

Compiler Design Lab

Name:- Krishna Mundada

Roll:-45

PRACTICAL No. 5

Topic: Three Address Code Generation

Platform: Windows or Linux

Language to be used: Python or Java (based on the companies targeted for placement)

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.

Batch E3: while loop

Input: **Example for if-then-else**

```
if (a<5)
{
    c= b+d
    d= i+j
}
else
{
    d= a+ b
    k= x+y
}
```

Output:

- 1) if (a<5) goto 3
- 2) Goto_8
- 3) T1=b+d
- 4) c=T1
- 5) T2=i+j
- 6) d=T2
- 7) goto 12
- 8) T3=a+b
- 9) d=T3
- 10) T4=x+y
- 11) k=T4
- 12) END

Code:-

```
from prettytable import PrettyTable

def while_loop(cleaned_code):
    final_code = []
    while_idx = None
    for i in range(len(cleaned_code)):
        codeline = cleaned_code[i]

        if 'while' in codeline:
            while_idx = i
            # The loop condition would be enclosed in brackets
            start_idx = codeline.index('(')
            end_idx = codeline.index(')')
            # Select the substring between start_idx and end_idx
            bool_condn = ''.join(codeline[start_idx:end_idx+1])
            final_code.append('if !{} goto({})'.format(bool_condn, None))
            while_idx = i
        elif '}' in codeline:
            final_code.append('goto({})'.format(while_idx+1))
            final_code[while_idx] =
final_code[while_idx].replace('None', str(i+2))
            while_idx = None
        else:
            final_code.append(codeline)
    return final_code

with open('code.txt') as f:
    code = f.readlines()

print('The Statement is:')
print(''.join(code))

cleaned_code = []
for i in range(len(code)):
    if code[i] != '\n':
        if code[i][-1] == '\n':
            # don't include the \n at the end of each line
            cleaned_code.append(code[i][: -1].strip())
        else:
            cleaned_code.append(code[i].strip())

final_code = while_loop(cleaned_code)

final_code.append('END')
```

```

print('\nThe Three Code Generated is:')
x1 = PrettyTable()
x1.field_names = ['Index', 'Code']
for i in range(len(final_code)):
    x1.add_row([i+1, final_code[i]])

print(x1)

```

Output:-

```

PROBLEMS 1 OUTPUT TERMINAL JUPYTER DEBUG CONSOLE

PS C:\Users\asus\OneDrive\Desktop\college_sem\5th sem\cd_lab> cd prac5
PS C:\Users\asus\OneDrive\Desktop\college_sem\5th sem\cd_lab\prac5> python -u "c:\Users\asus\OneDrive\Desktop\college_sem\5th sem\cd_lab\prac5\prog5.py"
The Statement is:
c = 0
a = 1
b = 2
| Index |          Code          |
+-----+-----+
| 1      |      c = 0             |
| 2      |      a = 1             |
| 3      |      b = 2             |
| 4      | if !(a < b) goto(7)     |
| 5      |      c = 1             |
| 6      |      goto(4)            |
| 7      |      c = 0             |
| 8      |      END               |
+-----+-----+
PS C:\Users\asus\OneDrive\Desktop\college_sem\5th sem\cd_lab\prac5> 

```

Share Ln 52, Col 10 (1566 selected) Spaces: 4 UTF-8 CRLF