Network Architecture Project 1

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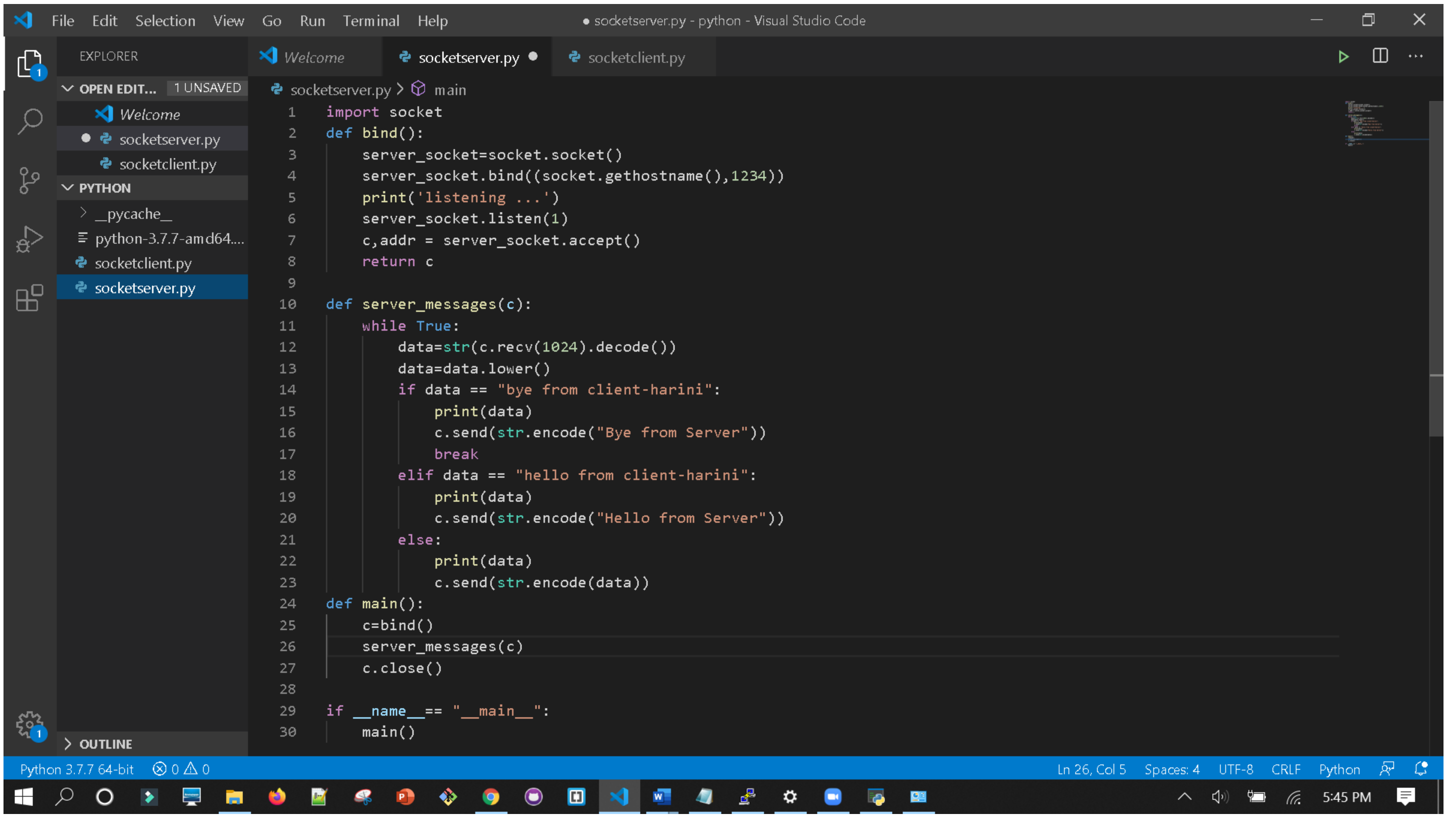
Part I. Socket programming - Develop simple TCP client and server programs locally, but test with another machine (eg: Another machine in UMKC network). Show the screenshots of simple message exchanges.

a) Start from client message 'Hello from Client-your names' and server responses with 'Hello from Server-your names'. Then messages from each side are echoed to each other. The program quit the program with typing 'Bye from Client-your name' and 'Bye from Server-your name'.

Server Code

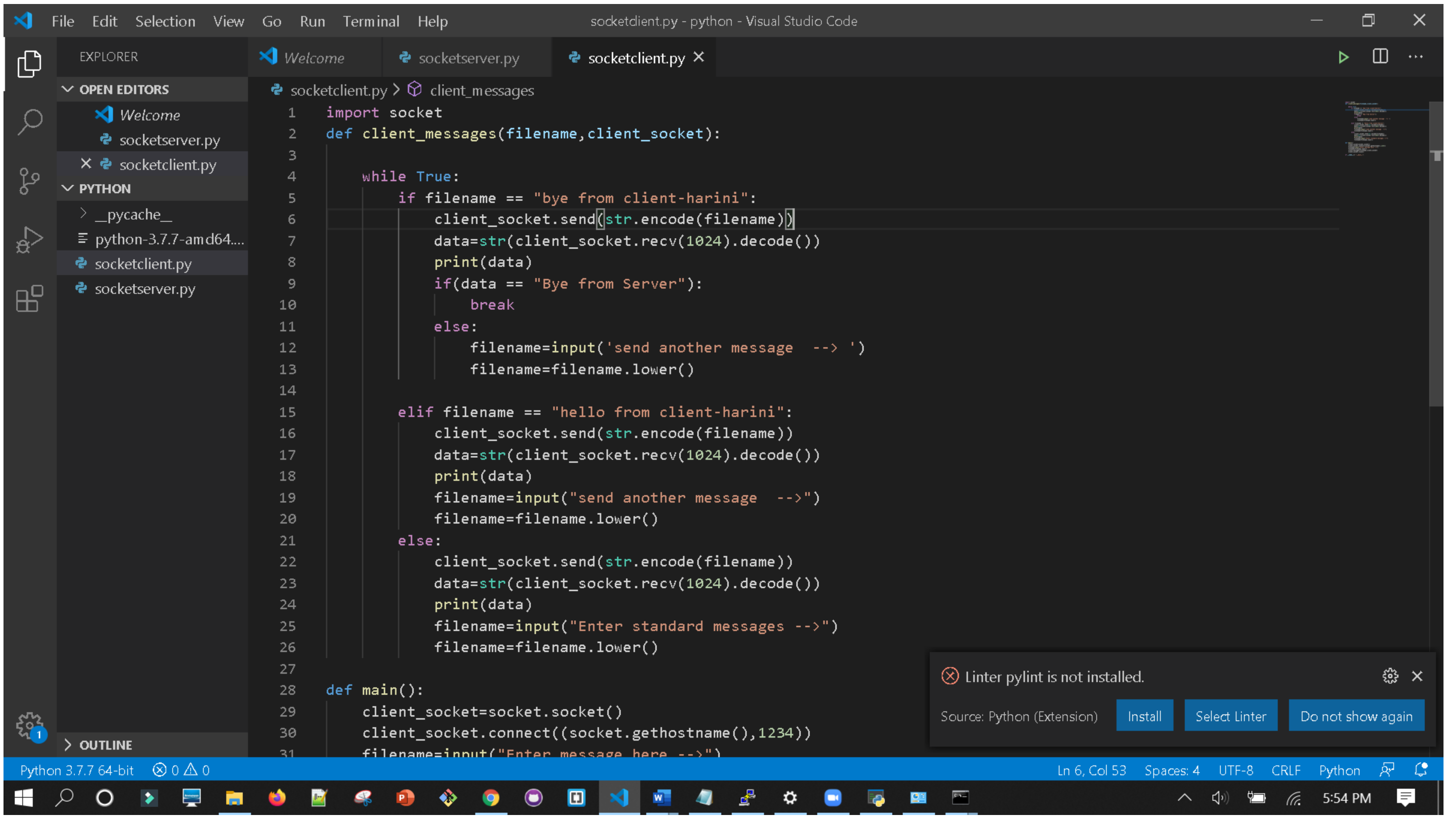
>> File name: socketserver.py



```python
import socket
def bind():
    server_socket=socket.socket()
    server_socket.bind((socket.gethostname(),1234))
    print('listening ...')
    server_socket.listen(1)
    c,addr = server_socket.accept()
    return c

def server_messages(c):
    while True:
        data=str(c.recv(1024).decode())
        data=data.lower()
        if data == "bye from client-harini":
            print(data)
            c.send(str.encode("Bye from Server"))
            break
        elif data == "hello from client-harini":
            print(data)
            c.send(str.encode("Hello from Server"))
        else:
            print(data)
            c.send(str.encode(data))
def main():
    c=bind()
    server_messages(c)
    c.close()

if __name__== "__main__":
    main()
```

Client code

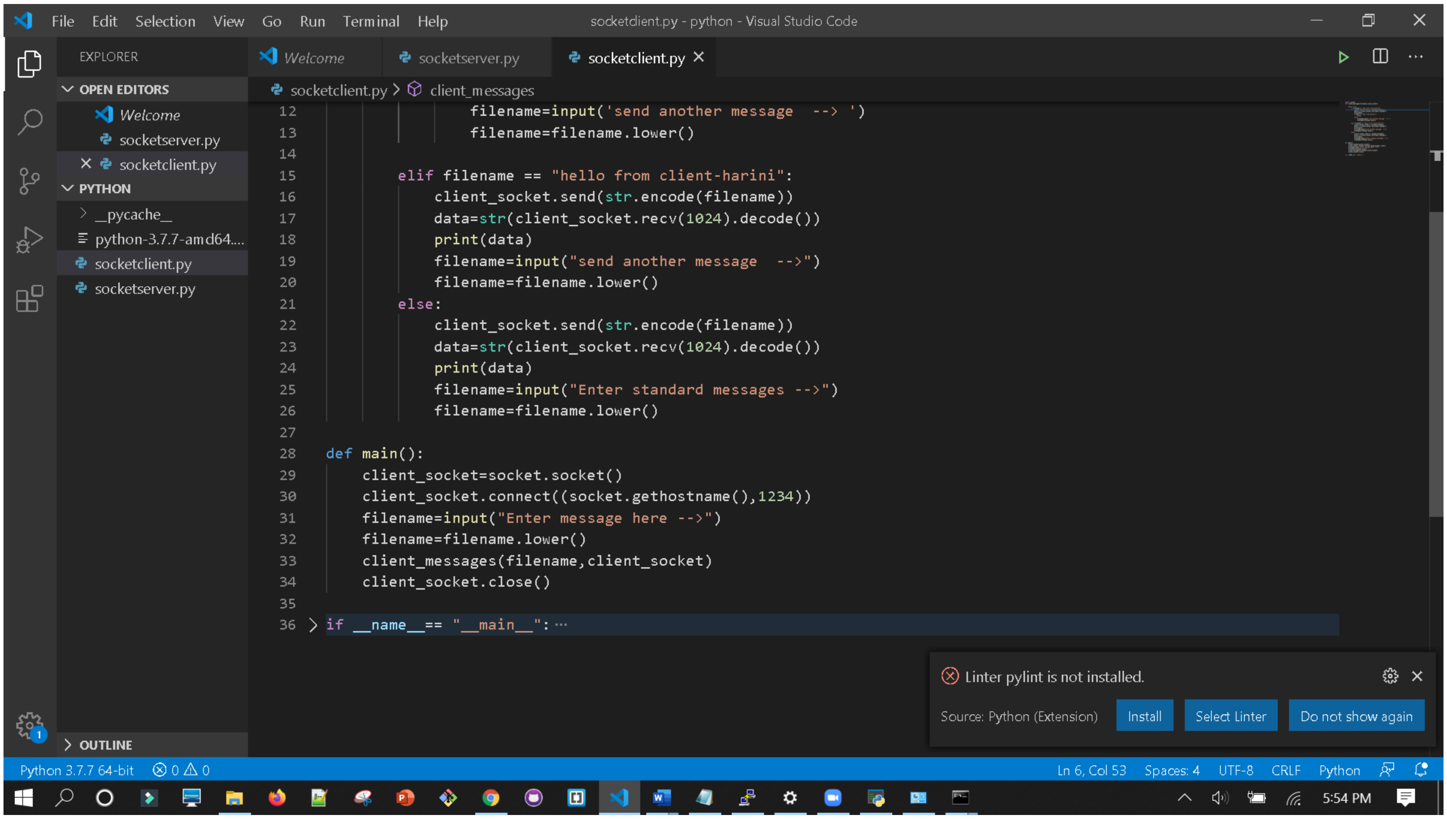
>>file name: socketclient.py



```python
import socket
def client_messages(filename,client_socket):

    while True:
        if filename == "bye from client-harini":
            client_socket.send(str.encode(filename))
            data=str(client_socket.recv(1024).decode())
            print(data)
            if(data == "Bye from Server"):
                break
            else:
                filename=input('send another message  --> ')
                filename=filename.lower()

        elif filename == "hello from client-harini":
            client_socket.send(str.encode(filename))
            data=str(client_socket.recv(1024).decode())
            print(data)
            filename=input("send another message  -->")
            filename=filename.lower()
        else:
            client_socket.send(str.encode(filename))
            data=str(client_socket.recv(1024).decode())
            print(data)
            filename=input("Enter standard messages -->")
            filename=filename.lower()

def main():
    client_socket=socket.socket()
    client_socket.connect((socket.gethostname(),1234))
    filename=input("Enter message here -->")
```

⊗ Linter pylint is not installed.

Source: Python (Extension) Install Select Linter Do not show again

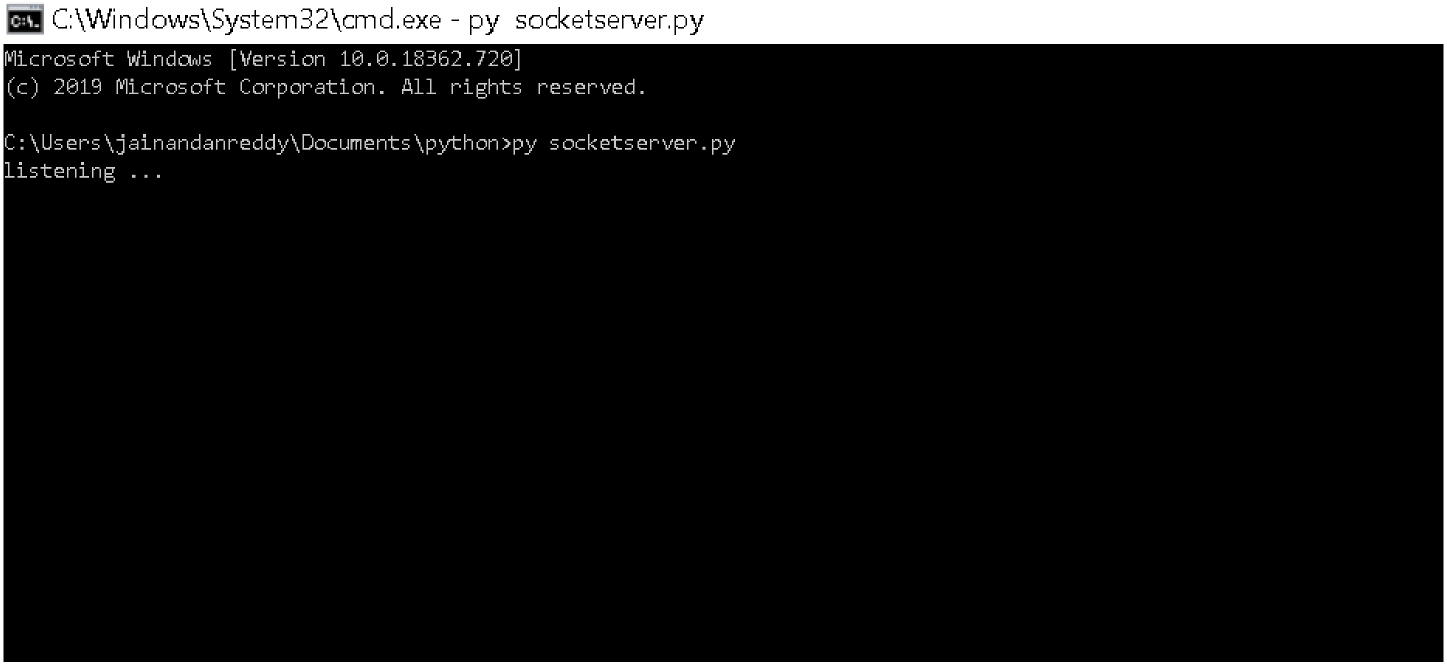


```python
                filename=input('send another message  --> ')
                filename=filename.lower()

        elif filename == "hello from client-harini":
            client_socket.send(str.encode(filename))
            data=str(client_socket.recv(1024).decode())
            print(data)
            filename=input("send another message  -->")
            filename=filename.lower()
        else:
            client_socket.send(str.encode(filename))
            data=str(client_socket.recv(1024).decode())
            print(data)
            filename=input("Enter standard messages -->")
            filename=filename.lower()

def main():
    client_socket=socket.socket()
    client_socket.connect((socket.gethostname(),1234))
    filename=input("Enter message here -->")
    filename=filename.lower()
    client_messages(filename,client_socket)
    client_socket.close()

> if __name__== "__main__":···
```

⊗ Linter pylint is not installed.

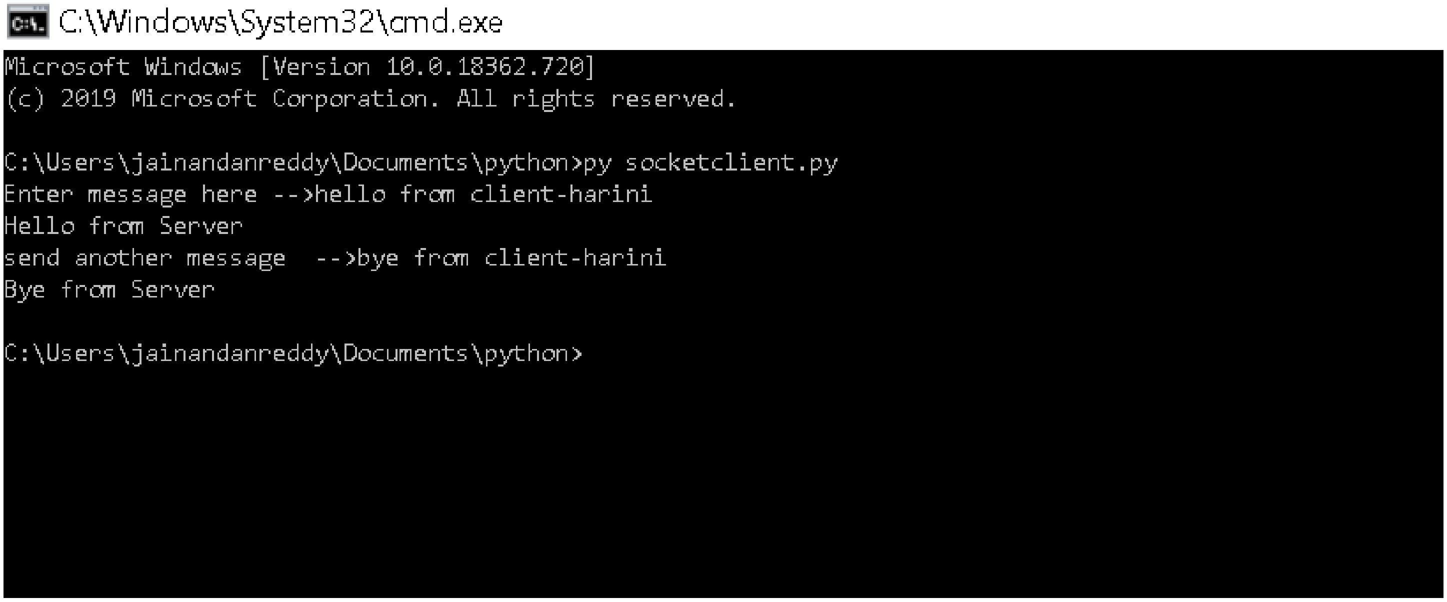
Source: Python (Extension) Install Select Linter Do not show again

First run the server code. This will put server in listening state



```
Microsoft Windows [Version 10.0.18362.720]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\jainandanreddy\Documents\python>py socketserver.py
listening ...
```

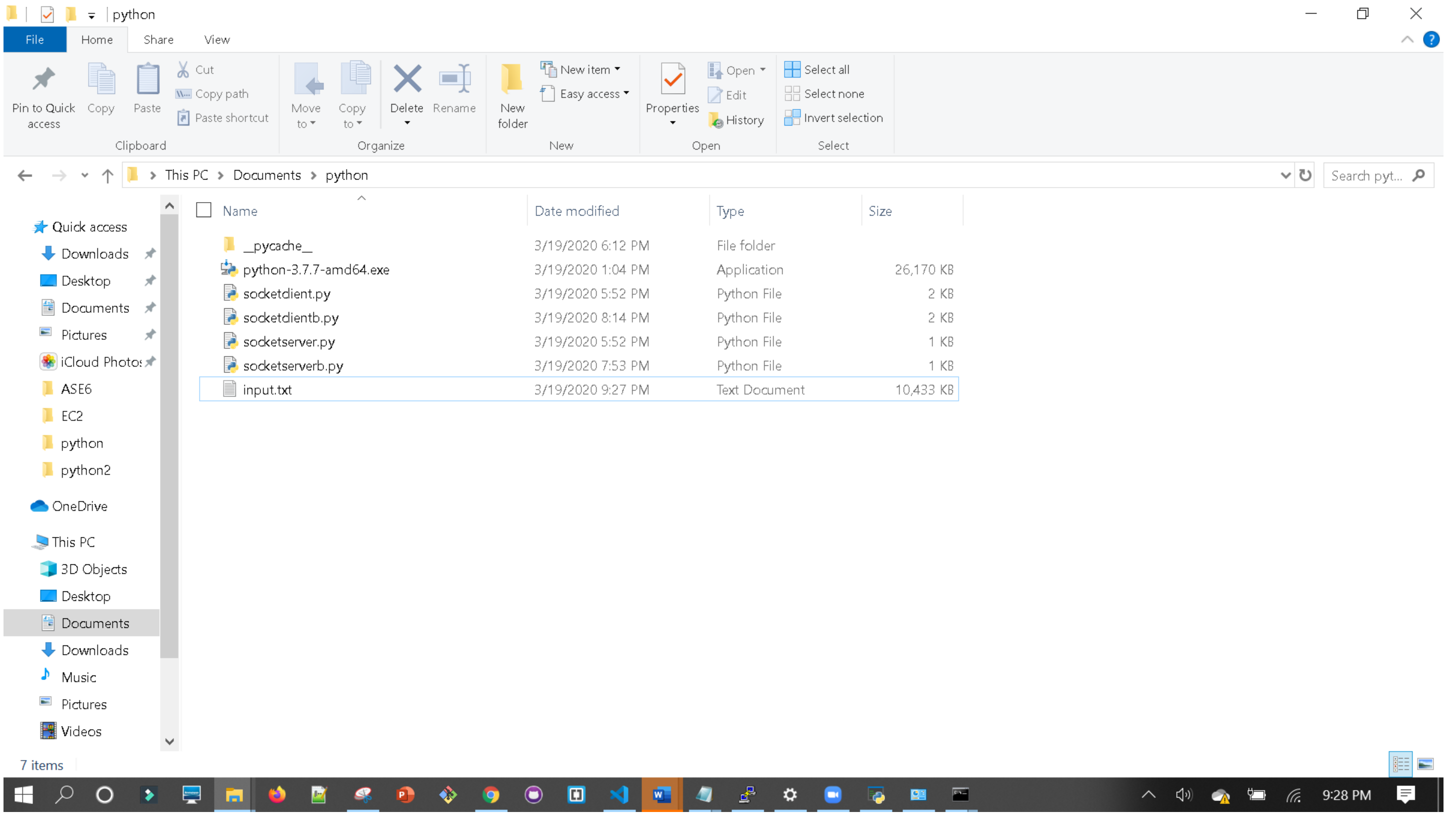
Now run the client code. We can see client-server communication here.



```
Microsoft Windows [Version 10.0.18362.720]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\jainandanreddy\Documents\python>py socketclient.py
Enter message here -->hello from client-harini
Hello from Server
send another message  -->bye from client-harini
Bye from Server

C:\Users\jainandanreddy\Documents\python>
```

b) A client sends a large text file (> 3 MB) to a server. (A small file transfer will receive only a partial credit Server prints the file on the screen, Server saves the file in a local system, Server appends one more line (eg. ‘This is an added line from a server) to the file. And send the updated file back to the client. Client shows the file on the screen after it fully receives the file. And display the newly added lines from the server, not the entire file content

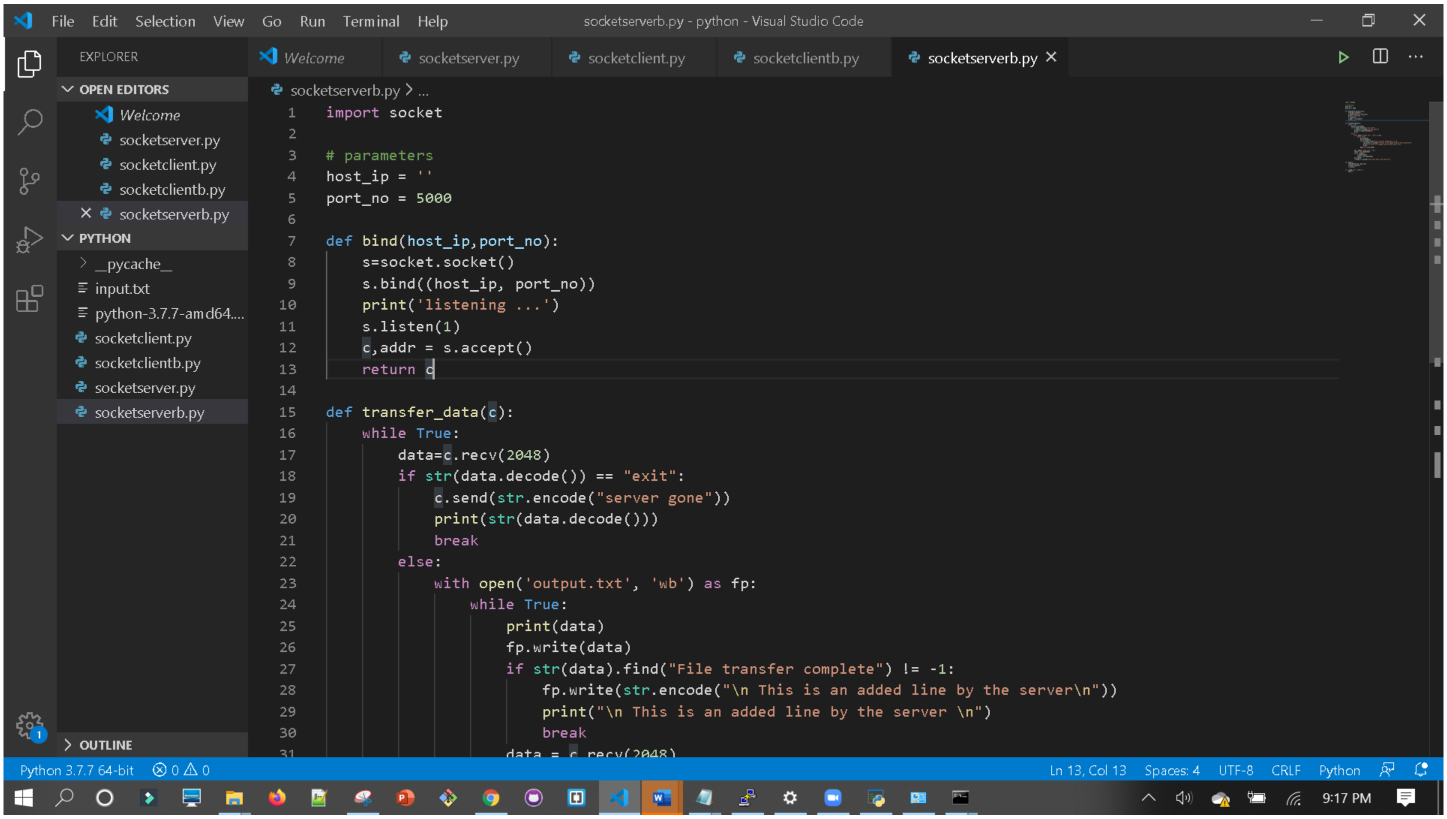
>>” **input.txt”** is the large text file which is 104333KB = 10.1 MB



Name	Date modified	Type	Size
__pycache__	3/19/2020 6:12 PM	File folder	
python-3.7.7-amd64.exe	3/19/2020 1:04 PM	Application	26,170 KB
socketclient.py	3/19/2020 5:52 PM	Python File	2 KB
socketclientb.py	3/19/2020 8:14 PM	Python File	2 KB
socketserver.py	3/19/2020 5:52 PM	Python File	1 KB
socketserverb.py	3/19/2020 7:53 PM	Python File	1 KB
input.txt	3/19/2020 9:27 PM	Text Document	10,433 KB

Server Code

>>File name socketserverb.py

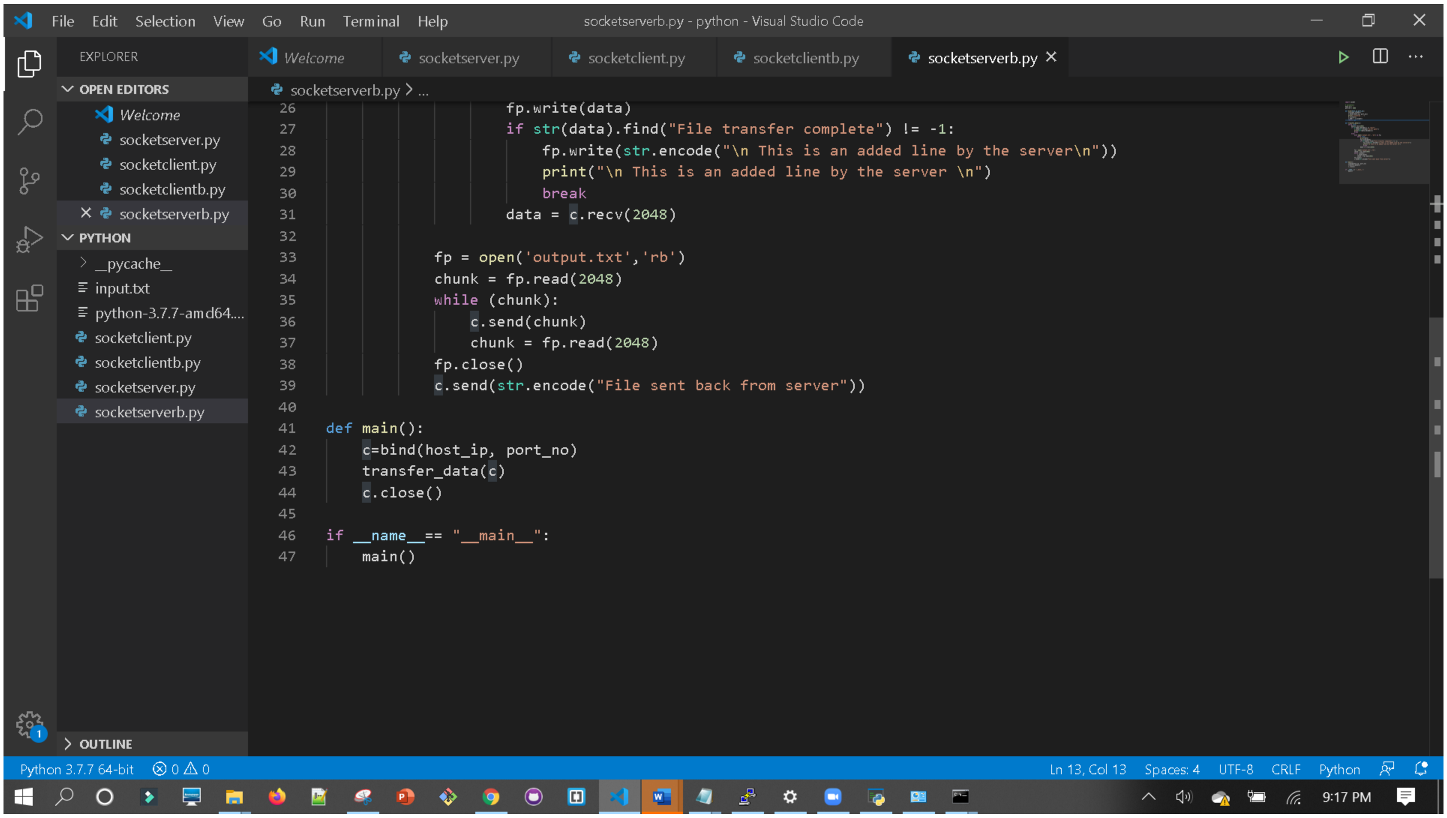


```python
import socket

# parameters
host_ip = ''
port_no = 5000

def bind(host_ip,port_no):
    s=socket.socket()
    s.bind((host_ip, port_no))
    print('listening ...')
    s.listen(1)
    c,addr = s.accept()
    return c

def transfer_data(c):
    while True:
        data=c.recv(2048)
        if str(data.decode()) == "exit":
            c.send(str.encode("server gone"))
            print(str(data.decode()))
            break
        else:
            with open('output.txt', 'wb') as fp:
                while True:
                    print(data)
                    fp.write(data)
                    if str(data).find("File transfer complete") != -1:
                        fp.write(str.encode("\n This is an added line by the server\n"))
                        print("\n This is an added line by the server \n")
                        break
                    data = c.recv(2048)
```



```
                    fp.write(data)
                    if str(data).find("File transfer complete") != -1:
                        fp.write(str.encode("\n This is an added line by the server\n"))
                        print("\n This is an added line by the server \n")
                        break
                    data = c.recv(2048)

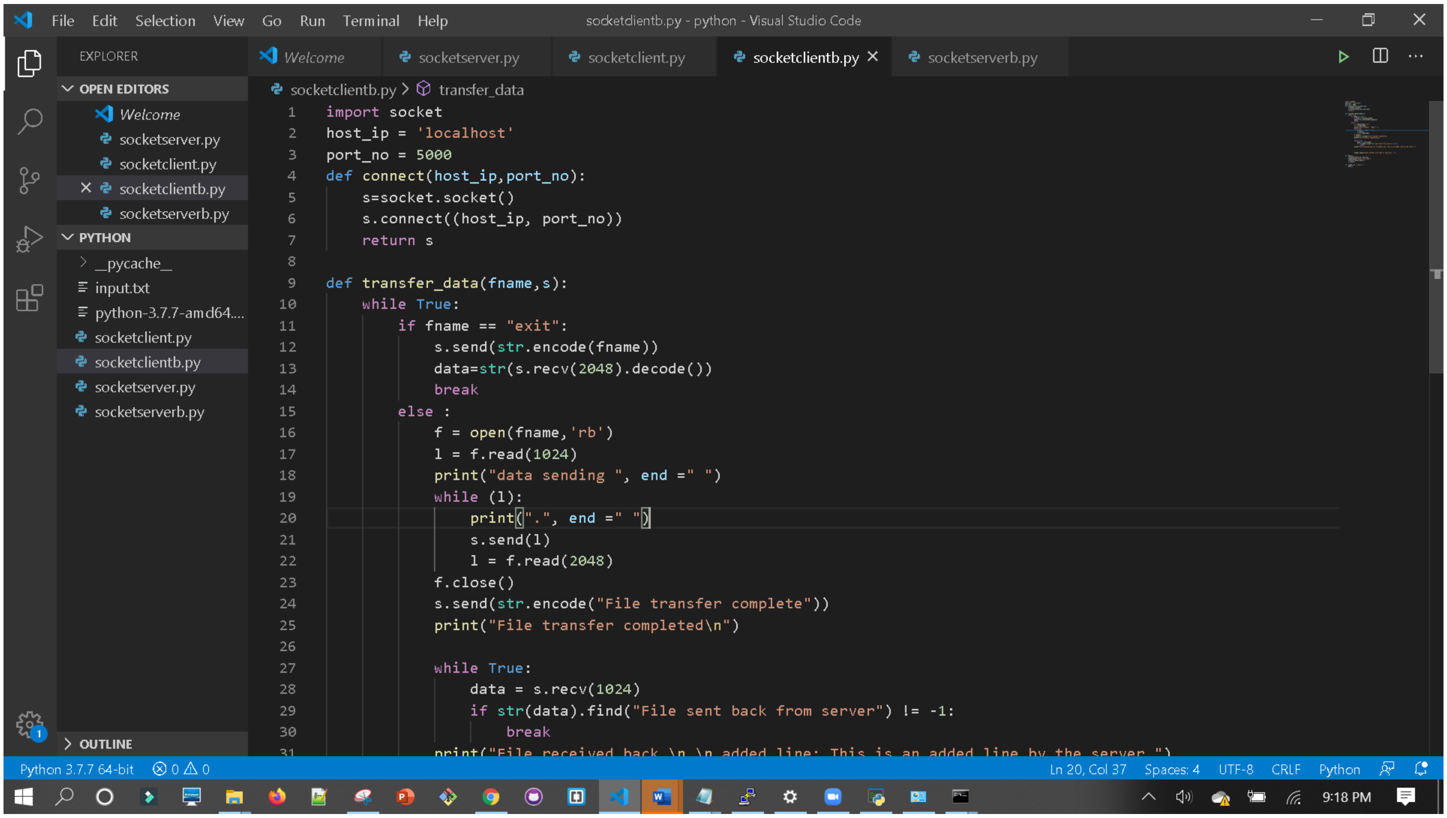
            fp = open('output.txt','rb')
            chunk = fp.read(2048)
            while (chunk):
                c.send(chunk)
                chunk = fp.read(2048)
            fp.close()
            c.send(str.encode("File sent back from server"))

def main():
    c=bind(host_ip, port_no)
    transfer_data(c)
    c.close()

if __name__== "__main__":
    main()
```

Client code

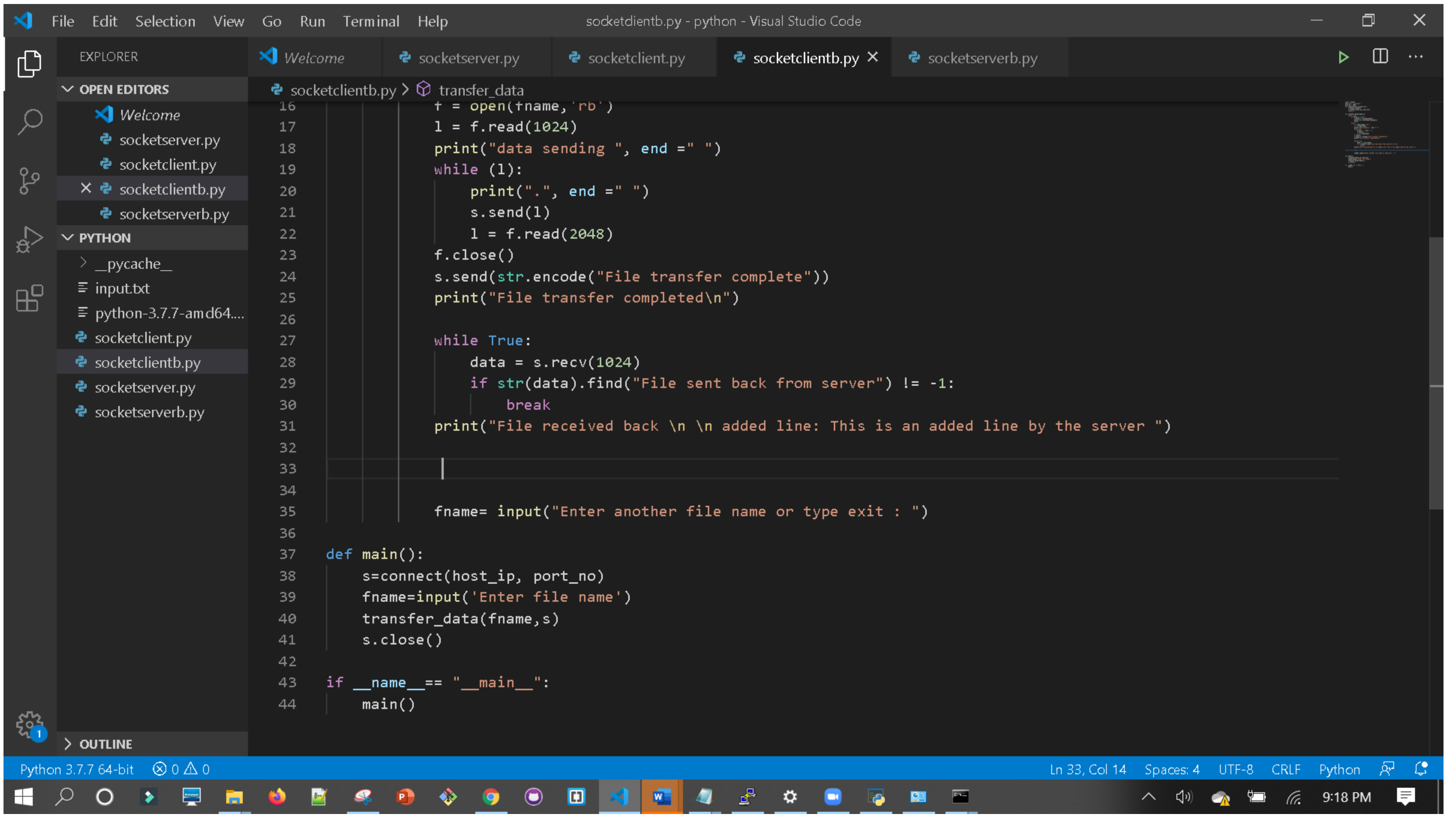
>>file name: socketclientb.py


File Edit Selection View Go Run Terminal Help
socketclientb.py - python - Visual Studio Code
EXPLORER
Welcome
socketserver.py
socketclient.py
socketclientb.py
socketserverb.py
OPEN EDITORS
PYTHON
pycache
input.txt
python-3.7.7-amd64....
OUTLINE
socketclientb.py > transfer_data
Python 3.7.7 64-bit ⊗ 0 ⚠ 0
Ln 20, Col 37 Spaces: 4 UTF-8 CRLF Python
9:18 PM

```
import socket
host_ip = 'localhost'
port_no = 5000
def connect(host_ip,port_no):
    s=socket.socket()
    s.connect((host_ip, port_no))
    return s

def transfer_data(fname,s):
    while True:
        if fname == "exit":
            s.send(str.encode(fname))
            data=str(s.recv(2048).decode())
            break
        else :
            f = open(fname,'rb')
            l = f.read(1024)
            print("data sending ", end =" ")
            while (l):
                print(".", end =" ")
                s.send(l)
                l = f.read(2048)
            f.close()
            s.send(str.encode("File transfer complete"))
            print("File transfer completed\n")

            while True:
                data = s.recv(1024)
                if str(data).find("File sent back from server") != -1:
                    break
            print("File received back \n \n added line: This is an added line by the server ")
```



```
            f = open(fname,'rb')
            l = f.read(1024)
            print("data sending ", end =" ")
            while (1):
                print(".", end =" ")
                s.send(l)
                l = f.read(2048)
            f.close()
            s.send(str.encode("File transfer complete"))
            print("File transfer completed\n")

            while True:
                data = s.recv(1024)
                if str(data).find("File sent back from server") != -1:
                    break
            print("File received back \n \n added line: This is an added line by the server ")

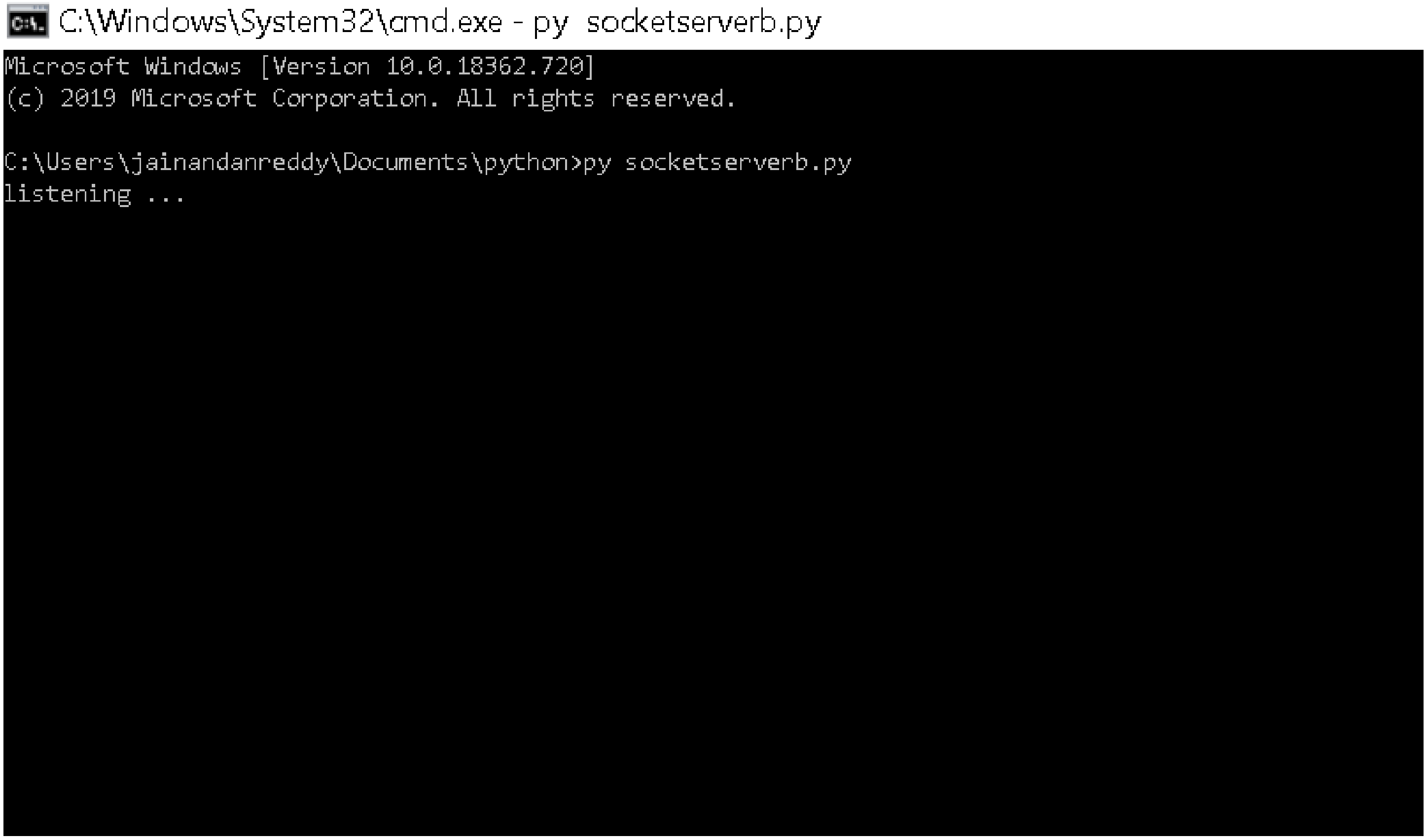


            fname= input("Enter another file name or type exit : ")

def main():
    s=connect(host_ip, port_no)
    fname=input('Enter file name')
    transfer_data(fname,s)
    s.close()

if __name__== "__main__":
    main()
```

>>First run the server code. This will put server in listening state



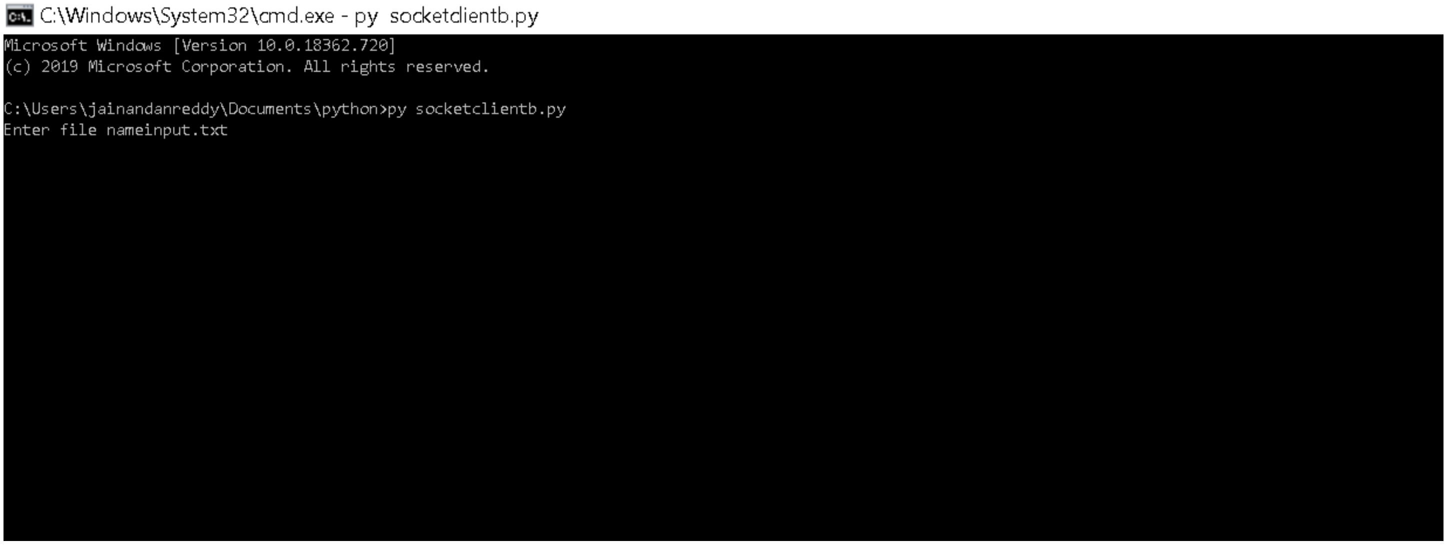
```
Microsoft Windows [Version 10.0.18362.720]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\jainandanreddy\Documents\python>py socketserverb.py
listening ...
```

>>Now run the client code

>>It will ask to enter the file name.

>>Provided file name as input.txt

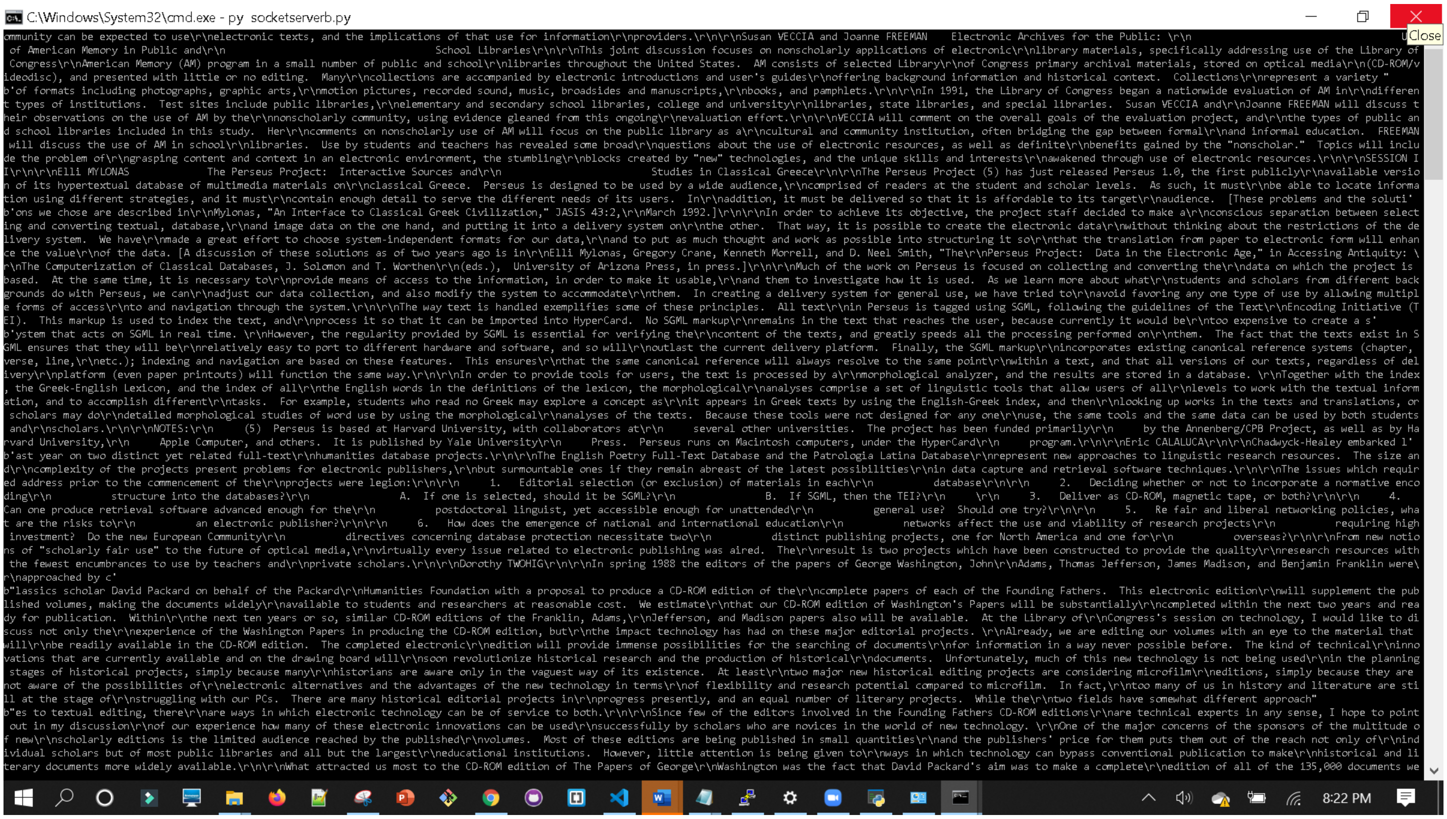


C:\Windows\System32\cmd.exe - py socketclientb.py

```
Microsoft Windows [Version 10.0.18362.720]
(c) 2019 Microsoft Corporation. All rights reserved.

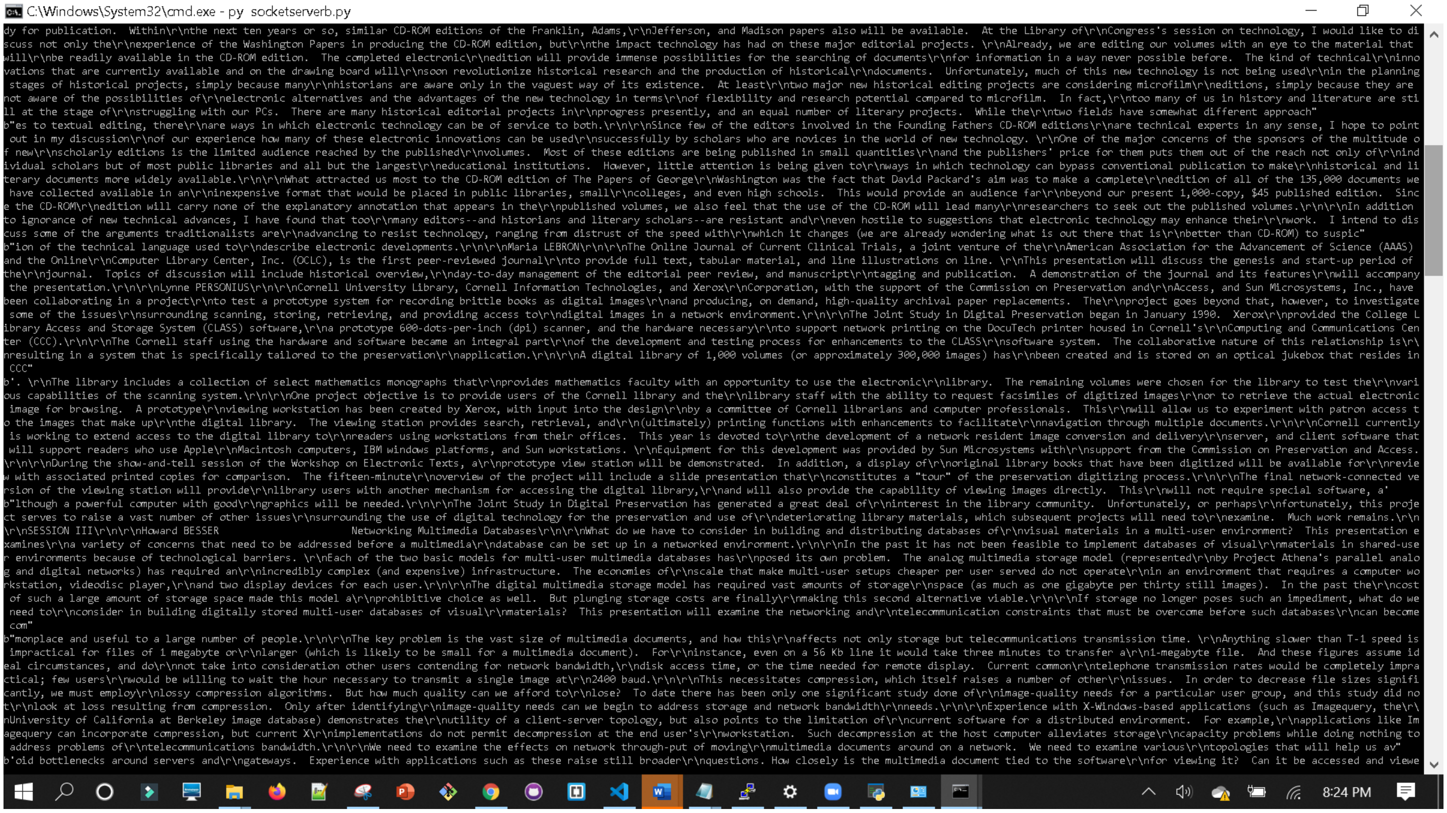
C:\Users\jainandanreddy\Documents\python>py socketclientb.py
Enter file nameinput.txt
```

>>Server prints the file on the screen



C:\Windows\System32\cmd.exe - py socketserverb.py

```
ommunity can be expected to use\r\nelectronic texts, and the implications of that use for information\r\nproviders.\r\n\r\nSusan VECCIA and Joanne FREEMAN    Electronic Archives for the Public: \r\n                              U
 of American Memory in Public and\r\n                                   School Libraries\r\n\r\nThis joint discussion focuses on nonscholarly applications of electronic\r\nlibrary materials, specifically addressing use of the Library of
 Congress\r\nAmerican Memory (AM) program in a small number of public and school\r\nlibraries throughout the United States.  AM consists of selected Library\r\nof Congress primary archival materials, stored on optical media\r\n(CD-ROM/v
ideodisc), and presented with little or no editing.  Many\r\ncollections are accompanied by electronic introductions and user's guides\r\noffering background information and historical context.  Collections\r\nrepresent a variety "
b'of formats including photographs, graphic arts,\r\nmotion pictures, recorded sound, music, broadsides and manuscripts,\r\nbooks, and pamphlets.\r\n\r\nIn 1991, the Library of Congress began a nationwide evaluation of AM in\r\ndifferen
t types of institutions.  Test sites include public libraries,\r\nelementary and secondary school libraries, college and university\r\nlibraries, state libraries, and special libraries.  Susan VECCIA and\r\nJoanne FREEMAN will discuss t
heir observations on the use of AM by the\r\nnonscholarly community, using evidence gleaned from this ongoing\r\nevaluation effort.\r\n\r\nVECCIA will comment on the overall goals of the evaluation project, and\r\nthe types of public an
d school libraries included in this study.  Her\r\ncomments on nonscholarly use of AM will focus on the public library as a\r\ncultural and community institution, often bridging the gap between formal\r\nand informal education.  FREEMAN
 will discuss the use of AM in school\r\nlibraries.  Use by students and teachers has revealed some broad\r\nquestions about the use of electronic resources, as well as definite\r\nbenefits gained by the "nonscholar."  Topics will inclu
de the problem of\r\ngrasping content and context in an electronic environment, the stumbling\r\nblocks created by "new" technologies, and the unique skills and interests\r\nawakened through use of electronic resources.\r\n\r\nSESSION I
I\r\n\r\nElli MYLONAS            The Perseus Project:  Interactive Sources and\r\n                              Studies in Classical Greece\r\n\r\nThe Perseus Project (5) has just released Perseus 1.0, the first publicly\r\navailable versio
n of its hypertextual database of multimedia materials on\r\nclassical Greece.  Perseus is designed to be used by a wide audience,\r\ncomprised of readers at the student and scholar levels.  As such, it must\r\nbe able to locate informa
tion using different strategies, and it must\r\ncontain enough detail to serve the different needs of its users.  In\r\naddition, it must be delivered so that it is affordable to its target\r\naudience.  [These problems and the soluti'
b'ons we chose are described in\r\nMylonas, "An Interface to Classical Greek Civilization," JASIS 43:2,\r\nMarch 1992.]\r\n\r\nIn order to achieve its objective, the project staff decided to make a\r\nconscious separation between select
ing and converting textual, database,\r\nand image data on the one hand, and putting it into a delivery system on\r\nthe other.  That way, it is possible to create the electronic data\r\nwithout thinking about the restrictions of the de
livery system.  We have\r\nmade a great effort to choose system-independent formats for our data,\r\nand to put as much thought and work as possible into structuring it so\r\nthat the translation from paper to electronic form will enhan
ce the value\r\nof the data. [A discussion of these solutions as of two years ago is in\r\nElli Mylonas, Gregory Crane, Kenneth Morrell, and D. Neel Smith, "The\r\nPerseus Project:  Data in the Electronic Age," in Accessing Antiquity: \
r\nThe Computerization of Classical Databases, J. Solomon and T. Worthen\r\n(eds.),  University of Arizona Press, in press.]\r\n\r\nMuch of the work on Perseus is focused on collecting and converting the\r\ndata on which the project is 
based.  At the same time, it is necessary to\r\nprovide means of access to the information, in order to make it usable,\r\nand them to investigate how it is used.  As we learn more about what\r\nstudents and scholars from different back
grounds do with Perseus, we can\r\nadjust our data collection, and also modify the system to accommodate\r\nthem.  In creating a delivery system for general use, we have tried to\r\navoid favoring any one type of use by allowing multipl
e forms of access\r\nto and navigation through the system.\r\n\r\nThe way text is handled exemplifies some of these principles.  All text\r\nin Perseus is tagged using SGML, following the guidelines of the Text\r\nEncoding Initiative (T
EI).  This markup is used to index the text, and\r\nprocess it so that it can be imported into HyperCard.  No SGML markup\r\nremains in the text that reaches the user, because currently it would be\r\ntoo expensive to create a s'
b'ystem that acts on SGML in real time. \r\nHowever, the regularity provided by SGML is essential for verifying the\r\ncontent of the texts, and greatly speeds all the processing performed on\r\nthem.  The fact that the texts exist in S
GML ensures that they will be\r\nrelatively easy to port to different hardware and software, and so will\r\noutlast the current delivery platform.  Finally, the SGML markup\r\nincorporates existing canonical reference systems (chapter,
verse, line,\r\netc.); indexing and navigation are based on these features.  This ensures\r\nthat the same canonical reference will always resolve to the same point\r\nwithin a text, and that all versions of our texts, regardless of del
ivery\r\nplatform (even paper printouts) will function the same way.\r\n\r\nIn order to provide tools for users, the text is processed by a\r\nmorphological analyzer, and the results are stored in a database. \r\nTogether with the index
, the Greek-English Lexicon, and the index of all\r\nthe English words in the definitions of the lexicon, the morphological\r\nanalyses comprise a set of linguistic tools that allow users of all\r\nlevels to work with the textual inform
ation, and to accomplish different\r\ntasks.  For example, students who read no Greek may explore a concept as\r\nit appears in Greek texts by using the English-Greek index, and then\r\nlooking up works in the texts and translations, or
 scholars may do\r\ndetailed morphological studies of word use by using the morphological\r\nanalyses of the texts.  Because these tools were not designed for any one\r\nuse, the same tools and the same data can be used by both students
 and\r\nscholars.\r\n\r\nNOTES:\r\n     (5)  Perseus is based at Harvard University, with collaborators at\r\n     several other universities.  The project has been funded primarily\r\n     by the Annenberg/CPB Project, as well as by Ha
rvard University,\r\n     Apple Computer, and others.  It is published by Yale University\r\n     Press.  Perseus runs on Macintosh computers, under the HyperCard\r\n     program.\r\n\r\nEric CALALUCA\r\n\r\nChadwyck-Healey embarked l'
b'ast year on two distinct yet related full-text\r\nhumanities database projects.\r\n\r\nThe English Poetry Full-Text Database and the Patrologia Latina Database\r\nrepresent new approaches to linguistic research resources.  The size an
d\r\ncomplexity of the projects present problems for electronic publishers,\r\nbut surmountable ones if they remain abreast of the latest possibilities\r\nin data capture and retrieval software techniques.\r\n\r\nThe issues which requir
ed address prior to the commencement of the\r\nprojects were legion:\r\n\r\n     1.   Editorial selection (or exclusion) of materials in each\r\n          database\r\n\r\n     2.   Deciding whether or not to incorporate a normative enco
ding\r\n          structure into the databases?\r\n               A.  If one is selected, should it be SGML?\r\n               B.  If SGML, then the TEI?\r\n     \r\n     3.   Deliver as CD-ROM, magnetic tape, or both?\r\n\r\n     4.   
Can one produce retrieval software advanced enough for the\r\n          postdoctoral linguist, yet accessible enough for unattended\r\n          general use?  Should one try?\r\n\r\n     5.   Re fair and liberal networking policies, wha
t are the risks to\r\n          an electronic publisher?\r\n\r\n     6.   How does the emergence of national and international education\r\n          networks affect the use and viability of research projects\r\n          requiring high
 investment?  Do the new European Community\r\n          directives concerning database protection necessitate two\r\n          distinct publishing projects, one for North America and one for\r\n          overseas?\r\n\r\nFrom new notio
ns of "scholarly fair use" to the future of optical media,\r\nvirtually every issue related to electronic publishing was aired.  The\r\nresult is two projects which have been constructed to provide the quality\r\nresearch resources with
 the fewest encumbrances to use by teachers and\r\nprivate scholars.\r\n\r\nDorothy TWOHIG\r\n\r\nIn spring 1988 the editors of the papers of George Washington, John\r\nAdams, Thomas Jefferson, James Madison, and Benjamin Franklin were\
r\napproached by c'
b"lassics scholar David Packard on behalf of the Packard\r\nHumanities Foundation with a proposal to produce a CD-ROM edition of the\r\ncomplete papers of each of the Founding Fathers.  This electronic edition\r\nwill supplement the pub
lished volumes, making the documents widely\r\navailable to students and researchers at reasonable cost.  We estimate\r\nthat our CD-ROM edition of Washington's Papers will be substantially\r\ncompleted within the next two years and rea
dy for publication.  Within\r\nthe next ten years or so, similar CD-ROM editions of the Franklin, Adams,\r\nJefferson, and Madison papers also will be available.  At the Library of\r\nCongress's session on technology, I would like to di
scuss not only the\r\nexperience of the Washington Papers in producing the CD-ROM edition, but\r\nthe impact technology has had on these major editorial projects. \r\nAlready, we are editing our volumes with an eye to the material that
will\r\nbe readily available in the CD-ROM edition.  The completed electronic\r\nedition will provide immense possibilities for the searching of documents\r\nfor information in a way never possible before.  The kind of technical\r\ninno
vations that are currently available and on the drawing board will\r\nsoon revolutionize historical research and the production of historical\r\ndocuments.  Unfortunately, much of this new technology is not being used\r\nin the planning
 stages of historical projects, simply because many\r\nhistorians are aware only in the vaguest way of its existence.  At least\r\ntwo major new historical editing projects are considering microfilm\r\neditions, simply because they are
not aware of the possibilities of\r\nelectronic alternatives and the advantages of the new technology in terms\r\nof flexibility and research potential compared to microfilm.  In fact,\r\ntoo many of us in history and literature are sti
ll at the stage of\r\nstruggling with our PCs.  There are many historical editorial projects in\r\nprogress presently, and an equal number of literary projects.  While the\r\ntwo fields have somewhat different approach"
b"es to textual editing, there\r\nare ways in which electronic technology can be of service to both.\r\n\r\nSince few of the editors involved in the Founding Fathers CD-ROM editions\r\nare technical experts in any sense, I hope to point
 out in my discussion\r\nof our experience how many of these electronic innovations can be used\r\nsuccessfully by scholars who are novices in the world of new technology. \r\nOne of the major concerns of the sponsors of the multitude o
f new\r\nscholarly editions is the limited audience reached by the published\r\nvolumes.  Most of these editions are being published in small quantities\r\nand the publishers' price for them puts them out of the reach not only of\r\nind
ividual scholars but of most public libraries and all but the largest\r\neducational institutions.  However, little attention is being given to\r\nways in which technology can bypass conventional publication to make\r\nhistorical and li
terary documents more widely available.\r\n\r\nWhat attracted us most to the CD-ROM edition of The Papers of George\r\nWashington was the fact that David Packard's aim was to make a complete\r\nedition of all of the 135,000 documents we
```



C:\Windows\System32\cmd.exe - py socketserverb.py

```
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will\r\nbe readily available in the CD-ROM edition.  The completed electronic\r\nedition will provide immense possibilities for the searching of documents\r\nfor information in a way never possible before.  The kind of technical\r\ninno
vations that are currently available and on the drawing board will\r\nsoon revolutionize historical research and the production of historical\r\ndocuments.  Unfortunately, much of this new technology is not being used\r\nin the planning
 stages of historical projects, simply because many\r\nhistorians are aware only in the vaguest way of its existence.  At least\r\ntwo major new historical editing projects are considering microfilm\r\neditions, simply because they are
not aware of the possibilities of\r\nelectronic alternatives and the advantages of the new technology in terms\r\nof flexibility and research potential compared to microfilm.  In fact,\r\ntoo many of us in history and literature are sti
ll at the stage of\r\nstruggling with our PCs.  There are many historical editorial projects in\r\nprogress presently, and an equal number of literary projects.  While the\r\ntwo fields have somewhat different approach"
b"es to textual editing, there\r\nare ways in which electronic technology can be of service to both.\r\n\r\n\r\nSince few of the editors involved in the Founding Fathers CD-ROM editions\r\nare technical experts in any sense, I hope to point
 out in my discussion\r\nof our experience how many of these electronic innovations can be used\r\nsuccessfully by scholars who are novices in the world of new technology. \r\nOne of the major concerns of the sponsors of the multitude o
f new\r\nscholarly editions is the limited audience reached by the published\r\nvolumes.  Most of these editions are being published in small quantities\r\nand the publishers' price for them puts them out of the reach not only of\r\nind
ividual scholars but of most public libraries and all but the largest\r\neducational institutions.  However, little attention is being given to\r\nways in which technology can bypass conventional publication to make\r\nhistorical and li
terary documents more widely available.\r\n\r\n\r\nWhat attracted us most to the CD-ROM edition of The Papers of George\r\nWashington was the fact that David Packard's aim was to make a complete\r\nedition of all of the 135,000 documents we
 have collected available in an\r\ninexpensive format that would be placed in public libraries, small\r\ncolleges, and even high schools.  This would provide an audience far\r\nbeyond our present 1,000-copy, $45 published edition.  Sinc
e the CD-ROM\r\nedition will carry none of the explanatory annotation that appears in the\r\npublished volumes, we also feel that the use of the CD-ROM will lead many\r\nresearchers to seek out the published volumes.\r\n\r\n\r\nIn addition
to ignorance of new technical advances, I have found that too\r\nmany editors--and historians and literary scholars--are resistant and\r\neven hostile to suggestions that electronic technology may enhance their\r\nwork.  I intend to dis
cuss some of the arguments traditionalists are\r\nadvancing to resist technology, ranging from distrust of the speed with\r\nwhich it changes (we are already wondering what is out there that is\r\nbetter than CD-ROM) to suspic"
b"ion of the technical language used to\r\ndescribe electronic developments.\r\n\r\n\r\nMaria LEBRON\r\n\r\n\r\nThe Online Journal of Current Clinical Trials, a joint venture of the\r\nAmerican Association for the Advancement of Science (AAAS)
and the Online\r\nComputer Library Center, Inc. (OCLC), is the first peer-reviewed journal\r\nto provide full text, tabular material, and line illustrations on line. \r\nThis presentation will discuss the genesis and start-up period of
the\r\njournal.  Topics of discussion will include historical overview,\r\nday-to-day management of the editorial peer review, and manuscript\r\ntagging and publication.  A demonstration of the journal and its features\r\nwill accompany
 the presentation.\r\n\r\n\r\nLynne PERSONIUS\r\n\r\n\r\nCornell University Library, Cornell Information Technologies, and Xerox\r\nCorporation, with the support of the Commission on Preservation and\r\nAccess, and Sun Microsystems, Inc., have
been collaborating in a project\r\nto test a prototype system for recording brittle books as digital images\r\nand producing, on demand, high-quality archival paper replacements.  The\r\nproject goes beyond that, however, to investigate
 some of the issues\r\nsurrounding scanning, storing, retrieving, and providing access to\r\ndigital images in a network environment.\r\n\r\n\r\nThe Joint Study in Digital Preservation began in January 1990.  Xerox\r\nprovided the College L
ibrary Access and Storage System (CLASS) software,\r\na prototype 600-dots-per-inch (dpi) scanner, and the hardware necessary\r\nto support network printing on the DocuTech printer housed in Cornell's\r\nComputing and Communications Cen
ter (CCC).\r\n\r\n\r\nThe Cornell staff using the hardware and software became an integral part\r\nof the development and testing process for enhancements to the CLASS\r\nsoftware system.  The collaborative nature of this relationship is\r\
nresulting in a system that is specifically tailored to the preservation\r\napplication.\r\n\r\n\r\nA digital library of 1,000 volumes (or approximately 300,000 images) has\r\nbeen created and is stored on an optical jukebox that resides in
 CCC"
b'. \r\nThe library includes a collection of select mathematics monographs that\r\nprovides mathematics faculty with an opportunity to use the electronic\r\nlibrary.  The remaining volumes were chosen for the library to test the\r\nvari
ous capabilities of the scanning system.\r\n\r\n\r\nOne project objective is to provide users of the Cornell library and the\r\nlibrary staff with the ability to request facsimiles of digitized images\r\nor to retrieve the actual electronic
 image for browsing.  A prototype\r\nviewing workstation has been created by Xerox, with input into the design\r\nby a committee of Cornell librarians and computer professionals.  This\r\nwill allow us to experiment with patron access t
o the images that make up\r\nthe digital library.  The viewing station provides search, retrieval, and\r\n(ultimately) printing functions with enhancements to facilitate\r\nnavigation through multiple documents.\r\n\r\n\r\nCornell currently
 is working to extend access to the digital library to\r\nreaders using workstations from their offices.  This year is devoted to\r\nthe development of a network resident image conversion and delivery\r\nserver, and client software that
 will support readers who use Apple\r\nMacintosh computers, IBM windows platforms, and Sun workstations. \r\nEquipment for this development was provided by Sun Microsystems with\r\nsupport from the Commission on Preservation and Access.
\r\n\r\n\r\nDuring the show-and-tell session of the Workshop on Electronic Texts, a\r\nprototype view station will be demonstrated.  In addition, a display of\r\noriginal library books that have been digitized will be available for\r\nrevie
w with associated printed copies for comparison.  The fifteen-minute\r\noverview of the project will include a slide presentation that\r\nconstitutes a "tour" of the preservation digitizing process.\r\n\r\n\r\nThe final network-connected ve
rsion of the viewing station will provide\r\nlibrary users with another mechanism for accessing the digital library,\r\nand will also provide the capability of viewing images directly.  This\r\nwill not require special software, a'
b"lthough a powerful computer with good\r\ngraphics will be needed.\r\n\r\n\r\nThe Joint Study in Digital Preservation has generated a great deal of\r\ninterest in the library community.  Unfortunately, or perhaps\r\nfortunately, this proje
ct serves to raise a vast number of other issues\r\nsurrounding the use of digital technology for the preservation and use of\r\ndeteriorating library materials, which subsequent projects will need to\r\nexamine.  Much work remains.\r\n
\r\nSESSION III\r\n\r\n\r\nHoward BESSER                    Networking Multimedia Databases\r\n\r\n\r\nWhat do we have to consider in building and distributing databases of\r\nvisual materials in a multi-user environment?  This presentation e
xamines\r\na variety of concerns that need to be addressed before a multimedia\r\ndatabase can be set up in a networked environment.\r\n\r\n\r\nIn the past it has not been feasible to implement databases of visual\r\nmaterials in shared-use
r environments because of technological barriers. \r\nEach of the two basic models for multi-user multimedia databases has\r\nposed its own problem.  The analog multimedia storage model (represented\r\nby Project Athena's parallel analo
g and digital networks) has required an\r\nincredibly complex (and expensive) infrastructure.  The economies of\r\nscale that make multi-user setups cheaper per user served do not operate\r\nin an environment that requires a computer wo
rkstation, videodisc player,\r\nand two display devices for each user.\r\n\r\n\r\nThe digital multimedia storage model has required vast amounts of storage\r\nspace (as much as one gigabyte per thirty still images).  In the past the\r\ncost
 of such a large amount of storage space made this model a\r\nprohibitive choice as well.  But plunging storage costs are finally\r\nmaking this second alternative viable.\r\n\r\n\r\nIf storage no longer poses such an impediment, what do we
 need to\r\nconsider in building digitally stored multi-user databases of visual\r\nmaterials?  This presentation will examine the networking and\r\ntelecommunication constraints that must be overcome before such databases\r\ncan become
 com"
b"monplace and useful to a large number of people.\r\n\r\n\r\nThe key problem is the vast size of multimedia documents, and how this\r\naffects not only storage but telecommunications transmission time. \r\nAnything slower than T-1 speed is
 impractical for files of 1 megabyte or\r\nlarger (which is likely to be small for a multimedia document).  For\r\ninstance, even on a 56 Kb line it would take three minutes to transfer a\r\n1-megabyte file.  And these figures assume id
eal circumstances, and do\r\nnot take into consideration other users contending for network bandwidth,\r\ndisk access time, or the time needed for remote display.  Current common\r\ntelephone transmission rates would be completely impra
ctical; few users\r\nwould be willing to wait the hour necessary to transmit a single image at\r\n2400 baud.\r\n\r\n\r\nThis necessitates compression, which itself raises a number of other\r\nissues.  In order to decrease file sizes signifi
cantly, we must employ\r\nlossy compression algorithms.  But how much quality can we afford to\r\nlose?  To date there has been only one significant study done of\r\nimage-quality needs for a particular user group, and this study did no
t\r\nlook at loss resulting from compression.  Only after identifying\r\nimage-quality needs can we begin to address storage and network bandwidth\r\nneeds.\r\n\r\n\r\nExperience with X-Windows-based applications (such as Imagequery, the\r\
nUniversity of California at Berkeley image database) demonstrates the\r\nutility of a client-server topology, but also points to the limitation of\r\ncurrent software for a distributed environment.  For example,\r\napplications like Im
agequery can incorporate compression, but current X\r\nimplementations do not permit decompression at the end user's\r\nworkstation.  Such decompression at the host computer alleviates storage\r\ncapacity problems while doing nothing to
 address problems of\r\ntelecommunications bandwidth.\r\n\r\n\r\nWe need to examine the effects on network through-put of moving\r\nmultimedia documents around on a network.  We need to examine various\r\ntopologies that will help us av"
b'oid bottlenecks around servers and\r\ngateways.  Experience with applications such as these raise still broader\r\nquestions. How closely is the multimedia document tied to the software\r\nfor viewing it?  Can it be accessed and viewe
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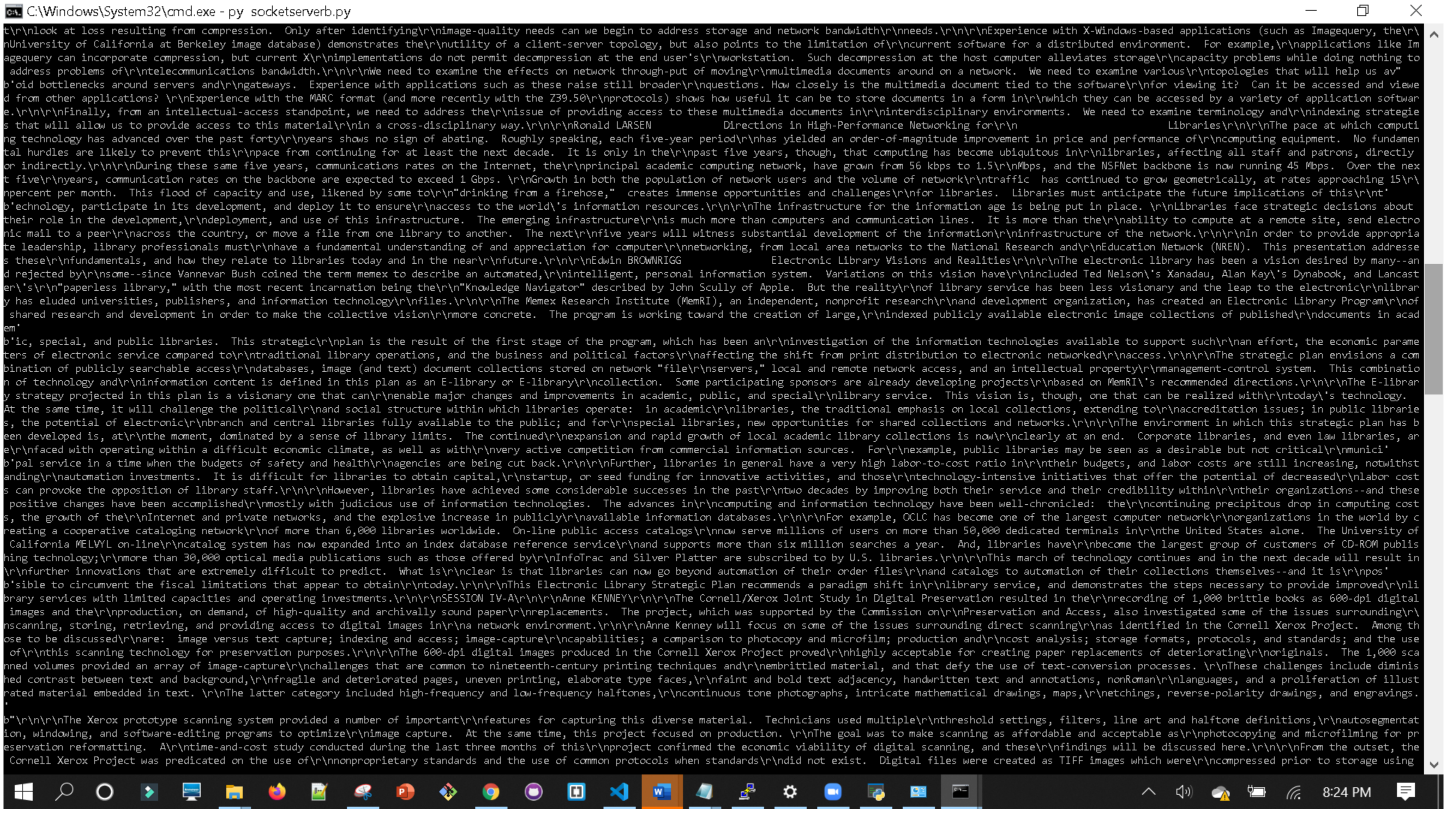

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b'oid bottlenecks around servers and\r\ngateways.  Experience with applications such as these raise still broader\r\nquestions. How closely is the multimedia document tied to the software\r\nfor viewing it?  Can it be accessed and viewe
d from other applications? \r\nExperience with the MARC format (and more recently with the Z39.50\r\nprotocols) shows how useful it can be to store documents in a form in\r\nwhich they can be accessed by a variety of application softwar
e.\r\n\r\n\r\nFinally, from an intellectual-access standpoint, we need to address the\r\nissue of providing access to these multimedia documents in\r\ninterdisciplinary environments.  We need to examine terminology and\r\nindexing strategie
s that will allow us to provide access to this material\r\nin a cross-disciplinary way.\r\n\r\n\r\nRonald LARSEN            Directions in High-Performance Networking for\r\n                                Libraries\r\n\r\n\r\nThe pace at which computi
ng technology has advanced over the past forty\r\nyears shows no sign of abating.  Roughly speaking, each five-year period\r\nhas yielded an order-of-magnitude improvement in price and performance of\r\ncomputing equipment.  No fundamen
tal hurdles are likely to prevent this\r\npace from continuing for at least the next decade.  It is only in the\r\npast five years, though, that computing has become ubiquitous in\r\nlibraries, affecting all staff and patrons, directly
or indirectly.\r\n\r\n\r\nDuring these same five years, communications rates on the Internet, the\r\nprincipal academic computing network, have grown from 56 kbps to 1.5\r\nMbps, and the NSFNet backbone is now running 45 Mbps.  Over the nex
t five\r\nyears, communication rates on the backbone are expected to exceed 1 Gbps. \r\nGrowth in both the population of network users and the volume of network\r\ntraffic  has continued to grow geometrically, at rates approaching 15\r\
npercent per month.  This flood of capacity and use, likened by some to\r\n"drinking from a firehose,"  creates immense opportunities and challenges\r\nfor libraries.  Libraries must anticipate the future implications of this\r\nt'
b'echnology, participate in its development, and deploy it to ensure\r\naccess to the world\'s information resources.\r\n\r\n\r\nThe infrastructure for the information age is being put in place. \r\nLibraries face strategic decisions about
their role in the development,\r\ndeployment, and use of this infrastructure.  The emerging infrastructure\r\nis much more than computers and communication lines.  It is more than the\r\nability to compute at a remote site, send electro
nic mail to a peer\r\nacross the country, or move a file from one library to another.  The next\r\nfive years will witness substantial development of the information\r\ninfrastructure of the network.\r\n\r\n\r\nIn order to provide appropria
te leadership, library professionals must\r\nhave a fundamental understanding of and appreciation for computer\r\nnetworking, from local area networks to the National Research and\r\nEducation Network (NREN).  This presentation addresse
s these\r\nfundamentals, and how they relate to libraries today and in the near\r\nfuture.\r\n\r\n\r\nEdwin BROWNRIGG           Electronic Library Visions and Realities\r\n\r\n\r\nThe electronic library has been a vision desired by many--an
d rejected by\r\nsome--since Vannevar Bush coined the term memex to describe an automated,\r\nintelligent, personal information system.  Variations on this vision have\r\nincluded Ted Nelson\'s Xanadau, Alan Kay\'s Dynabook, and Lancast
er\'s\r\n"paperless library," with the most recent incarnation being the\r\n"Knowledge Navigator" described by John Scully of Apple.  But the reality\r\nof library service has been less visionary and the leap to the electronic\r\nlibrar
y has eluded universities, publishers, and information technology\r\nfiles.\r\n\r\n\r\nThe Memex Research Institute (MemRI), an independent, nonprofit research\r\nand development organization, has created an Electronic Library Program\r\nof
 shared research and development in order to make the collective vision\r\nmore concrete.  The program is working toward the creation of large,\r\nindexed publicly available electronic image collections of published\r\ndocuments in acad
em'
b'ic, special, and public libraries.  This strategic\r\nplan is the result of the first stage of the program, which has been an\r\ninvestigation of the information technologies available to support such\r\nan effort, the economic parame
ters of electronic service compared to\r\ntraditional library operations, and the business and political factors\r\naffecting the shift from print distribution to electronic networked\r\naccess.\r\n\r\n\r\nThe strategic plan envisions a com
bination of publicly searchable access\r\ndatabases, image (and text) document collections stored on network "file\r\nservers," local and remote network access, and an intellectual property\r\nmanagement-control system.  This combinatio
n of technology and\r\ninformation content is defined in this plan as an E-library or E-library\r\ncollection.  Some participating sponsors are already developing projects\r\nbased on MemRI\'s recommended directions.\r\n\r\n\r\nThe E-librar
y strategy projected in this plan is a visionary one that can\r\nenable major changes and improvements in academic, public, and special\r\nlibrary service.  This vision is, though, one that can be realized with\r\ntoday\'s technology. 
At the same time, it will challenge the political\r\nand social structure within which libraries operate:  in academic\r\nlibraries, the traditional emphasis on local collections, extending to\r\naccreditation issues; in public librarie
s, the potential of electronic\r\nbranch and central libraries fully available to the public; and for\r\nspecial libraries, new opportunities for shared collections and networks.\r\n\r\n\r\nThe environment in which this strategic plan has b
een developed is, at\r\nthe moment, dominated by a sense of library limits.  The continued\r\nexpansion and rapid growth of local academic library collections is now\r\nclearly at an end.  Corporate libraries, and even law libraries, ar
e\r\nfaced with operating within a difficult economic climate, as well as with\r\nvery active competition from commercial information sources.  For\r\nexample, public libraries may be seen as a desirable but not critical\r\nmunici'
b'pal service in a time when the budgets of safety and health\r\nagencies are being cut back.\r\n\r\n\r\nFurther, libraries in general have a very high labor-to-cost ratio in\r\ntheir budgets, and labor costs are still increasing, notwithst
anding\r\nautomation investments.  It is difficult for libraries to obtain capital,\r\nstartup, or seed funding for innovative activities, and those\r\ntechnology-intensive initiatives that offer the potential of decreased\r\nlabor cost
s can provoke the opposition of library staff.\r\n\r\n\r\nHowever, libraries have achieved some considerable successes in the past\r\ntwo decades by improving both their service and their credibility within\r\ntheir organizations--and these
 positive changes have been accomplished\r\nmostly with judicious use of information technologies.  The advances in\r\ncomputing and information technology have been well-chronicled:  the\r\ncontinuing precipitous drop in computing cost
s, the growth of the\r\nInternet and private networks, and the explosive increase in publicly\r\navailable information databases.\r\n\r\n\r\nFor example, OCLC has become one of the largest computer network\r\norganizations in the world by c
reating a cooperative cataloging network\r\nof more than 6,000 libraries worldwide.  On-line public access catalogs\r\nnow serve millions of users on more than 50,000 dedicated terminals in\r\nthe United States alone.  The University of
 California MELVYL on-line\r\ncatalog system has now expanded into an index database reference service\r\nand supports more than six million searches a year.  And, libraries have\r\nbecome the largest group of customers of CD-ROM publis
hing technology;\r\nmore than 30,000 optical media publications such as those offered by\r\nInfoTrac and Silver Platter are subscribed to by U.S. libraries.\r\n\r\n\r\nThis march of technology continues and in the next decade will result in
\r\nfurther innovations that are extremely difficult to predict.  What is\r\nclear is that libraries can now go beyond automation of their order files\r\nand catalogs to automation of their collections themselves--and it is\r\npos'
b'sible to circumvent the fiscal limitations that appear to obtain\r\ntoday.\r\n\r\n\r\nThis Electronic Library Strategic Plan recommends a paradigm shift in\r\nlibrary service, and demonstrates the steps necessary to provide improved\r\nli
brary services with limited capacities and operating investments.\r\n\r\n\r\nSESSION IV-A\r\n\r\n\r\nAnne KENNEY\r\n\r\n\r\nThe Cornell/Xerox Joint Study in Digital Preservation resulted in the\r\nrecording of 1,000 brittle books as 600-dpi digital
 images and the\r\nproduction, on demand, of high-quality and archivally sound paper\r\nreplacements.  The project, which was supported by the Commission on\r\nPreservation and Access, also investigated some of the issues surrounding\r\
nscanning, storing, retrieving, and providing access to digital images in\r\na network environment.\r\n\r\n\r\nAnne Kenney will focus on some of the issues surrounding direct scanning\r\nas identified in the Cornell Xerox Project.  Among th
ose to be discussed\r\nare:  image versus text capture; indexing and access; image-capture\r\ncapabilities; a comparison to photocopy and microfilm; production and\r\ncost analysis; storage formats, protocols, and standards; and the use
 of\r\nthis scanning technology for preservation purposes.\r\n\r\n\r\nThe 600-dpi digital images produced in the Cornell Xerox Project proved\r\nhighly acceptable for creating paper replacements of deteriorating\r\noriginals.  The 1,000 sca
nned volumes provided an array of image-capture\r\nchallenges that are common to nineteenth-century printing techniques and\r\nembrittled material, and that defy the use of text-conversion processes. \r\nThese challenges include diminis
hed contrast between text and background,\r\nfragile and deteriorated pages, uneven printing, elaborate type faces,\r\nfaint and bold text adjacency, handwritten text and annotations, nonRoman\r\nlanguages, and a proliferation of illust
rated material embedded in text. \r\nThe latter category included high-frequency and low-frequency halftones,\r\ncontinuous tone photographs, intricate mathematical drawings, maps,\r\netchings, reverse-polarity drawings, and engravings.
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b"\r\n\r\n\r\nThe Xerox prototype scanning system provided a number of important\r\nfeatures for capturing this diverse material.  Technicians used multiple\r\nthreshold settings, filters, line art and halftone definitions,\r\nautosegmentat
ion, windowing, and software-editing programs to optimize\r\nimage capture.  At the same time, this project focused on production. \r\nThe goal was to make scanning as affordable and acceptable as\r\nphotocopying and microfilming for pr
eservation reformatting.  A\r\ntime-and-cost study conducted during the last three months of this\r\nproject confirmed the economic viability of digital scanning, and these\r\nfindings will be discussed here.\r\n\r\n\r\nFrom the outset, the
 Cornell Xerox Project was predicated on the use of\r\nnonproprietary standards and the use of common protocols when standards\r\ndid not exist.  Digital files were created as TIFF images which were\r\ncompressed prior to storage using
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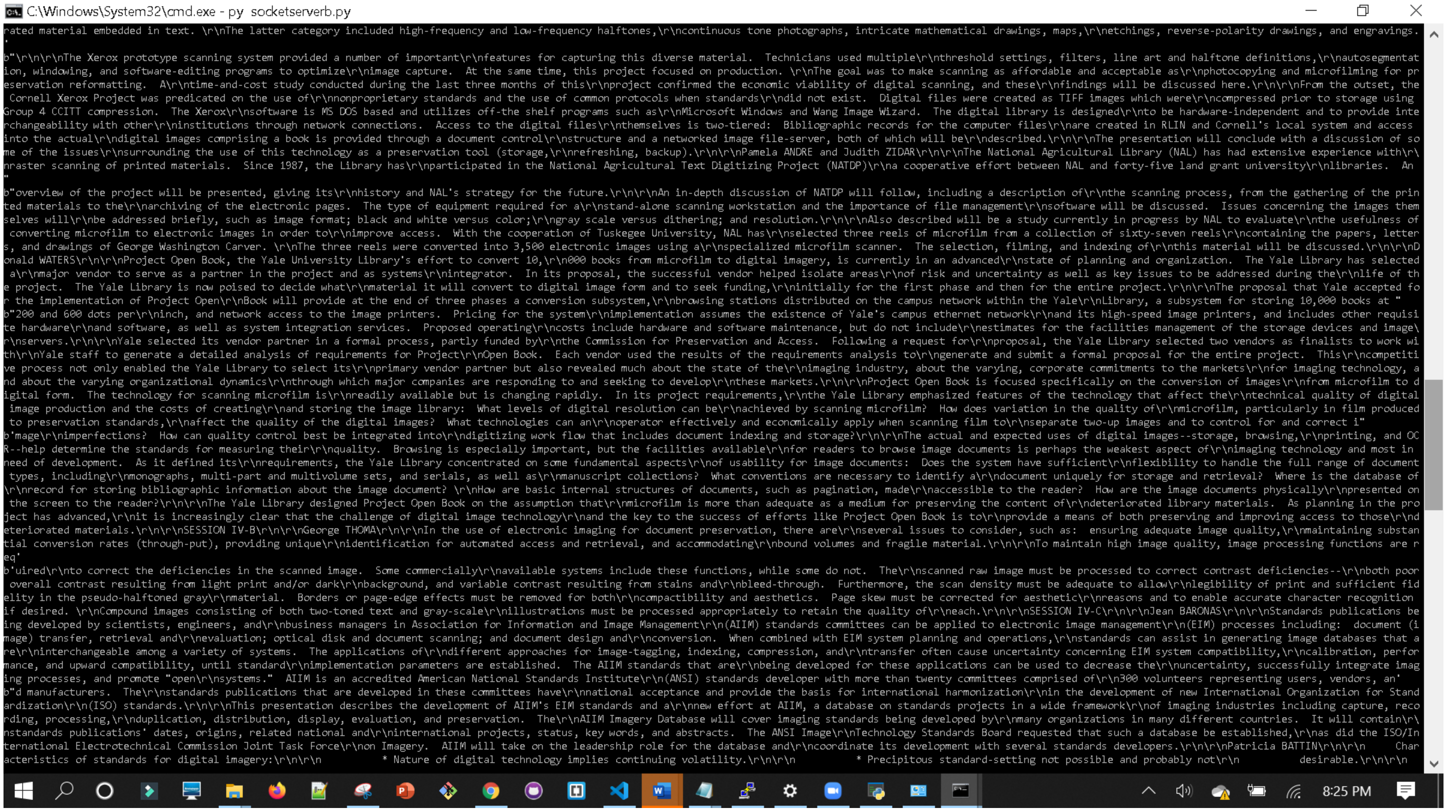

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Group 4 CCITT compression.  The Xerox\r\nsoftware is MS DOS based and utilizes off-the shelf programs such as\r\nMicrosoft Windows and Wang Image Wizard.  The digital library is designed\r\nto be hardware-independent and to provide inte
rchangeability with other\r\ninstitutions through network connections.  Access to the digital files\r\nthemselves is two-tiered:  Bibliographic records for the computer files\r\nare created in RLIN and Cornell's local system and access
into the actual\r\ndigital images comprising a book is provided through a document control\r\nstructure and a networked image file-server, both of which will be\r\ndescribed.\r\n\r\nThe presentation will conclude with a discussion of so
me of the issues\r\nsurrounding the use of this technology as a preservation tool (storage,\r\nrefreshing, backup).\r\n\r\nPamela ANDRE and Judith ZIDAR\r\n\r\nThe National Agricultural Library (NAL) has had extensive experience with\r\
nraster scanning of printed materials.  Since 1987, the Library has\r\nparticipated in the National Agricultural Text Digitizing Project (NATDP)\r\na cooperative effort between NAL and forty-five land grant university\r\nlibraries.  An
"
b"overview of the project will be presented, giving its\r\nhistory and NAL's strategy for the future.\r\n\r\nAn in-depth discussion of NATDP will follow, including a description of\r\nthe scanning process, from the gathering of the prin
ted materials to the\r\narchiving of the electronic pages.  The type of equipment required for a\r\nstand-alone scanning workstation and the importance of file management\r\nsoftware will be discussed.  Issues concerning the images them
selves will\r\nbe addressed briefly, such as image format; black and white versus color;\r\ngray scale versus dithering; and resolution.\r\n\r\nAlso described will be a study currently in progress by NAL to evaluate\r\nthe usefulness of
 converting microfilm to electronic images in order to\r\nimprove access.  With the cooperation of Tuskegee University, NAL has\r\nselected three reels of microfilm from a collection of sixty-seven reels\r\ncontaining the papers, letter
s, and drawings of George Washington Carver. \r\nThe three reels were converted into 3,500 electronic images using a\r\nspecialized microfilm scanner.  The selection, filming, and indexing of\r\nthis material will be discussed.\r\n\r\nD
onald WATERS\r\n\r\nProject Open Book, the Yale University Library's effort to convert 10,\r\n000 books from microfilm to digital imagery, is currently in an advanced\r\nstate of planning and organization.  The Yale Library has selected
 a\r\nmajor vendor to serve as a partner in the project and as systems\r\nintegrator.  In its proposal, the successful vendor helped isolate areas\r\nof risk and uncertainty as well as key issues to be addressed during the\r\nlife of th
e project.  The Yale Library is now poised to decide what\r\nmaterial it will convert to digital image form and to seek funding,\r\ninitially for the first phase and then for the entire project.\r\n\r\nThe proposal that Yale accepted fo
r the implementation of Project Open\r\nBook will provide at the end of three phases a conversion subsystem,\r\nbrowsing stations distributed on the campus network within the Yale\r\nLibrary, a subsystem for storing 10,000 books at "
b"200 and 600 dots per\r\ninch, and network access to the image printers.  Pricing for the system\r\nimplementation assumes the existence of Yale's campus ethernet network\r\nand its high-speed image printers, and includes other requisi
te hardware\r\nand software, as well as system integration services.  Proposed operating\r\ncosts include hardware and software maintenance, but do not include\r\nestimates for the facilities management of the storage devices and image\
r\nservers.\r\n\r\nYale selected its vendor partner in a formal process, partly funded by\r\nthe Commission for Preservation and Access.  Following a request for\r\nproposal, the Yale Library selected two vendors as finalists to work wi
th\r\nYale staff to generate a detailed analysis of requirements for Project\r\nOpen Book.  Each vendor used the results of the requirements analysis to\r\ngenerate and submit a formal proposal for the entire project.  This\r\ncompetiti
ve process not only enabled the Yale Library to select its\r\nprimary vendor partner but also revealed much about the state of the\r\nimaging industry, about the varying, corporate commitments to the markets\r\nfor imaging technology, a
nd about the varying organizational dynamics\r\nthrough which major companies are responding to and seeking to develop\r\nthese markets.\r\n\r\nProject Open Book is focused specifically on the conversion of images\r\nfrom microfilm to d
igital form.  The technology for scanning microfilm is\r\nreadily available but is changing rapidly.  In its project requirements,\r\nthe Yale Library emphasized features of the technology that affect the\r\ntechnical quality of digital
 image production and the costs of creating\r\nand storing the image library:  What levels of digital resolution can be\r\nachieved by scanning microfilm?  How does variation in the quality of\r\nmicrofilm, particularly in film produced
 to preservation standards,\r\naffect the quality of the digital images?  What technologies can an\r\noperator effectively and economically apply when scanning film to\r\nseparate two-up images and to control for and correct i"
b'mage\r\nimperfections?  How can quality control best be integrated into\r\ndigitizing work flow that includes document indexing and storage?\r\n\r\nThe actual and expected uses of digital images--storage, browsing,\r\nprinting, and OC
R--help determine the standards for measuring their\r\nquality.  Browsing is especially important, but the facilities available\r\nfor readers to browse image documents is perhaps the weakest aspect of\r\nimaging technology and most in
need of development.  As it defined its\r\nrequirements, the Yale Library concentrated on some fundamental aspects\r\nof usability for image documents:  Does the system have sufficient\r\nflexibility to handle the full range of document
 types, including\r\nmonographs, multi-part and multivolume sets, and serials, as well as\r\nmanuscript collections?  What conventions are necessary to identify a\r\ndocument uniquely for storage and retrieval?  Where is the database of
\r\nrecord for storing bibliographic information about the image document? \r\nHow are basic internal structures of documents, such as pagination, made\r\naccessible to the reader?  How are the image documents physically\r\npresented on
 the screen to the reader?\r\n\r\nThe Yale Library designed Project Open Book on the assumption that\r\nmicrofilm is more than adequate as a medium for preserving the content of\r\ndeteriorated library materials.  As planning in the pro
ject has advanced,\r\nit is increasingly clear that the challenge of digital image technology\r\nand the key to the success of efforts like Project Open Book is to\r\nprovide a means of both preserving and improving access to those\r\nd
eteriorated materials.\r\n\r\nSESSION IV-B\r\n\r\nGeorge THOMA\r\n\r\nIn the use of electronic imaging for document preservation, there are\r\nseveral issues to consider, such as:  ensuring adequate image quality,\r\nmaintaining substan
tial conversion rates (through-put), providing unique\r\nidentification for automated access and retrieval, and accommodating\r\nbound volumes and fragile material.\r\n\r\nTo maintain high image quality, image processing functions are r
eq'
b'uired\r\nto correct the deficiencies in the scanned image.  Some commercially\r\navailable systems include these functions, while some do not.  The\r\nscanned raw image must be processed to correct contrast deficiencies--\r\nboth poor
 overall contrast resulting from light print and/or dark\r\nbackground, and variable contrast resulting from stains and\r\nbleed-through.  Furthermore, the scan density must be adequate to allow\r\nlegibility of print and sufficient fid
elity in the pseudo-halftoned gray\r\nmaterial.  Borders or page-edge effects must be removed for both\r\ncompactibility and aesthetics.  Page skew must be corrected for aesthetic\r\nreasons and to enable accurate character recognition
if desired. \r\nCompound images consisting of both two-toned text and gray-scale\r\nillustrations must be processed appropriately to retain the quality of\r\neach.\r\n\r\nSESSION IV-C\r\n\r\nJean BARONAS\r\n\r\nStandards publications be
ing developed by scientists, engineers, and\r\nbusiness managers in Association for Information and Image Management\r\n(AIIM) standards committees can be applied to electronic image management\r\n(EIM) processes including:  document (i
mage) transfer, retrieval and\r\nevaluation; optical disk and document scanning; and document design and\r\nconversion.  When combined with EIM system planning and operations,\r\nstandards can assist in generating image databases that a
re\r\ninterchangeable among a variety of systems.  The applications of\r\ndifferent approaches for image-tagging, indexing, compression, and\r\ntransfer often cause uncertainty concerning EIM system compatibility,\r\ncalibration, perfor
mance, and upward compatibility, until standard\r\nimplementation parameters are established.  The AIIM standards that are\r\nbeing developed for these applications can be used to decrease the\r\nuncertainty, successfully integrate imag
ing processes, and promote "open\r\nsystems."  AIIM is an accredited American National Standards Institute\r\n(ANSI) standards developer with more than twenty committees comprised of\r\n300 volunteers representing users, vendors, an'
b"d manufacturers.  The\r\nstandards publications that are developed in these committees have\r\nnational acceptance and provide the basis for international harmonization\r\nin the development of new International Organization for Stand
ardization\r\n(ISO) standards.\r\n\r\nThis presentation describes the development of AIIM's EIM standards and a\r\nnew effort at AIIM, a database on standards projects in a wide framework\r\nof imaging industries including capture, reco
rding, processing,\r\nduplication, distribution, display, evaluation, and preservation.  The\r\nAIIM Imagery Database will cover imaging standards being developed by\r\nmany organizations in many different countries.  It will contain\r\
nstandards publications' dates, origins, related national and\r\ninternational projects, status, key words, and abstracts.  The ANSI Image\r\nTechnology Standards Board requested that such a database be established,\r\nas did the ISO/In
ternational Electrotechnical Commission Joint Task Force\r\non Imagery.  AIIM will take on the leadership role for the database and\r\ncoordinate its development with several standards developers.\r\n\r\nPatricia BATTIN\r\n\r\n     Char
acteristics of standards for digital imagery:\r\n\r\n          * Nature of digital technology implies continuing volatility.\r\n\r\n          * Precipitous standard-setting not possible and probably not\r\n          desirable.\r\n\r\n
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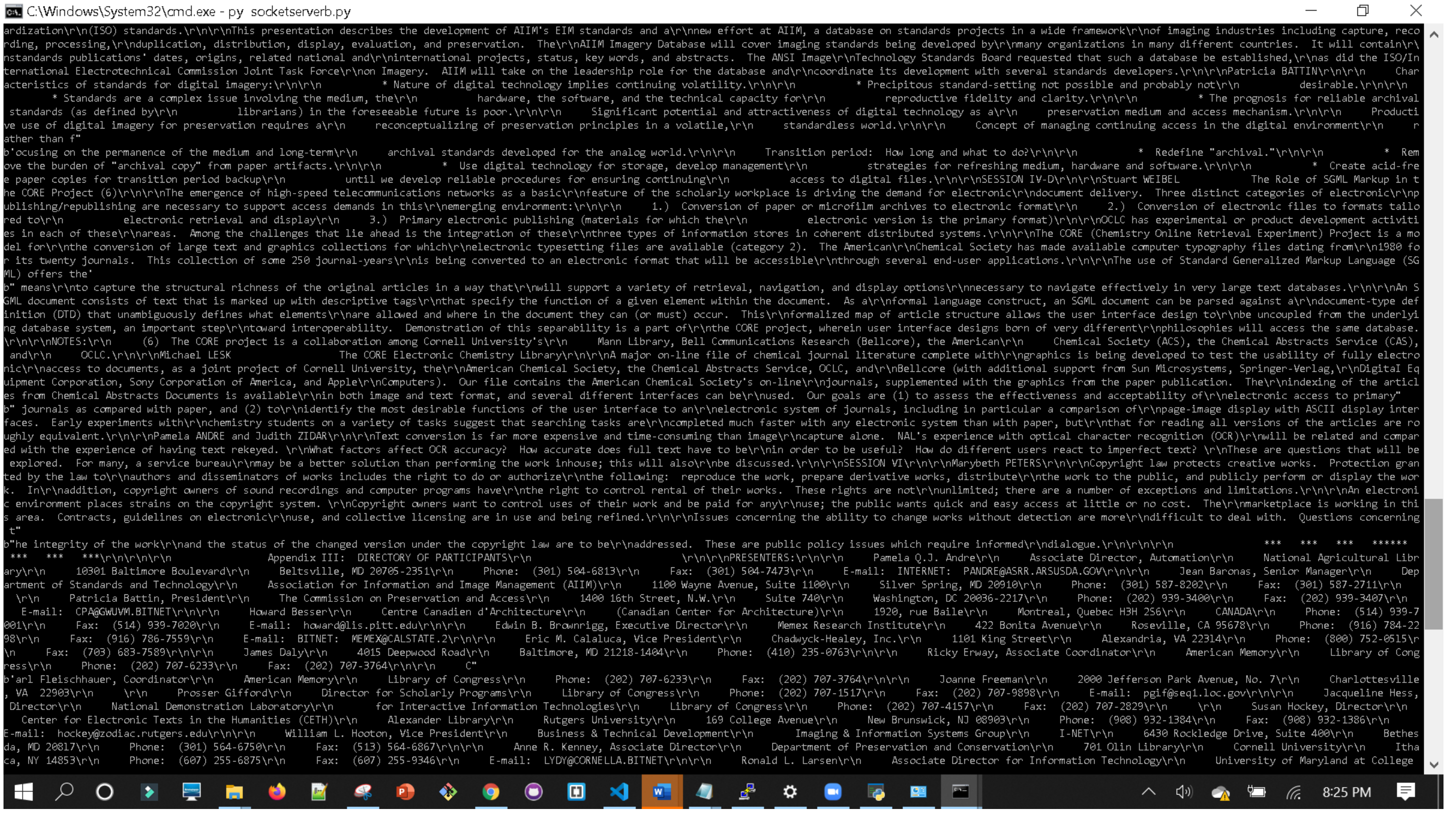

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acteristics of standards for digital imagery:\r\n\r\n          * Nature of digital technology implies continuing volatility.\r\n\r\n          * Precipitous standard-setting not possible and probably not\r\n          desirable.\r\n\r\n
        * Standards are a complex issue involving the medium, the\r\n          hardware, the software, and the technical capacity for\r\n          reproductive fidelity and clarity.\r\n\r\n          * The prognosis for reliable archival
 standards (as defined by\r\n          librarians) in the foreseeable future is poor.\r\n\r\n     Significant potential and attractiveness of digital technology as a\r\n     preservation medium and access mechanism.\r\n\r\n     Producti
ve use of digital imagery for preservation requires a\r\n     reconceptualizing of preservation principles in a volatile,\r\n     standardless world.\r\n\r\n     Concept of managing continuing access in the digital environment\r\n     r
ather than f"
b'ocusing on the permanence of the medium and long-term\r\n     archival standards developed for the analog world.\r\n\r\n     Transition period:  How long and what to do?\r\n\r\n          *  Redefine "archival."\r\n\r\n          *  Rem
ove the burden of "archival copy" from paper artifacts.\r\n\r\n          *  Use digital technology for storage, develop management\r\n          strategies for refreshing medium, hardware and software.\r\n\r\n          *  Create acid-fre
e paper copies for transition period backup\r\n          until we develop reliable procedures for ensuring continuing\r\n          access to digital files.\r\n\r\nSESSION IV-D\r\n\r\nStuart WEIBEL            The Role of SGML Markup in t
he CORE Project (6)\r\n\r\nThe emergence of high-speed telecommunications networks as a basic\r\nfeature of the scholarly workplace is driving the demand for electronic\r\ndocument delivery.  Three distinct categories of electronic\r\np
ublishing/republishing are necessary to support access demands in this\r\nemerging environment:\r\n\r\n     1.)  Conversion of paper or microfilm archives to electronic format\r\n     2.)  Conversion of electronic files to formats tailo
red to\r\n          electronic retrieval and display\r\n     3.)  Primary electronic publishing (materials for which the\r\n          electronic version is the primary format)\r\n\r\nOCLC has experimental or product development activiti
es in each of these\r\nareas.  Among the challenges that lie ahead is the integration of these\r\nthree types of information stores in coherent distributed systems.\r\n\r\nThe CORE (Chemistry Online Retrieval Experiment) Project is a mo
del for\r\nthe conversion of large text and graphics collections for which\r\nelectronic typesetting files are available (category 2).  The American\r\nChemical Society has made available computer typography files dating from\r\n1980 fo
r its twenty journals.  This collection of some 250 journal-years\r\nis being converted to an electronic format that will be accessible\r\nthrough several end-user applications.\r\n\r\nThe use of Standard Generalized Markup Language (SG
ML) offers the'
b" means\r\nto capture the structural richness of the original articles in a way that\r\nwill support a variety of retrieval, navigation, and display options\r\nnecessary to navigate effectively in very large text databases.\r\n\r\nAn S
GML document consists of text that is marked up with descriptive tags\r\nthat specify the function of a given element within the document.  As a\r\nformal language construct, an SGML document can be parsed against a\r\ndocument-type def
inition (DTD) that unambiguously defines what elements\r\nare allowed and where in the document they can (or must) occur.  This\r\nformalized map of article structure allows the user interface design to\r\nbe uncoupled from the underlyi
ng database system, an important step\r\ntoward interoperability.  Demonstration of this separability is a part of\r\nthe CORE project, wherein user interface designs born of very different\r\nphilosophies will access the same database.
\r\n\r\nNOTES:\r\n     (6)  The CORE project is a collaboration among Cornell University's\r\n     Mann Library, Bell Communications Research (Bellcore), the American\r\n     Chemical Society (ACS), the Chemical Abstracts Service (CAS),
 and\r\n     OCLC.\r\n\r\nMichael LESK                The CORE Electronic Chemistry Library\r\n\r\nA major on-line file of chemical journal literature complete with\r\ngraphics is being developed to test the usability of fully electro
nic\r\naccess to documents, as a joint project of Cornell University, the\r\nAmerican Chemical Society, the Chemical Abstracts Service, OCLC, and\r\nBellcore (with additional support from Sun Microsystems, Springer-Verlag,\r\nDigital Eq
uipment Corporation, Sony Corporation of America, and Apple\r\nComputers).  Our file contains the American Chemical Society's on-line\r\njournals, supplemented with the graphics from the paper publication.  The\r\nindexing of the articl
es from Chemical Abstracts Documents is available\r\nin both image and text format, and several different interfaces can be\r\nused.  Our goals are (1) to assess the effectiveness and acceptability of\r\nelectronic access to primary"
b" journals as compared with paper, and (2) to\r\nidentify the most desirable functions of the user interface to an\r\nelectronic system of journals, including in particular a comparison of\r\npage-image display with ASCII display inter
faces.  Early experiments with\r\nchemistry students on a variety of tasks suggest that searching tasks are\r\ncompleted much faster with any electronic system than with paper, but\r\nthat for reading all versions of the articles are ro
ughly equivalent.\r\n\r\nPamela ANDRE and Judith ZIDAR\r\n\r\nText conversion is far more expensive and time-consuming than image\r\ncapture alone.  NAL's experience with optical character recognition (OCR)\r\nwill be related and compar
ed with the experience of having text rekeyed. \r\nWhat factors affect OCR accuracy?  How accurate does full text have to be\r\nin order to be useful?  How do different users react to imperfect text? \r\nThese are questions that will be
 explored.  For many, a service bureau\r\nmay be a better solution than performing the work inhouse; this will also\r\nbe discussed.\r\n\r\nSESSION VI\r\n\r\nMarybeth PETERS\r\n\r\nCopyright law protects creative works.  Protection gran
ted by the law to\r\nauthors and disseminators of works includes the right to do or authorize\r\nthe following:  reproduce the work, prepare derivative works, distribute\r\nthe work to the public, and publicly perform or display the wor
k.  In\r\naddition, copyright owners of sound recordings and computer programs have\r\nthe right to control rental of their works.  These rights are not\r\nunlimited; there are a number of exceptions and limitations.\r\n\r\nAn electroni
c environment places strains on the copyright system. \r\nCopyright owners want to control uses of their work and be paid for any\r\nuse; the public wants quick and easy access at little or no cost.  The\r\nmarketplace is working in thi
s area.  Contracts, guidelines on electronic\r\nuse, and collective licensing are in use and being refined.\r\n\r\nIssues concerning the ability to change works without detection are more\r\ndifficult to deal with.  Questions concerning
 t"
b"he integrity of the work\r\nand the status of the changed version under the copyright law are to be\r\naddressed.  These are public policy issues which require informed\r\ndialogue.\r\n\r\n\r\n\r\n               ***   ***   ***   ******
 ***   ***   ***\r\n\r\n\r\n\r\n                Appendix III:  DIRECTORY OF PARTICIPANTS\r\n                         \r\n\r\nPRESENTERS:\r\n\r\n     Pamela Q.J. Andre\r\n     Associate Director, Automation\r\n     National Agricultural Libr
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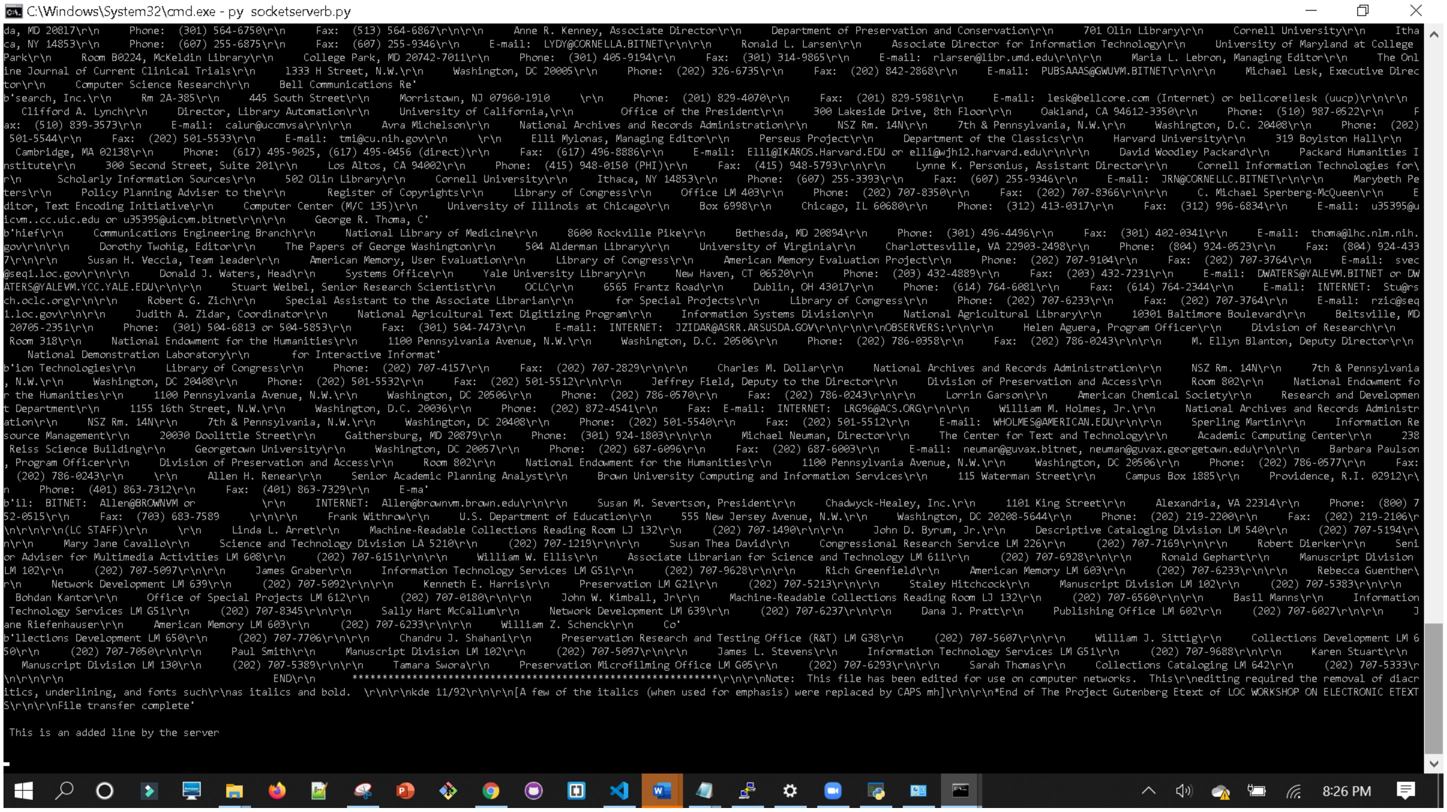

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 Reiss Science Building\r\n     Georgetown University\r\n     Washington, DC 20057\r\n     Phone:  (202) 687-6096\r\n     Fax:  (202) 687-6003\r\n     E-mail:  neuman@guvax.bitnet, neuman@guvax.georgetown.edu\r\n\r\n     Barbara Paulson
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itics, underlining, and fonts such\r\nas italics and bold.  \r\n\r\nkde 11/92\r\n\r\n[A few of the italics (when used for emphasis) were replaced by CAPS mh]\r\n\r\n*End of The Project Gutenberg Etext of LOC WORKSHOP ON ELECTRONIC ETEXT
S\r\n\r\nFile transfer complete'

 This is an added line by the server
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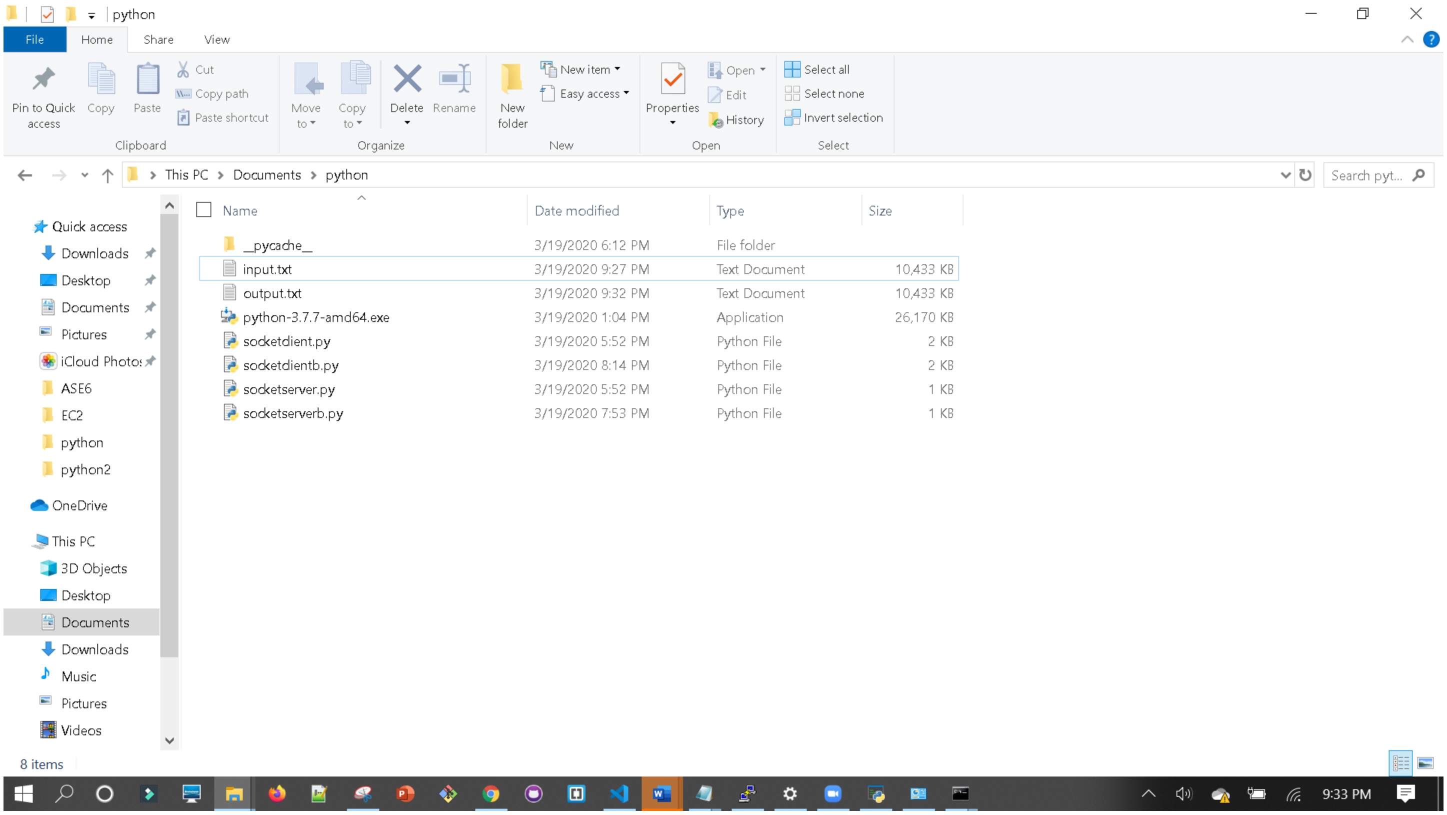
>>Server saves the file in a local system

>>File name: output.txt

>>Size: 10.01MB



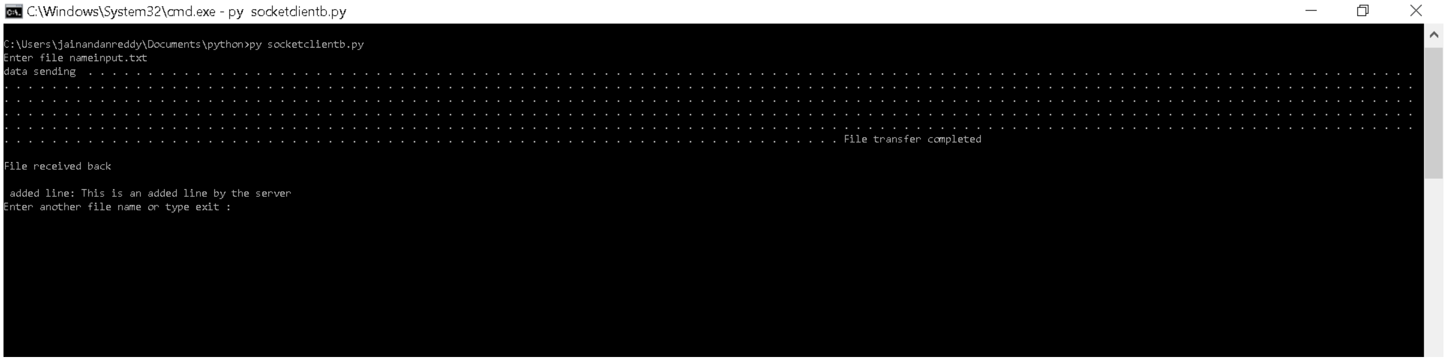
Name	Date modified	Type	Size
__pycache__	3/19/2020 6:12 PM	File folder	
input.txt	3/19/2020 9:27 PM	Text Document	10,433 KB
output.txt	3/19/2020 9:32 PM	Text Document	10,433 KB
python-3.7.7-amd64.exe	3/19/2020 1:04 PM	Application	26,170 KB
socketclient.py	3/19/2020 5:52 PM	Python File	2 KB
socketclientb.py	3/19/2020 8:14 PM	Python File	2 KB
socketserver.py	3/19/2020 5:52 PM	Python File	1 KB
socketserverb.py	3/19/2020 7:53 PM	Python File	1 KB

>>Server appends one more line which is “This is an added line from a server” to the file,

>>Server sent updated file back to the client

>>Client display the newly added lines from the server, not the entire file content.

>>Which is --- This is the added line by the server



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C:\Users\jainandanreddy\Documents\python>py socketclientb.py
Enter file nameinput.txt
data sending . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
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. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . File transfer completed

File received back

 added line: This is an added line by the server
Enter another file name or type exit :
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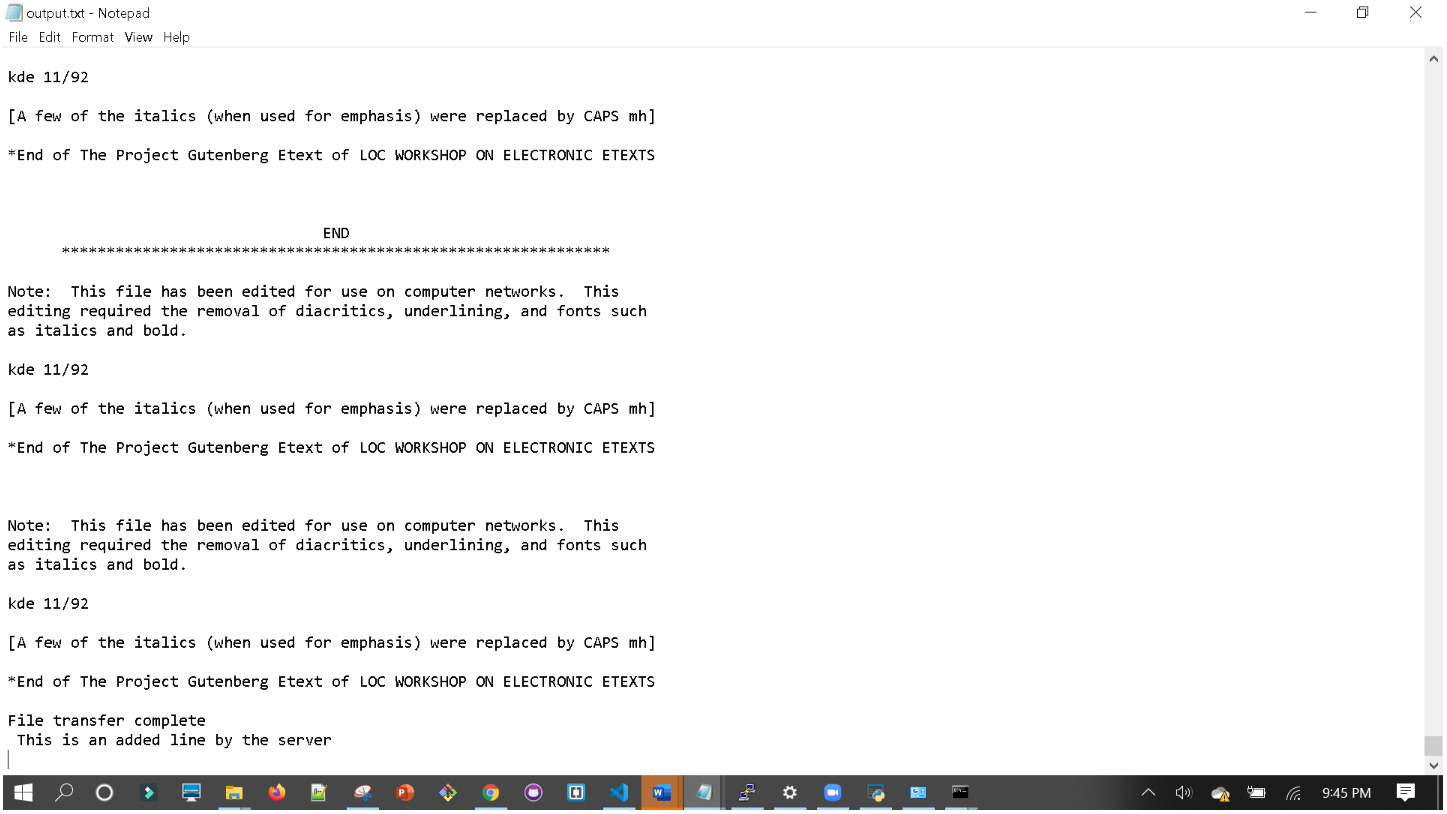
>>Output file-- we can see added line at the bottom



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File transfer complete
 This is an added line by the server
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