

SP ass 3:

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1. ALP:

```
        START 500
X  DC 65
        MOVER AREG, Y
        MOVEM BREG, ='11'
        ADD AREG, ='24'
        LTORG
        SUB BREG, ='15'
Y  DC 20
        ORIGIN 800
        LTORG
        BC DOWN
        MOVER AREG, NUM
DOWN MOVER CREG, NUM
        ADD BREG, ='17'
NUM DS 5
END
```

2. Symbol Table

X	500
Y	511
DOWN	804
NUM	808

Literal Table

= '11'	507
= '24'	508
= '15'	800
= '17'	813

Pool Table

0
2
3

3. Intermediate Code:

	(AD,01)	(C,500)
500	(DL,02)	(C,65)
501	(IS,04)	(RG,1)(S,1)
503	(IS,05)	(RG,2)(L,1)
505	(IS,01)	(RG,1)(L,2)
507	(AD,05)	(DL,02)(C,1)
508	(AD,05)	(DL,02)(C,2)
509	(IS,02)	(RG,2)(L,3)
511	(DL,02)	(C,20)
512	(AD,03)	(C,800)
800	(AD,05)	(DL,02)(C,1)
801	(IS,07)	(S,2)
802	(IS,04)	(RG,1)(S,3)
804	(IS,04)	(RG,3)(S,3)
806	(IS,01)	(RG,2)(L,4)
808	(DL,01)	(C,5)
813	(AD,02)	

4. Object Code:

```
500 (04) (001) (510)
502 (05) (002) (506)
504 (01) (001) (507)
506 (05) (000) (001)
507 (05) (000) (002)
508 (02) (002) (800)
511 (03) (800)
800 (05) (000) (001)
801 (07) (804)
802 (04) (001) (808)
804 (04) (003) (808)
806 (01) (002) (813)
```

5. Source Code:

```
from io import TextIOWrapper
```

```
MOT={
    'STOP':('00','IS',0),
    'ADD':('01','IS',2),
    'SUB':('02','IS',2),
    'MUL':('03','IS',2),
    'MOVER':('04','IS',2),
    'MOVEM':('05','IS',2),
    'COMP':('06','IS',2),
    'BC':('07','IS',1),
    'DIV':('08','IS',2),
    'READ':('09','IS',1),
    'DEC':('11','IS',1),
    'START':('01','AD',1),
    'END':('AD',0),
    'ORIGIN':('03','AD',1),
    'EQU':('04','AD',2),
    'LTORG':('05','AD',0),
    'DS':('01','DL',1),
    'DC':('02','DL',1)
}
```

```
REG={
    'AREG':1,
    'BREG':2,
    'CREG':3,
    'DREG':4
}
```

```
}
```

```
class files(object):
    ifp=open("tables/inter_code.txt",mode="r")
    lit=open("tables/literal_table.txt","r")
    litline = lit.read().splitlines()
    sym=open("tables/symbol_table.txt","r")
    symline = sym.read().splitlines()
    output=open("tables/output.txt","a+")
    output.truncate(0)

def getInst(s:str):
    i = s.removeprefix('(').removesuffix(')').split(sep=',')[-1]
    return "("+i+")\t"

def getS(s:str):
    a = s.split(sep=',')[-1]
    a = files.symline[int(a)].split(sep='\t')[-1]
    return a

def getL(s:str):
    a = s.split(sep=',')[-1]
    a = files.litline[int(a)-1].split(sep='\t')[-1]
    return a

def getC(s:str):
    a = s.split(sep=',')[-1]
    if len(a)<3:
        if len(a)<2:
            a = " (00"+a+")"
        else:
            a = " (0"+a+")"
    return a

def getRest(s:str):
    a='(000)'
    s=s.replace(')(', ' ').removeprefix('(').removesuffix(')').split()
    if 'RG' in s[0]:
        a = "(00"+s[0].split(',')[0][-1]+")"
    elif 'DL' in s[0]:
        a = "(000)"
    elif 'S' in s[0]:
        a = "("+getS(s[0])+")"
    else:
        a = s[0].split(',')[0][-1]
        if len(a)<3:
            if len(a)<2:
                a = "(00"+a+")"
            else:
                a = "(0"+a+")"
        else :
            a = "("+a+")"
```

```

if len(s) > 1:
    if 'S' in s[1]:
        a += " (" + getS(s[1]) + ")"
    if 'L' in s[1]:
        a += " (" + getL(s[1]) + ")"
    if 'C' in s[1]:
        a += getC(s[1])
return a

```

```

def pass_two(intermediateCode: TextIOWrapper):
    objectCode = ''
    i = ''
    r = ''
    l = 0
    for line in intermediateCode:
        l += 1
        if "(AD,01)" in line or "(AD,02)" in line:
            pass
        elif "DL" in line.split()[1]:
            pass
        else:
            words = line.split()
            i = getInst(words[1])
            r = getRest(words[2])
            objectCode += (words[0] + "\t" + i + r + "\n")
    files.output.writelines(objectCode)
    return

```

```

##Program execution starts here
pass_two(intermediateCode=files.ifp)

```