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Department of Computer Science and Engineering
Session: 2022-2023

Compiler Design Lab

PRACTICAL No. 5

Topic: Three Address Code Generation

Platform: Windows or Linux

Language to be used: Python

CO Mapped: CO4- Learn three address code generation and implement code optimization techniques for improving the performance of a program segment.

Aim: Write a program to generate three address code for the given language construct using SDTS.

(a) Batch E1 : if-then-else

```
In [4]: from prettytable import PrettyTable

x1 = PrettyTable()

code = open('if.txt', 'r')

lines = code.read().splitlines()
print('The Statement is :\n')
for i in lines:
    print('\t', i)

individual_lines = []

for entry in lines:
    x = []
    x = entry.split(" ")
    individual_lines.append(x)

goto, code1 = [], []
for i in range(len(lines)):
    a = []
    if 'if' in lines[i]:
        a.append(lines[i])
        a.append('goto()')
        code1.append(a)
    elif 'return' in lines[i]:
        a.append('t1')
        a.append('=')
        a.append(individual_lines[i][-1][:len(individual_lines[i][-1])-1])
        code1.append(a)
        if 'if' in lines[i-1]:
            code1.append(['goto()'])
        else:
            goto.append(len(code1))
    elif 'else' not in lines[i]:
        a.append(lines[i])
        code1.append(a)

goto.append(len(code1)+1)

for i in range(len(code1)):
    if 'if' in code1[i][0]:
        code1[i][0] = code1[i][0].replace('A<B', '!A<B')
```

```

j=-1
for i in range(len(code1)):
    if 'goto()' in code1[i][0]:
        j+=1
        code1[i][0] = code1[i][0].replace('goto()', 'goto('+str(goto[j])+')')
    elif 'goto()' in code1[i][-1]:
        j+=1
        code1[i][-1] = code1[i][-1].replace('goto()', 'goto('+str(goto[j])+')')

x1.field_names = ['Index', 'Code']
for i in range(len(code1)):
    code2 = ""
    for j in code1[i]:
        code2 += j
    x1.add_row([i+1, code2])

x1.add_row([len(code1)+1, "END"])
print('\n\nThe Three Address Code Generated is :')
print(x1)

```

Output -

The Statement is :

```

X = 1;
Y = 2;
if (X<Y)
    c=X+Y
    return c;
else
    d=X-Y
    return d;

```

The Three Address Code Generated is :

+-----+		
Index	Code	
+-----+		
1	X = 1;	
2	Y = 2;	
3	if (X<Y)goto(5)	
4	c=X+Y	
5	t1=c	
6	d=X-Y	
7	t1=d	
8	END	
+-----+		