



System Programming Report

Assignment 3-2 – basic server

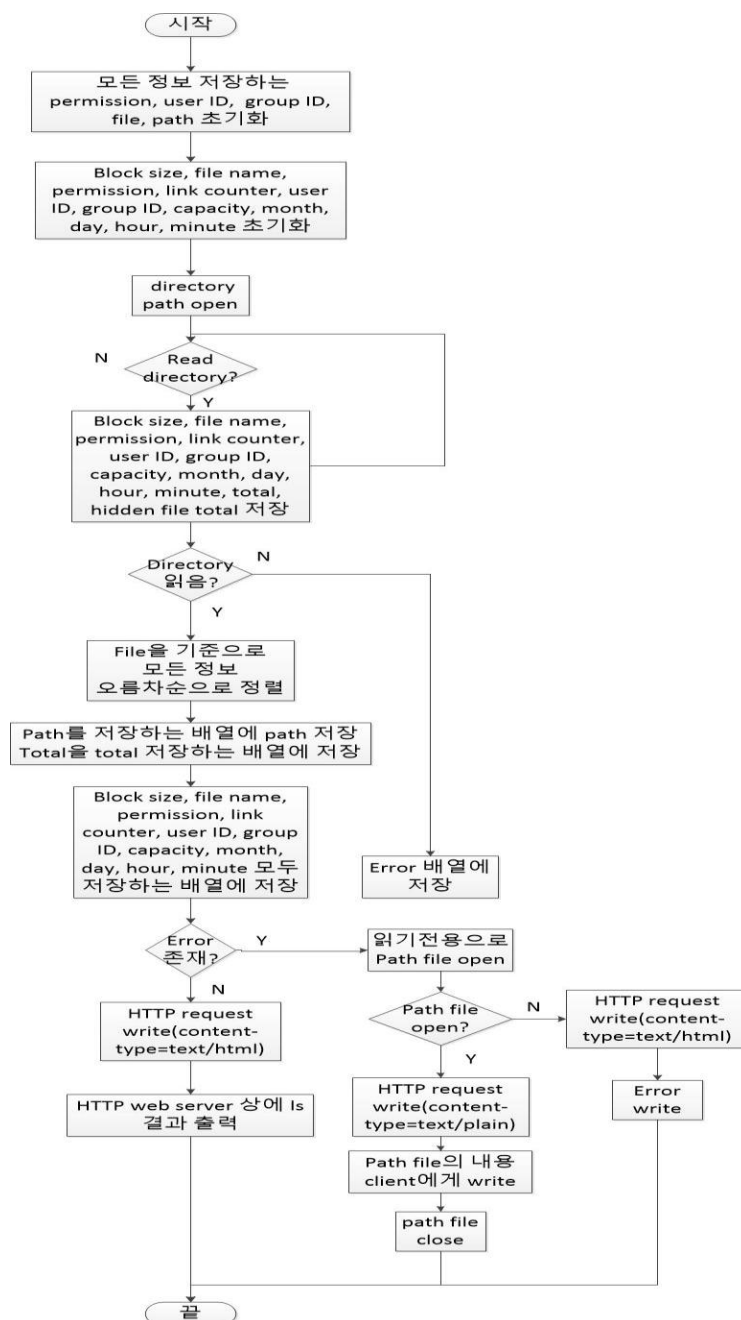
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◆ Introduction

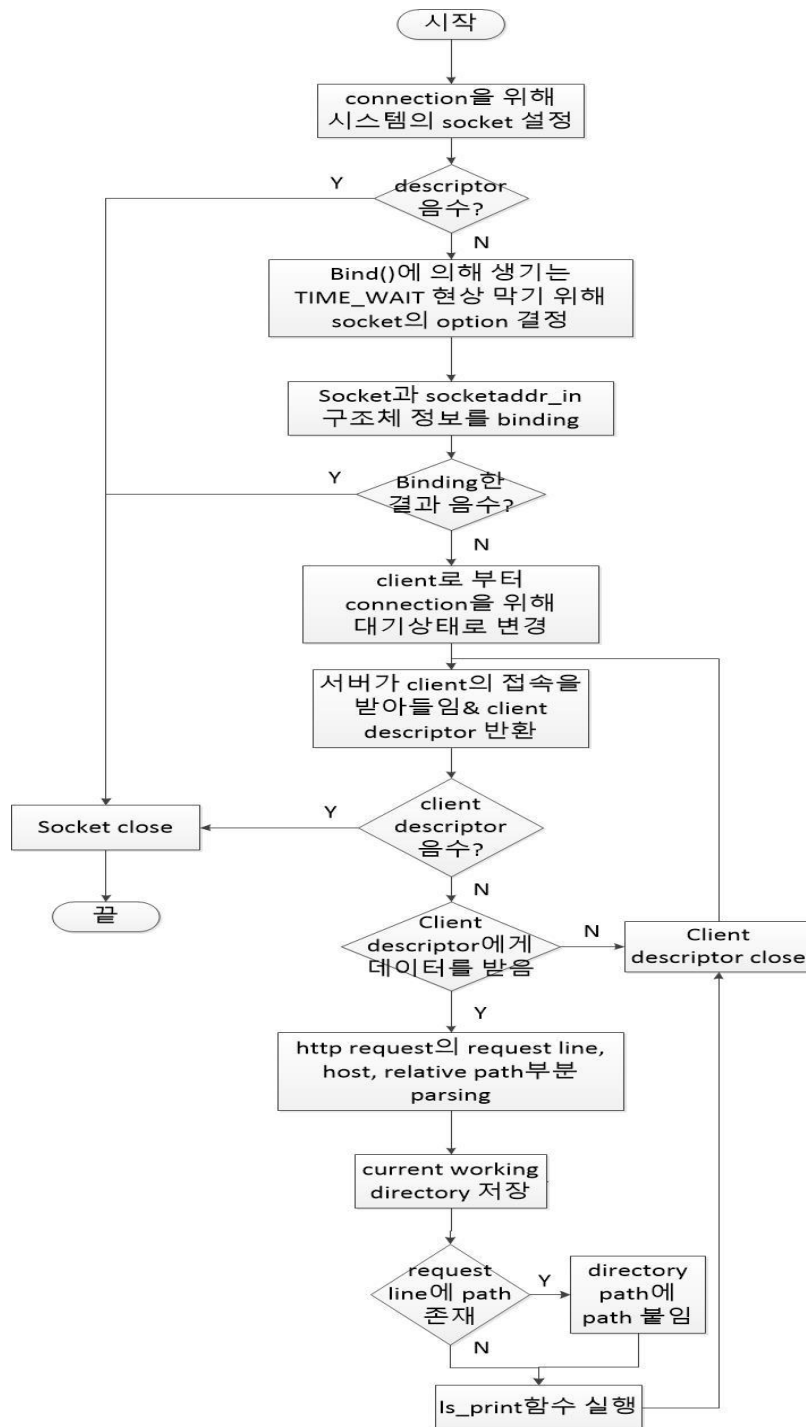
이번 과제는 HTML_Is의 결과를 다른 장치의 웹브라우저에서 볼 수 있도록 지원하는 server program을 구현하는 것이다. 모든 HTML_Is 결과는 ls -al한 결과로 출력된다. 브라우저로 사용자가 접속할 때 각자의 port number를 사용해서 접속하도록 한다. 처음 실행 위치는 current working directory path로 한다. 만약 <http://IP 주소:port number/temp>로 주어진다면 실행 위치는 current working directory path/temp로 한다.

◆ Flowchart

- ls_print 함수



- main 함수



◆ Pseudo code

- ls_print 함수

open directory


if directory can read

while(read information in opened directory){

```

        receive file name, permission, link counter, user ID, group ID, capacity, month,
        day, hour, minute, the number of 1K blocks, total
    }
}
if directory read
    for(k1=0;k1<index1;k1++){
        for(k2=0;k2<index1-1;k2++){
            receive two files' name
            if files' name are same
                continue for statement
            calculate files' length
            receive letters of files' name while two letter are different
            if first file's character > second file's character
                change file's position, permission's position, linkcounter's
                position, user ID's position, group ID's position, capacity's position, month's position, day's position,
                hour's position, minute's position, block's position
        }
    }
    save directory path and total
    save beginning information
    for(i=0;i<index1;i++,s_index++)
        save file, permission, user ID, group ID, block size, linkcounter, capacity, month,
        day, hour, minute
        save ending information
    }
if directory path doesn't exist

```



```
        save current path into error array

close directory

if error exists{

    path file open for read only

    if path file doesn't open{

        write HTTP response message at client descriptor(content type is text/html)

        write error message at client descriptor

    }

    if path file opens{

        write HTTP response message at client descriptor(content type is text/plain)

        read path file's content and write file's content at client descriptor

        close path file

    }

    end of function

}
```

```
write HTTP response message at client descriptor(content type is text/html)

write title and head at client descriptor

for(i=0;i<s_index;i++)

    write result of 'ls -al' at client descriptor
```

- main 함수

```
create a socket

if socket doesn't create{

    print "Server: Can't open stream socket."

    end of program

}

receive address family, IPv4 address, port number
```



use setsockopt function to block bind error

associate an address with a socket

if socket doesn't bind{

 print "Server: Can't bind local address.

 end of program

}

announce that server is willing to accept connect request

while(1){

 save client_address's size into len

 accept a connect request from client

 if it isn't accept{

 print "Server: accept failed.

 end of program

 }

 if it can read HTTP request message{

 initialize host, version, temp

 write HTTP request message

 find GET / HTTP/1.1 in HTTP request message

 find Host in HTTP request message

 find temp in HTTP request message

 if temp's last letter is '/'

 temp's last letter is NULL

 get current working directory path

 if exist relative path

 add relative path to current working directory path

 go to ls_print function

```
}  
  
close client descriptor  
  
}  
  
close socket descriptor
```

◆ Reference

이번 과제할 때 http request을 어디서 받는지 몰랐다. server code를 분석한 뒤에서야 read해 buf에 저장된다는 것을 알게 되었다. 이를 통해 header부분과 host부분을 parsing했다. 그 다음 client descriptor에 결과를 써줄 때 http response을 보내야 하는데 처음에는 보내는지 몰라 안 보냈더니 표가 출력되지 않았다. 강의자료를 보고 response을 보내야 된다는 것을 알게 되어 HTTP/1.1 200 OK, Content-Length, Content-Type을 client descriptor에 write해준 뒤 출력했더니 결과가 잘 나왔다. 파일을 하이퍼링크했을 때 파일의 내용을 보여주거나 다운로드 해야 되는데 하는 방식을 몰라 못했다. 그러다 조교님께 질문해 file을 open한 뒤 file의 내용을 client에게 보내줘야 된다는 것을 알게 되어 그렇게 했더니 잘 출력되고 다운로드 창이 떴다.