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Semester:- 5th
Section:- C
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CD LAB 8

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

#include "q1.c"

void prog();
void dec();
void ilist();
void iprime();
void dtype();
void slist();
void s();
void AS();
void expn();
void eprime();
void se();
void seprime();
void t();
void tprime();
void f();
void relop();
void ao();
void mo();

struct token tkn;
FILE *f1;

void invalid()
{
    printf("~~~~~INVALID~~~~~\n");
    exit(0);
}

void valid()
{
    printf("~~~~~SUCCESS~~~~~\n");
    exit(0);
}
```

```

void updatecurrent()
{
    tkn=getNextToken(f1);
}

void prog()
{
    updatecurrent();
    if(strcmp(tkn.lexemeName,"main")==0)
    {
        updatecurrent();
        if(strcmp(tkn.lexemeName,"(")==0)
        {
            updatecurrent();
            if(strcmp(tkn.lexemeName,"")!=0)
            {
                updatecurrent();
                if(strcmp(tkn.lexemeName,"{")==0)
                {
                    dec();
                    slist();
                    updatecurrent();
                    if(strcmp(tkn.lexemeName,"}")!=0)
                        invalid();
                }
                else
                    invalid();
            }
            else
                invalid();
        }
        else
            invalid();
    }
    else
        invalid();
}

void dec()
{
    updatecurrent();
    if(strcmp(tkn.lexemeName,"int")==0||strcmp(tkn.lexemeName,"char")==0)
    {
        dtype();
        ilist();
        if(strcmp(tkn.lexemeName,";")==0)
        {
            dec();
        }
        else
            invalid();
    }
}

```

```

        else
            return;
    }

void slist()
{
    if(strcmp(tkn.lexemeName,"id")==0)
    {
        s();
        if(strcmp(tkn.lexemeName,"id")==0)
        {
            slist();
        }
    }
    else
        return;
}

void s()
{
    AS();
    updatecurrent();
    if(strcmp(tkn.lexemeName,";")!=0)
        invalid();
}

void AS()
{
    if(strcmp(tkn.lexemeName,"id")==0)
    {
        updatecurrent();
        if(strcmp(tkn.lexemeName,"=")==0)
        {
            expn();
        }
        else
            invalid();
    }
    else
        invalid();
}

void expn()
{
    se();
    eprime();
}

void se()
{
    t();
    seprime();
}

```

```

}

void t()
{
    f();
    tprime();
}

void f()
{
    updatecurrent();
    if(strcmp(tkn.lexemeName,"id")!=0&&strcmp(tkn.lexemeName,"num")!=0)
        invalid();
}

void seprime()
{
    if(strcmp(tkn.lexemeName,"+")==0||strcmp(tkn.lexemeName,"-")==0)
    {
        ao();
        t();
        seprime();
    }
    else
        return;
}

void tprime()
{
    if(strcmp(tkn.lexemeName,"*")==0||strcmp(tkn.lexemeName,"/")==0||strcmp(tkn.lexemeName,"%")==0)
    {
        mo();
        f();
        tprime();
    }
    else
        return;
}

void eprime()
{
    if(strcmp(tkn.lexemeName,"==")==0||strcmp(tkn.lexemeName,"!=")==0||strcmp(tkn.lexemeName,"<=")==0||strcmp(tkn.lexemeName,">=")==0||strcmp(tkn.lexemeName,"<")==0||strcmp(tkn.lexemeName,">")==0)
    {
        relop();
        se();
    }
    else

```

```

        return;
    }

    void relop()
    {
        updatecurrent();

        if(strcmp(tkn.lexemeName,"==")!=0&&strcmp(tkn.lexemeName,"!=")!=0&&strcmp(tkn.lexemeName,"<=")!=0&&strcmp(tkn.lexemeName,">=")!=0&&strcmp(tkn.lexemeName,">")!=0&&strcmp(tkn.lexemeName,"<")!=0)
            invalid();
    }

    void ao()
    {
        updatecurrent();
        if(strcmp(tkn.lexemeName,"+")!=0&&strcmp(tkn.lexemeName,"-")!=0)
            invalid();
    }

    void mo()
    {
        updatecurrent();

        if(strcmp(tkn.lexemeName,"*")!=0&&strcmp(tkn.lexemeName,"/")!=0&&strcmp(tkn.lexemeName,"%")!=0)
            invalid();
    }

    void dtype()
    {
        if(strcmp(tkn.lexemeName,"int")!=0&&strcmp(tkn.lexemeName,"char")!=0)
            invalid();
    }

    void ilist()
    {
        updatecurrent();
        if(strcmp(tkn.lexemeName,"id")!=0)
            invalid();
        iprime();
    }

    void iprime()
    {
        updatecurrent();
        if(strcmp(tkn.lexemeName,",")==0)
            ilist();
        else if(strcmp(tkn.lexemeName,"[")==0)
        {
            updatecurrent();
            if(strcmp(tkn.lexemeName,"num")==0)

```

```

        {
            updatecurrent();
            if(strcmp(tkn.lexemeName,""]")==0)
            {
                updatecurrent();
                if(strcmp(tkn.lexemeName,",")==0)
                {
                    ilist();
                }
                else
                    return;
            }
            else
                invalid();
        }
        else invalid();
    }
    else
        return;
}

void parse()
{
    prog();
    valid();
}

int main()
{
    f1 = fopen("input.c","r");
    if(f1==NULL)
    {
        printf("File does not exist!!!\n");
        exit(0);
    }
    parse();
}

```

OUTPUT:-

Case 1:-

```

main()
{
    int b;
    int a[100];
    char b,c;
    a = 5;
}

```


The screenshot shows a code editor with four tabs: `parse.c`, `abcd.c`, `input.c`, and `q1.c`. The `parse.c` tab is active, displaying the following C code:

```
main()
{
    int b;
    int a[100];
    char b,c;
    a = 5;
}
```

To the right, a terminal window titled "Student@prg21: ~/180905482/cd lab/lab 8" shows the command `./parse` being executed. The output is:

```
Student@prg21:~/180905482/cd lab/lab 8$ ./parse
~~~~~SUCCESS~~~~~
Student@prg21:~/180905482/cd lab/lab 8$
```

Case 2:-

```
main()
{
    int b;
    int a[100];
    char b,;
    a = 5;
}
```

The screenshot shows the same code editor with the same four tabs. The `parse.c` tab is active, displaying the following C code:

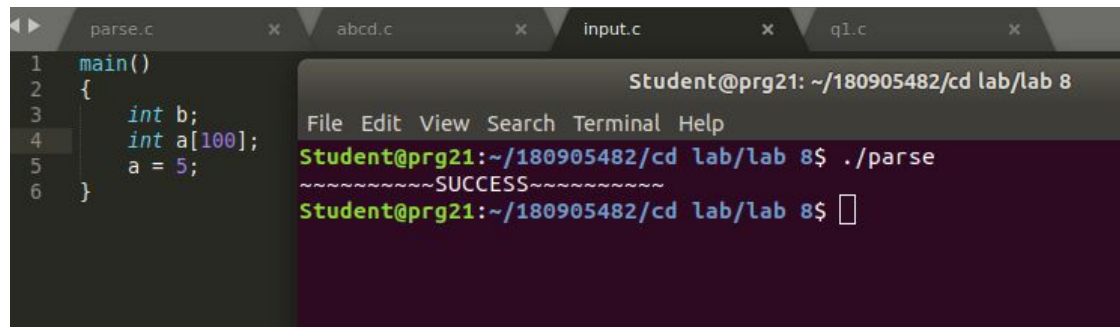
```
1 main()
2 {
3     int b;
4     int a[100];
5     char b,;
6     a = 5;
7 }
```

To the right, the terminal window shows the command `./parse` being executed. The output is:

```
Student@prg21:~/180905482/cd lab/lab 8$ ./parse
~~~~~INVALID~~~~~
Student@prg21:~/180905482/cd lab/lab 8$
```


Case 3:-

```
main()
{
    int b;
    int a[100];
    a = 5;
}
```



The screenshot shows a code editor with four tabs: 'parse.c', 'abcd.c', 'input.c', and 'q1.c'. The 'parse.c' tab is active, displaying the following C code:

```
1 main()
2 {
3     int b;
4     int a[100];
5     a = 5;
6 }
```

To the right of the code editor is a terminal window titled 'Student@prg21: ~/180905482/cd lab/lab 8'. The terminal has a menu bar with 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The terminal shows the following commands and output:

```
Student@prg21:~/180905482/cd lab/lab 8$ ./parse
~~~~~SUCCESS~~~~~
Student@prg21:~/180905482/cd lab/lab 8$
```