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Practical No. 5

AIM - Write a program to generate three address code for the given language construct using SDTS for while loop.

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
                  start_idx = codeline.index('(')
                  end_idx = codeline.index(')')
                  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('code1.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':

                  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)
```

c = 0
a = 1
b = 2
while(a < b){
c = c + 1
a = a + 1
}
c = 0

Execution Screenshot

```
The Statement is:
c = 0
a = 1
b = 2
while(a < b){
c = c + 1
a = a + 1
}
c = 0


The Three Code Generated is:
+-------+---------------------+
| Index |         Code        |
+-------+---------------------+
|   1   |        c = 0        |
|   2   |        a = 1        |
|   3   |        b = 2        |
|   4   | if !(a < b) goto(8) |
|   5   |      c = c + 1      |
|   6   |      a = a + 1      |
|   7   |       goto(4)       |
|   8   |        c = 0        |
|   9   |         END         |
+-------+---------------------+
```