('C', 'A'), ('C', 'B')]

GENERATE RR TYPE INSTRUCTIONS

```
In [65]:   def generate_instr(start_opcode,instr_name,length,format):
               '''      '''
               opcode = start_opcode
               reg_combos = permutations(['A','B','C'],2)
               for pair in list(reg_combos):
                   print( "'" + instr_name + ' ' + pair[0] + ',' + pair[1]  +"'" + ',' +
           str(opcode) + ',' + str(length) + ',' + format)
                   opcode +=1
```

```
In [71]:   # MOV INSTR
           generate_instr(0,'MOV','01','01')

           'MOV A,B',0,01,01
           'MOV A,C',1,01,01
           'MOV B,A',2,01,01
           'MOV B,C',3,01,01
           'MOV C,A',4,01,01
           'MOV C,B',5,01,01
```

```
In [73]:   # ADD INSTR
           generate_instr(6,'ADD','01','01')

           'ADD A,B',6,01,01
           'ADD A,C',7,01,01
           'ADD B,A',8,01,01
           'ADD B,C',9,01,01
           'ADD C,A',10,01,01
           'ADD C,B',11,01,01
```

```
In [74]:   generate_instr(12,'SUB','01','01')

           'SUB A,B',12,01,01
           'SUB A,C',13,01,01
           'SUB B,A',14,01,01
           'SUB B,C',15,01,01
           'SUB C,A',16,01,01
           'SUB C,B',17,01,01
```

```
In [75]:  generate_instr(18,'MUL','01','01')
```

```
'MUL A,B',18,01,01
'MUL A,C',19,01,01
'MUL B,A',20,01,01
'MUL B,C',21,01,01
'MUL C,A',22,01,01
'MUL C,B',23,01,01
```

GENERATE IMMDEDIATE TYPE INSTRUCTIONS

```python
In [81]:  def generate_instr2(start_opcode,instr_name,length,format):
              '''
              '''
              opcode = start_opcode
              reg_list = ['A','B','C']
              for reg in reg_list:
                  print( "'" + instr_name + ' '+reg+",val'" + ',' + str(opcode) + ',' +
          str(length) + ',' + format)
                  opcode +=1
```

```
In [82]:  generate_instr2(24,'ROR','10','02')
```

```
'ROR A,val',24,10,02
'ROR B,val',25,10,02
'ROR C,val',26,10,02
```

```
In [84]:  generate_instr2(27,'ADD','10','02')
```

```
'ADD A,val',27,10,02
'ADD B,val',28,10,02
'ADD C,val',29,10,02
```

```
In [85]:  generate_instr2(30,'SUB','10','02')
```

```
'SUB A,val',30,10,02
'SUB B,val',31,10,02
'SUB C,val',32,10,02
```

```
In [86]:  generate_instr2(33,'MUL','10','02')
```

```
'MUL A,val',33,10,02
'MUL B,val',34,10,02
'MUL C,val',35,10,02
```

```
In [87]:  generate_instr2(36,'MOV','10','02')
```

```
'MOV A,val',36,10,02
'MOV B,val',37,10,02
'MOV C,val',38,10,02
```

In [ ]: