24/9/2020
Thursday

Week 7

1. Write a lex program to convert the following while statement to a for statement

Input (q1sample.txt)

```
x=0;
while(x<3){
  print x;
  x=x+1;
}
```

OUTPUT

```
for(x=0;x<3;){
    print x; x=x+1;
}
```

~~q1sample.txt~~

```
%{
#include<bits/stdc++.h>
using namespace std;
String init="", cond="", body="";
%}

%%
. init+=yytext;
"while".*"}" {
        int i=0;
        while(yytext[i]!='(')i++;
        i++;
        while(yytext[i]!=')') { cond += yytext[i]; i++; }
        i++;
        while(yytext[i]!='{')i++;
        i++;
        while(yytext[i]!='}') { body += yytext[i]; i++; }
        i++;
}
%%
int main(){
        yyin = fopen("q1.sample.txt","r");
        yylex();
        cout<<"for("<<init<<cond<<";){\n\t"<<body<<"\n}\n";
        return 0;
}
```

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```
srihari@LAPTOP-AJMTFS87:~/compiler_design/week7$ cat q1.l
%{
#include<bits/stdc++.h>
using namespace std;
string init="",cond="",body="";
%}

%%
. init+=yytext;

"while".*"}" {
        int i=0;
        while(yytext[i] != '(')i++;
        i++;

        while(yytext[i] != ')'){
                cond += yytext[i];i++;
        }
        i++;

        while(yytext[i] != '{')i++;
        i++;

        while(yytext[i] != '}'){
                body += yytext[i];
                i++;
        }
        i++;
}
%%

int main(){
        yyin = fopen("q1sample.txt","r");
        yylex();
        cout<<"for("<<init<<cond<<";){\n\t"<<body<<"\n}\n";
        return 0;
}
srihari@LAPTOP-AJMTFS87:~/compiler_design/week7$ cat q1sample.txt
x = 0;while(x < 3){print  x;x = x + 1;}
srihari@LAPTOP-AJMTFS87:~/compiler_design/week7$ ./a.out

for(x = 0;x < 3;){
        print  x;x = x + 1;
}
srihari@LAPTOP-AJMTFS87:~/compiler_design/week7$
```

2. Convert the given switchCase statement to elseif statement

Input (93sample.txt)

```
switch (expression)
{
   case value1:
      statement1;
      break;
   case value2:
      statement2;
      break;
   default:
      statementDefault;
}
```

OUTPUT

```
if (expression == value1){
      statement1; break;
}
else if (expression == value2){
      statement2; break;
}
else {
      statementDefault;
}
```

```
%{
#include<stdio.h>
%}
%%
"switch".*"{"{
        int i=0;
        while (yytext[i] != '(') i++;
         i++;

        int expr = i;
        while (yytext [i] != ')') i++;
         int temp =0;

        do{
            i+=5;
            if(temp ==0) printf(" if (");
            else   printf(" else if(");

          temp= expr;

          while (yytext[_temp] != ')') {
              printf("%c", yytext[temp]);
              temp++;
          }
```

```
        printf("==");
        while(yytext[i] != ':'){
            printf("%c", yytext[i]);
            i++;
        }
        printf(")");
        printf("{\n\t");
        i++;

        while(yytext[i] != 'c' && yytext[i] != 'd'){
            printf("%c", yytext[i]);
            i++;
        }
        printf("\n}\n");
    }while(yytext[i] != 'd');

    printf("else {\n");
    i+=8;
    while(yytext[i] != '}'){
        printf("%c", yytext[i]);
        i++;
    }
    printf("\n}");
}


%%
int main(){
    yyin = fopen("qSsample.txt", "r");
    yylex();
    return 0;
}
```

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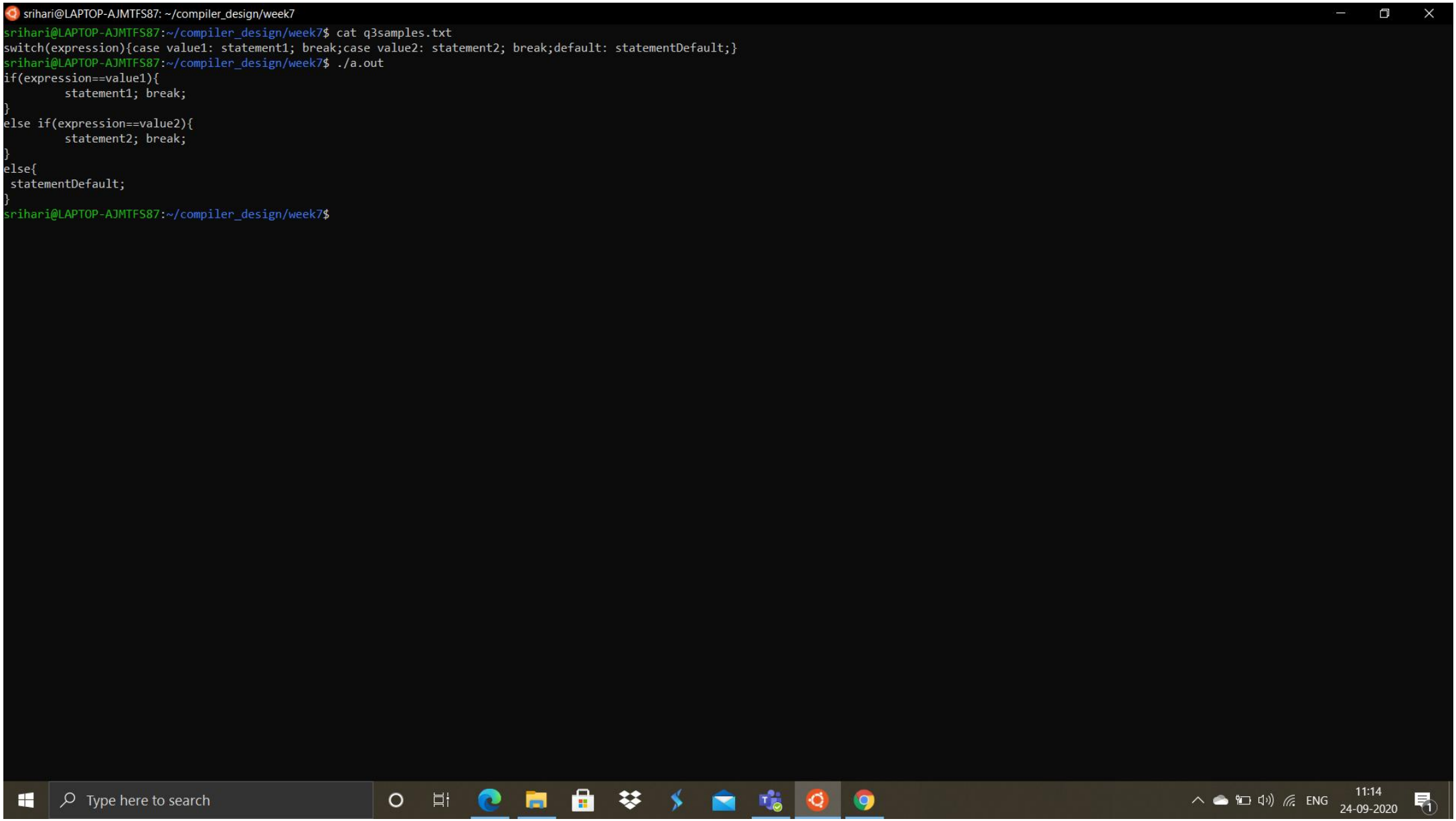
```
srihari@LAPTOP-AJMTFS87:~/compiler_design/week7$ cat q3.l
%{
#include<stdio.h>
%}
%%
"switch".*"}" {
        int i=0;
        while(yytext[i]!='(')i++;
        i++;

        int expr=i;
        while(yytext[i]!='c')i++;
        int temp=0;
        do{
                i+=5;
                if(temp==0)
                        printf("if(");
                else
                        printf("else if(");
                temp=expr;

                while(yytext[temp]!=')'){printf("%c",yytext[temp]);temp++;}
                printf("==");

                while(yytext[i]!=':'){printf("%c",yytext[i]);i++;}
                printf(")");

                printf("{\n\t");
                i++;

                while(yytext[i]!='c'&&yytext[i]!='d'){printf("%c",yytext[i]);i++;};
                printf("\n}\n");
        }while(yytext[i]!='d');

        printf("else{\n");
        i+=8;
        while(yytext[i]!='}'){printf("%c",yytext[i]);i++;}
        printf("\n}");
}
. ;
%%
int main()
{
yyin = fopen("q3samples.txt","r");
yylex();
return 0;
}
srihari@LAPTOP-AJMTFS87:~/compiler_design/week7$
```


srihari@LAPTOP-AJMTFS87: ~/compiler_design/week7
srihari@LAPTOP-AJMTFS87:~/compiler_design/week7$ cat q3samples.txt
switch(expression){case value1: statement1; break;case value2: statement2; break;default: statementDefault;}
srihari@LAPTOP-AJMTFS87:~/compiler_design/week7$ ./a.out
if(expression==value1){
statement1; break;
}
else if(expression==value2){
statement2; break;
}
else{
statementDefault;
}
srihari@LAPTOP-AJMTFS87:~/compiler_design/week7$
Type here to search
ENG
11:14
24-09-2020

3. Write a lex program to convert the following nested for loop statement to nested do-while statement.

Input (q2sample.txt)

```
for(init ;Condition; increment){
  for(init ;condition;increment){
      statement(s);
  }
statement(s);
}
```

OUTPUT

```
init
do{
   init
   do{
      Statement(s);
      increment;
   }while(condition);
   Statement(s);
   increment;
}while(condition);
```

```
%{
#include <bits/stdc++.h>
using namespace std;
String x1="", x2="", ye1="", ye2="", z1="", z2="", b1="", b2="";
%}
%%
"for"."("."for".")"."{"{
    int i=0;
    while(yytext[i] != '(') i++;
    i++;
    while(yytext[i] != ';'){ x1+=yytext[i];i++;} i++;
    while(yytext[i] != ';'){ ye1+=yytext[i]; i++;} i++;
    while(yytext[i] != ')'){ z1+=yytext[i];i++;}i++;
    while(yytext[i] != '{') i++;
    i++;
    while(yytext[i] != '(') i++;
     i++;
    while(yytext[i] != ';'){ x2+=yytext[i];i++; }
    i++;
    while(yytext[i] != ';'){ye2+=yytext[i];i++;} i++;
```

```
while(yytext[i] != ';'){z2 += yytext[i]; i++;} i++;
while(yytext[i] != '{') i++;
i++;
while(yytext[i] != '}'){ b2 += yytext[i]; i++;}
i++;
while (yytext[i] != '}'){ b1 += yytext[i]; i++;}
i++;
}
;
//.
int main(){
    yyin = fopen("q2sample.txt", "r");
    yylex();
    cout<<x1<<endl<<"do{\n\t"<<x2<<"\n\t\t"<< b2 <<
        "\n\t\t"<<z2<<";\n\t) while("<<ye2<<" ); \n\n t"<<
        b1<<"\n\t"<<z1<<";\n}while ("<<ye1<<");";
    return 0;
}
```

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```
#include<bits/stdc++.h>
using namespace std;
string x1="",x2="",ye1="",ye2="",z1="",z2="",b1="",b2="";
%}
%%
"for".*"for".*"}" {
        int i=0;
        while(yytext[i] != '(')i++;
        i++;
        while(yytext[i] != ';'){x1 += yytext[i];i++;}i++;
        while(yytext[i] != ';'){ye1 += yytext[i];i++;}i++;
        while(yytext[i] != ')'){z1 += yytext[i];i++;}i++;
        while(yytext[i] != '{')i++;
        i++;
        while(yytext[i] != '(')i++;
        i++;
        while(yytext[i] != ';'){  x2 += yytext[i];i++;  }
        i++;
        while(yytext[i] != ';'){  ye2 += yytext[i];i++;  }
        i++;
        while(yytext[i] != ')'){  z2 += yytext[i];i++;  }
        i++;
        while(yytext[i] != '{')i++;
        i++;
             while(yytext[i] != '}'){b2 += yytext[i];i++;}
        i++;
        while(yytext[i] != '}'){b1 += yytext[i];i++;}
        i++;
}
. ;
%%
int main(){
        yyin = fopen("q2sample.txt","r");
        yylex();
        cout<<x1<<endl<<"do{\n\t"<<x2<<"\n\tdo{\n\t\t"<<b2<<"\n\t\t"<<z2<<";\n\t}while("<<ye2<<");\n\n\t"<<b1<<"\n\t"<<z1<<";\n}while("<<ye1<<");";
        return 0;
}
srihari@LAPTOP-AJMTFS87:~/compiler_design/week7$ ./a.out

 init
do{
         init
        do{
                statement(s);
                 increment ;
        }while( condition);

        statement(s);
         increment ;
}while( condition);srihari@LAPTOP-AJMTFS87:~/compiler_design/week7$
```