

UE20CS353-CD ASSIGNMENT-1

NAME	SRN	CLASS & SECTION
VIJAY J	PES2UG20CS815	6 - J

1. lexer.l code:

```
lexer.l
~/PESU/6th Sem/CD/Assignment/PES2UG20CS815

1 %{
2 //Name:Vijay J
3 //SRN: PES2UG20CS815
4 //SECTION:J
5 #include "y.tab.h"
6 void yyerror(char *s);
7 int yylineno;
8 %}
9 letter [a-zA-Z_]
10 digit [0-9]
11 sign [+]?
12 fraction (\.{digit}+)?
13 exp ([Ee][+]{digit}+)?
14 number {sign}{digit}*{fraction}{exp}
15 id {letter}({letter}|{digit})*
16 %x state
17 %%
18 "//".* ;
19 \/* {yyerror(); BEGIN state;}
20 <state>[' '\t] {yyerror(); BEGIN state;}
21 <state>[\n] {yyerror(); ++yylineno; BEGIN state;}
22 <state>[^\\*] {yyerror(); BEGIN state;}
23 <state>"*" [^/] {yyerror(); BEGIN state;}
24 <state>"*" \ / BEGIN 0 ;
25 main return MAIN;
26 int return INT;
27 char return CHAR;
28 float return FLOAT;
29 double return DOUBLE;
30 for return FOR;
31 do return DO;
32 while return WHILE;
33 if return IF;
```

```

34 else return ELSE;
35 #include return INCLUDE;
36 {id} return ID;
37 "+" return *yytext;
38 "-" return *yytext;
39 {number} return NUMBER;
40 {id}\\.h return HEADER;
41 "++" return INC;
42 "--" return DEC;
43 ">=" return GREATEREQ;
44 "<=" return LESSEREQ;
45 "==" return EQCOMP;
46 "!=" return NOTEQ;
47 "&&" return ANDAND;
48 "||" return OROR;
49 \r ;
50 \t ;
51 [' ' ] ;
52 \n { ++yylineno; };
53 . return *yytext;
54 %%
55 int yywrap()
56 {
57 return(1);
58 }

```

2. parsery code:

```

parsery
~/PESU/6th Sem/CD/Assignment/PES2UG20CS815

1 %{
2 //NAME: Vijay J
3 //SRN: PES2UG20CS815
4 //SECTION: J
5 #include<stdio.h>
6 #include<stdlib.h>
7 int yylex();
8 void yyerror(char *s);
9 extern int yylineno;
10 extern char *yytext;
11 %}
12 %token INT FLOAT DOUBLE CHAR FOR WHILE DO IF ELSE INCLUDE MAIN ID NUMBER HEADER
13 GREATEREQ LESSEREQ EQCOMP NOTEQ INC DEC ANDAND OROR
14 %left '+' '-'
15 %left '*' '/'
16 %%
17 Start : Prog { printf("Declarations are valid.\n"); YYACCEPT; };
18 Prog: INCLUDE '<' HEADER '>' Prog | MainF Prog | Declr ';' Prog | Assgn ';' Prog |
19 ArrayDecl ';' Prog | error ';' {yyerrok;yyclearin;} Prog |;
20 ArrayDecl: ID Bracket;
21 Bracket: '[' NUMBER ']' Bracket| '[' ID ']'Bracket| ;
22 Declr: Type ListVar;
23 ListVar: ListVar ',' ID | InitDeclr | ArrayDecl | ID;
24 InitDeclr: Assgn ',' InitDeclr | Assgn;
25 Type: INT | FLOAT | DOUBLE | CHAR;
26 Unary_operator: '&' | '*' | '+' | '-' | '~' | '!';
27 IncDec: INC | DEC ;
28 Assgn: ID '=' Expr | ID '=' Logical | ArrayDecl '=' Expr | ArrayDecl '=' Logical;
29 Logical: ID ANDAND Logical | ID OROR Logical | ID;
30 Expr: Expr Relop E | Unary_operator ID | ID IncDec | E;
31 Relop: '<' | '>' | LESSEREQ | GREATEREQ | EQCOMP | NOTEQ;
32 E: E '+' T | E '-' T | T;
33 T: T '*' F | T '/' F | F;

```

```

34 F: '(' Expr ')' | ID | NUMBER;
35 MainF: Type MAIN '(' Empty_ListVar ')' '{' Stmt '}';
36 Empty_ListVar: ListVar | ;
37 Stmt: SingleStmt Stmt | Block Stmt | ;
38 SingleStmt: Declr ';' | Assgn ';' | Cond ';' | IF '(' Cond ')' Stmt | IF '(' Cond
39 ')' Stmt ELSE Stmt | WhileL | ForL | DoWhileL | error ';' {yyerrok;yyclearin;};
40 Block: '{' Stmt '}';
41 WhileL: WHILE '(' Cond ')' Loop_body;
42 Cond: Expr | Assgn | Logical;
43 Loop_body: '{' Stmt '}' | ;
44 multi_expression: Cond | Type Cond | multi_expression ',' Cond;
45 expression_statement : ';' | multi_expression ';';
46 ForL: FOR '(' expression_statement expression_statement multi_expression ')'
47 Loop_body;
48 DoWhileL: DO Loop_body WHILE '(' Cond ')' ';';
49 %%
50 void yyerror(char *s)
51 {
52     printf("Error: %s, Line number: %d, Token: %s\n", s, yylineno, yytext);
53 }
54 int main()
55 {
56     if(!yyparse())
57     {
58         printf("Parsing Successful\n");
59     }
60     else
61     {
62         printf("Unsuccessful\n");
63     }
64     return 0;
65 }

```

3.run.sh code:

```

run.sh
~/PESU/6th Sem/CD/Assignment/PES2UG20CS815
1 #!/bin/bash
2
3 lex lexer.l
4 yacc -d parser.y -Wno
5 gcc -g y.tab.c lex.yy.c
6
7

```

4.Input codes And Output :

Forloop_valid.c

```

forloop_valid.c
~/PESU/6th Sem/CD/Assignment/PES2UG20...
1 #include<stdio.h>
2 int main(){
3     int a=1;
4     for(int i=0;i<10;i++){
5         a++;
6     }
7 }

```

Output

```
~/P/6/C/A/PES2UG20CS815

yoyo@zaemon in ~/PESU/6th Sem/CD/Assignment/PES2UG20CS815 via C v12.2.1-gcc took 34ms
λ ./run.sh

yoyo@zaemon in ~/PESU/6th Sem/CD/Assignment/PES2UG20CS815 via C v12.2.1-gcc took 1s
λ ./a.out<forloop_valid.c
Declarations are valid.
Parsing Successful
```

Forloop_invalid.c

```
Open  forloop_invalid.c  Save
~/PESU/6th Sem/CD/Assignment/PES2UG20...

1 #include<stdio.h>
2 int min()
3 {
4     int count = 0;
5     for(int i = 0 ; i < 20 ; i++)
6     {
7         count++;
8     }
9     return 0;
10 }
```

Output

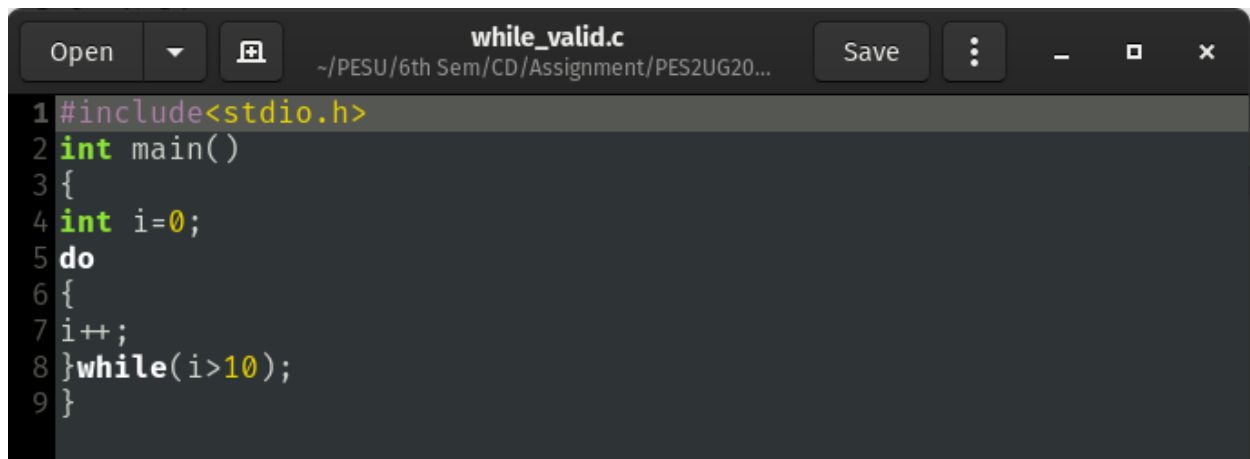
```
~/P/6/C/A/PES2UG20CS815

yoyo@zaemon in ~/PESU/6th Sem/CD/Assignment/PES2UG20CS815 via C v12.2.1-gcc took 2ms
λ ./run.sh

yoyo@zaemon in ~/PESU/6th Sem/CD/Assignment/PES2UG20CS815 via C v12.2.1-gcc took 402ms
λ ./a.out<forloop_invalid.c
Error: syntax error, Line number: 2, Token: (
Error: syntax error, Line number: 5, Token: for
Error: syntax error, Line number: 5, Token: <
Error: syntax error, Line number: 5, Token: ++
Error: syntax error, Line number: 8, Token: }
Error: syntax error, Line number: 10, Token: }
Unsuccessful

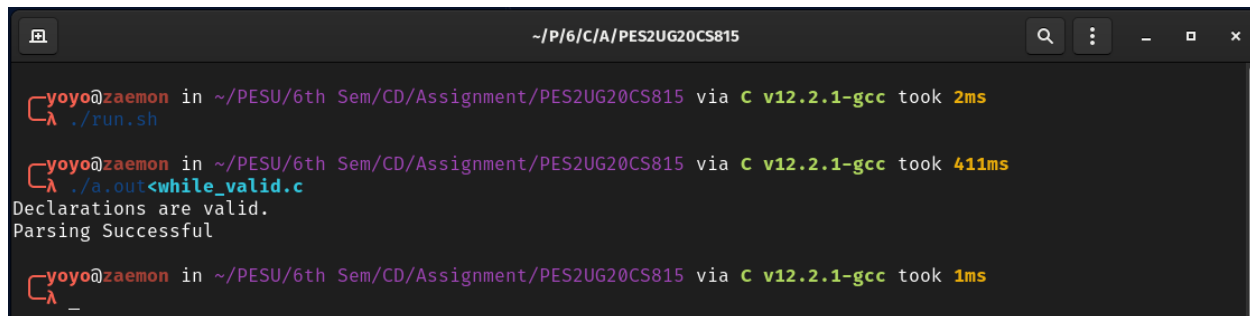
yoyo@zaemon in ~/PESU/6th Sem/CD/Assignment/PES2UG20CS815 via C v12.2.1-gcc took 3ms
λ _
```

While_valid.c



```
1 #include<stdio.h>
2 int main()
3 {
4     int i=0;
5     do
6     {
7         i++;
8     }while(i>10);
9 }
```

Output

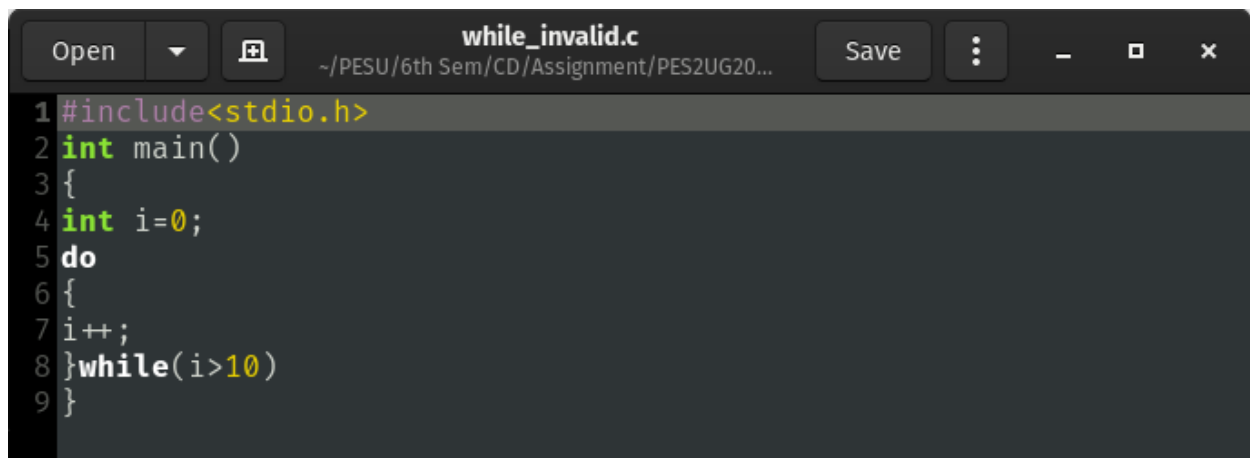


```
yoyo@zaemon in ~/PESU/6th Sem/CD/Assignment/PES2UG20CS815 via C v12.2.1-gcc took 2ms
λ ./run.sh

yoyo@zaemon in ~/PESU/6th Sem/CD/Assignment/PES2UG20CS815 via C v12.2.1-gcc took 411ms
λ ./a.out<while_valid.c
Declarations are valid.
Parsing Successful

yoyo@zaemon in ~/PESU/6th Sem/CD/Assignment/PES2UG20CS815 via C v12.2.1-gcc took 1ms
λ _
```

While_invalid.c



```
1 #include<stdio.h>
2 int main()
3 {
4     int i=0;
5     do
6     {
7         i++;
8     }while(i>10)
9 }
```

Output

```
~/P/6/C/A/PES2UG20CS815

yoyo@zaemon in ~/PESU/6th Sem/CD/Assignment/PES2UG20CS815 via C v12.2.1-gcc took 2ms
λ ./run.sh

yoyo@zaemon in ~/PESU/6th Sem/CD/Assignment/PES2UG20CS815 via C v12.2.1-gcc took 406ms
λ ./a.out<while_invalid.c
Error: syntax error, Line number: 9, Token: }
Unsuccessful

yoyo@zaemon in ~/PESU/6th Sem/CD/Assignment/PES2UG20CS815 via C v12.2.1-gcc took 1ms
λ _
```

Array_valid.c

```
array_valid.c

1 #include<stdio.h>
2 int main()
3 {
4     int a[2][3];
5     int b[2];
6     int c[6][6][7][8];
7 }
```

Output

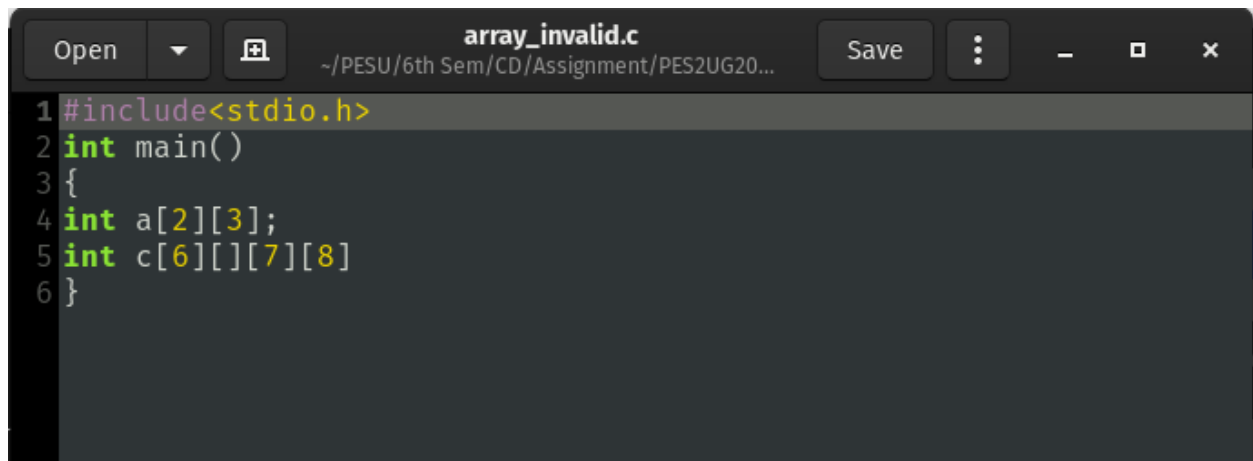
```
~/P/6/C/A/PES2UG20CS815

yoyo@zaemon in ~/PESU/6th Sem/CD/Assignment/PES2UG20CS815 via C v12.2.1-gcc took 2ms
λ ./run.sh

yoyo@zaemon in ~/PESU/6th Sem/CD/Assignment/PES2UG20CS815 via C v12.2.1-gcc took 408ms
λ ./a.out<array_valid.c
Declarations are valid.
Parsing Successful

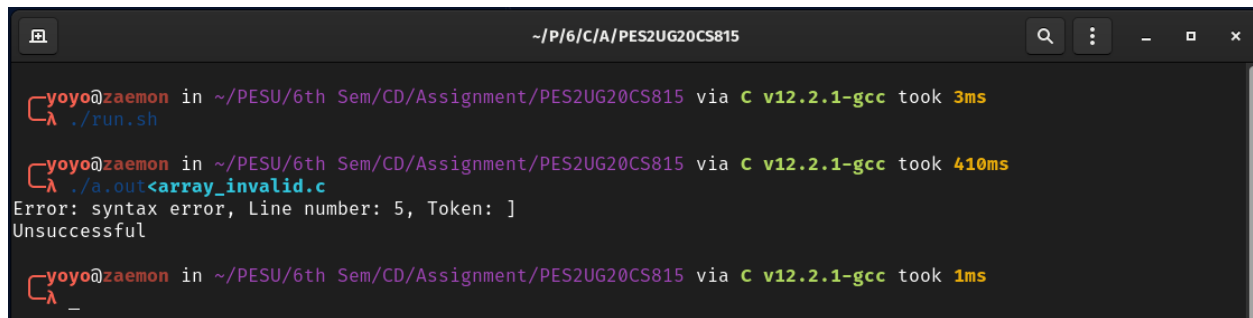
yoyo@zaemon in ~/PESU/6th Sem/CD/Assignment/PES2UG20CS815 via C v12.2.1-gcc took 2ms
λ _
```

Array_invalid.c



```
1 #include<stdio.h>
2 int main()
3 {
4     int a[2][3];
5     int c[6][][7][8]
6 }
```

Output



```
~/P/6/C/A/PES2UG20CS815
yoyo@zaemon in ~/PESU/6th Sem/CD/Assignment/PES2UG20CS815 via C v12.2.1-gcc took 3ms
λ ./run.sh

yoyo@zaemon in ~/PESU/6th Sem/CD/Assignment/PES2UG20CS815 via C v12.2.1-gcc took 410ms
λ ./a.out<array_invalid.c>
Error: syntax error, Line number: 5, Token: ]
Unsuccessful

yoyo@zaemon in ~/PESU/6th Sem/CD/Assignment/PES2UG20CS815 via C v12.2.1-gcc took 1ms
λ _
```