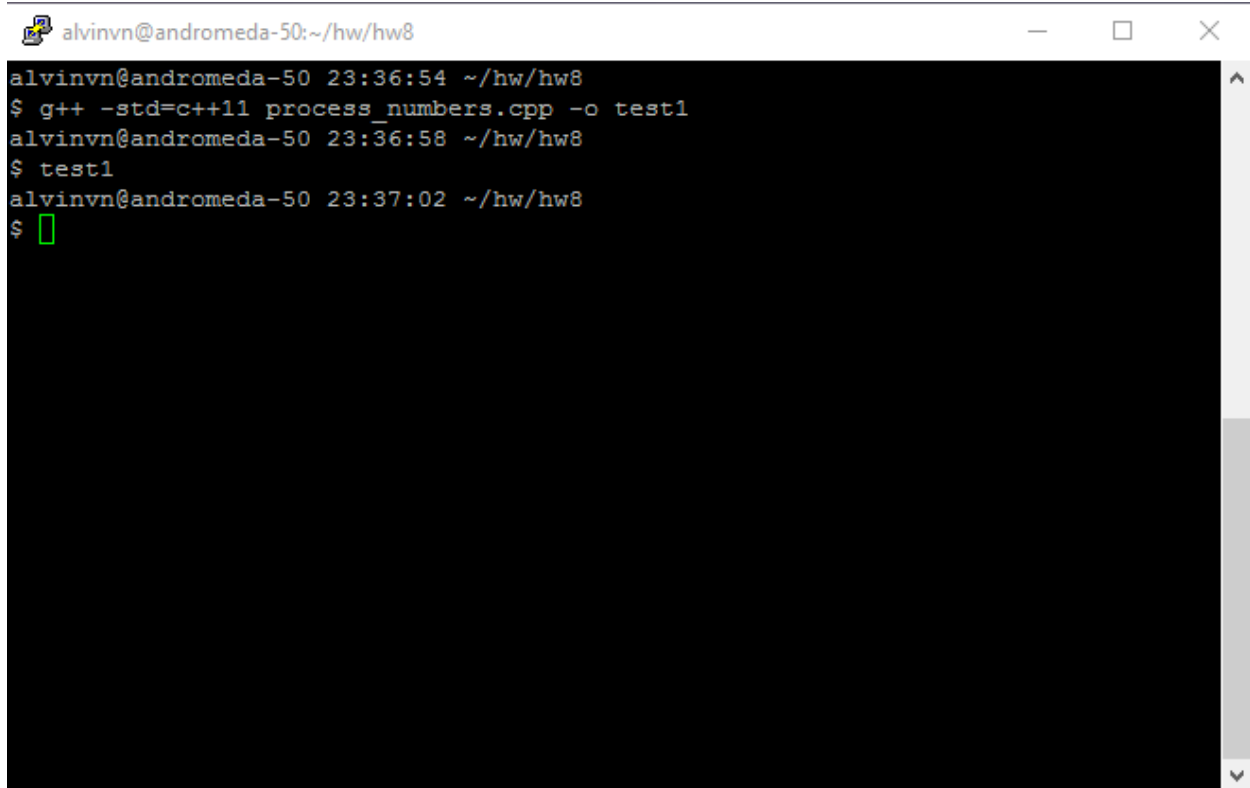


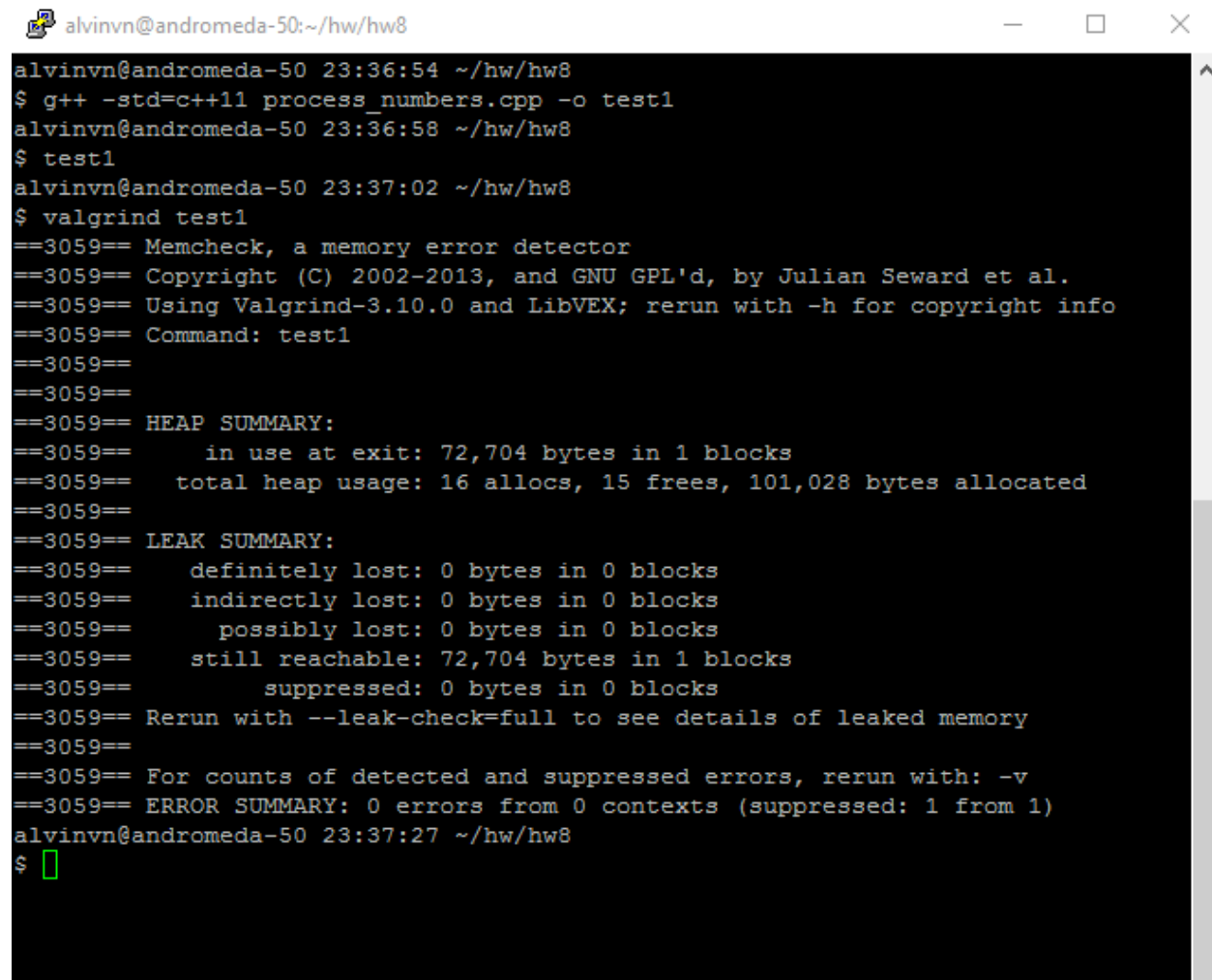
HW 8 REPORT:

PROCESS_NUMB:

A terminal window with a title bar showing 'alvinvn@andromeda-50:~/hw/hw8'. The window contains a series of commands and their outputs. The first line shows the user at the prompt. The second line shows the compilation of 'process_numbers.cpp' into 'test1' using g++ with the -std=c++11 flag. The third line shows the user at the prompt again. The fourth line shows the execution of 'test1'. The fifth line shows the user at the prompt. The sixth line shows the execution of 'test1' again, with a green cursor visible at the end of the line. The terminal has a dark background and a light-colored title bar.

```
alvinvn@andromeda-50 23:36:54 ~/hw/hw8
$ g++ -std=c++11 process_numbers.cpp -o test1
alvinvn@andromeda-50 23:36:58 ~/hw/hw8
$ test1
alvinvn@andromeda-50 23:37:02 ~/hw/hw8
$ █
```

PROCESS_NUMB WITH VALGRIND:



```
alvinvn@andromeda-50:~/hw/hw8
alvinvn@andromeda-50 23:36:54 ~/hw/hw8
$ g++ -std=c++11 process_numbers.cpp -o test1
alvinvn@andromeda-50 23:36:58 ~/hw/hw8
$ test1
alvinvn@andromeda-50 23:37:02 ~/hw/hw8
$ valgrind test1
==3059== Memcheck, a memory error detector
==3059== Copyright (C) 2002-2013, and GNU GPL'd, by Julian Seward et al.
==3059== Using Valgrind-3.10.0 and LibVEX; rerun with -h for copyright info
==3059== Command: test1
==3059==
==3059==
==3059== HEAP SUMMARY:
==3059==    in use at exit: 72,704 bytes in 1 blocks
==3059==   total heap usage: 16 allocs, 15 frees, 101,028 bytes allocated
==3059==
==3059== LEAK SUMMARY:
==3059==    definitely lost: 0 bytes in 0 blocks
==3059==    indirectly lost: 0 bytes in 0 blocks
==3059==    possibly lost: 0 bytes in 0 blocks
==3059==    still reachable: 72,704 bytes in 1 blocks
==3059==           suppressed: 0 bytes in 0 blocks
==3059== Rerun with --leak-check=full to see details of leaked memory
==3059==
==3059== For counts of detected and suppressed errors, rerun with: -v
==3059== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 1 from 1)
alvinvn@andromeda-50 23:37:27 ~/hw/hw8
$ █
```

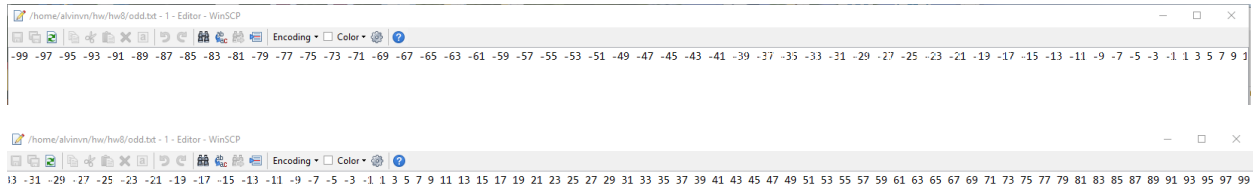
EVEN OUTPUT:



-98
-96
-94
-92
-90
-88
-86
-84
-82
-80
-78
-76
-74
-72
-70
-68
-66
-64
-62
-60
-58
-56
-54
-52
-50
-48
-46
-44
-42
-40
-38
-36
-34
-32
-30
-28
-26
-24
-22
-20
-18
-16
-14
-12
-10
-8
-6
-4
-2
0
2

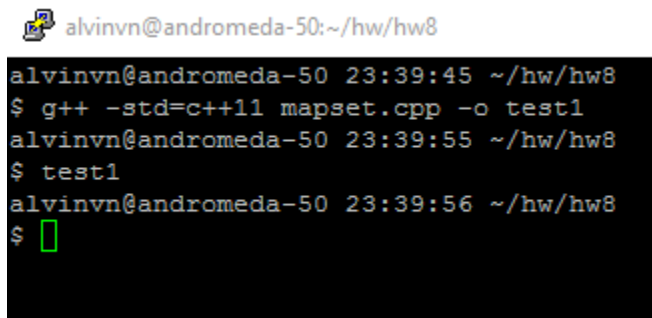
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
50
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
84
86
88
90
92
94
96
98
100

ODD OUTPUT:



The image shows two overlapping WinSCP editor windows. The top window is titled '/home/alvinvn/hw/hw8/odd.txt - 1 - Editor - WinSCP' and displays a single line of 100 numbers: -99 -97 -95 -93 -91 -89 -87 -85 -83 -81 -79 -77 -75 -73 -71 -69 -67 -65 -63 -61 -59 -57 -55 -53 -51 -49 -47 -45 -43 -41 -39 -37 -35 -33 -31 -29 -27 -25 -23 -21 -19 -17 -15 -13 -11 -9 -7 -5 -3 -1 1 3 5 7 9 11. The bottom window is titled '/home/alvinvn/hw/hw8/odd.txt - 1 - Editor - WinSCP' and displays a single line of 100 numbers: 13 -31 -29 -27 -25 -23 -21 -19 -17 -15 -13 -11 -9 -7 -5 -3 -1 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75 77 79 81 83 85 87 89 91 93 95 97 99.

MAPSET:



The image shows a terminal window with the prompt 'alvinvn@andromeda-50:~/hw/hw8'. The user enters the following commands and receives the following output:


```
alvinvn@andromeda-50 23:39:45 ~/hw/hw8
$ g++ -std=c++11 mapset.cpp -o test1
alvinvn@andromeda-50 23:39:55 ~/hw/hw8
$ test1
alvinvn@andromeda-50 23:39:56 ~/hw/hw8
$
```






MAPSET WITH VALGRIND:

```
alvinvn@andromeda-50:~/hw/hw8
alvinvn@andromeda-50 23:39:45 ~/hw/hw8
$ g++ -std=c++11 mapset.cpp -o test1
alvinvn@andromeda-50 23:39:55 ~/hw/hw8
$ test1
alvinvn@andromeda-50 23:39:56 ~/hw/hw8
$ valgrind test1
==3104== Memcheck, a memory error detector
==3104== Copyright (C) 2002-2013, and GNU GPL'd, by Julian Seward et al.
==3104== Using Valgrind-3.10.0 and LibVEX; rerun with -h for copyright info
==3104== Command: test1
==3104==
==3104==
==3104== HEAP SUMMARY:
==3104==    in use at exit: 72,704 bytes in 1 blocks
==3104==   total heap usage: 815 allocs, 814 frees, 155,768 bytes allocated
==3104==
==3104== LEAK SUMMARY:
==3104==    definitely lost: 0 bytes in 0 blocks
==3104==    indirectly lost: 0 bytes in 0 blocks
==3104==    possibly lost: 0 bytes in 0 blocks
==3104==    still reachable: 72,704 bytes in 1 blocks
==3104==         suppressed: 0 bytes in 0 blocks
==3104== Rerun with --leak-check=full to see details of leaked memory
==3104==
==3104== For counts of detected and suppressed errors, rerun with: -v
==3104== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 1 from 1)
alvinvn@andromeda-50 23:42:13 ~/hw/hw8
$ █
```

FREQUENCY OUTPUT:

Line: 1/633 Column: 1 Character: 97

 /home/alvinvn/hw/hw8/frequency.txt - 1 - Editor - WinSCP




Encodi

```
assembly: 6
at: 4
automata: 1
automate: 1
babbage: 1
basic: 1
bc: 2
be: 12
became: 2
because: 3
become: 1
becoming: 1
been: 2
beginning: 1
bernoulli: 1
besides: 1
beyond: 2
binary: 1
build: 1
building: 1
built: 1
but: 2
by: 7
c: 3
calculate: 1
calculating: 1
calculation: 1
calculations: 2
calculator: 1
calculators: 1
calculus: 1
calendars: 1
call: 1
called: 1
cams: 1
card: 3
cards: 8
career: 2
cases: 1
certification: 1
challenges: 1
changes: 1
charles: 1
china: 1
circa: 1
clearance: 1
cloth: 1
cobol: 1
code: 6
coding: 2
cognitive: 1
combines: 1
commercial: 1
commonly: 1
community: 1
```








Line: 1/634


Column: 1

Character: 97 (0)



/home/alvinvn/hw/hw8/frequency.txt - 1 - Editor - WinSCP



Encoding ▾ ☐ Color ▾ 

community: 1
company: 1
compiler: 1
complicated: 1
computation: 1
computational: 1
compute: 1
computer: 11
computers: 3
computing: 2
conceive: 1
conception: 1
condition: 1
configuration: 1
considerably: 1
considered: 2
consistent: 1
consumption: 1
control: 4
convenient: 1
converted: 1
core: 1
corrections: 1
correctness: 1
cost: 1
could: 5
countries: 3
covers: 1
craft: 1
crafted: 1
created: 1
criteria: 1
critical: 1
cultures: 1
cycle: 1
data: 4
dates: 1
debatable: 1
debate: 3
debugging: 1
decisions: 1
defined: 1
derived: 1
design: 1
develop: 1
developed: 7
developing: 1
development: 5
device: 2
devices: 2
devising: 1
different: 10
differs: 1
directly: 2
discarded: 1

Line: 1/634

Column: 1

Character: 97 (0x61)

Encoding:

```

/home/alvinvn/hw/hw8/frequency.txt - 1 - Editor - WinSCP
[Icons] Encoding ▾ Color ▾ [Settings] [Help]
directly: 2
discarded: 1
discipline: 4
do: 3
domain: 1
dozens: 1
drive: 1
drum: 2
drummer: 1
due: 1
each: 2
early: 1
easier: 1
easily: 1
easy: 1
economic: 1
editors: 1
efficient: 2
efficiently: 1
eg: 4
elementary: 1
elements: 1
employed: 1
engine: 5
engineer: 1
engineering: 4
engineers: 1
enough: 1
entered: 1
entering: 3
entirely: 1
entities: 1
environments: 1
era: 2
error: 2
europe: 1
even: 1
every: 1
evolvable: 2
executable: 1
exhaustion: 1
existed: 1
expertise: 1
expressed: 1
extent: 2
fact: 1
faster: 1
few: 1
final: 1
find: 1
first: 4
follow: 1
for: 15
force: 1
form: 3
formal: 1
Line: 1/634      Column: 1      Character: 97 (0x61)      Encoding: 1252 (ANSI)
```

```
/home/alvinvn/hw/hw8/frequency.txt - 1 - Editor - WinSCP
[Icons] Encoding ▾ Color ▾

formal: 1
format: 1
forms: 1
formula: 2
formulation: 1
fortran: 3
found: 1
foundation: 2
founded: 1
from: 5
functional: 1
fundamental: 1
gears: 1
general: 3
generating: 1
geometry: 1
giant: 1
given: 1
goal: 1
good: 1
governmentally: 1
greater: 1
greece: 1
habitual: 1
had: 4
hardware: 2
has: 3
haskell: 1
have: 6
having: 1
he: 3
herman: 1
high: 2
high-level: 3
higher: 1
his: 2
history: 1
hole: 1
holes: 1
hollerith: 2
how: 1
however: 2
human: 2
humans: 1
hypothesis: 1
i: 1
ibm: 3
idea: 1
ie: 1
illegal: 1
implementation: 5
importing: 1
impractical: 1
in: 43
include: 3

Line: 1/634 Column: 1 Character: 97 (0x61) Encodi
```


/home/alvinvn/hw/hw8/frequency.txt - 1 - Editor - WinSCP















include: 3
including: 3
increase: 1
increasing: 1
increasingly: 2
incur: 1
india: 1
industry: 1
inexpensive: 1
influences: 1
initial: 1
input: 1
instead: 1
institution: 1
instruction: 2
instructions: 7
instruments: 2
intent: 1
into: 4
invented: 5
invention: 1
inventions: 1
involves: 1
is: 22
it: 7
its: 2
jacquard: 3
japan: 1
java: 1
javascript: 1
jobs: 1
joseph: 1
just: 1
keypunch: 1
knowledge: 1
known: 2
kurdish: 1
labor: 1
language: 16
languages: 11
larger: 1
late: 2
later: 3
leads: 1
leaps: 1
learn: 1
led: 1
less: 3
let: 1
level: 2
levers: 1
license: 1
licensed: 1
licensing: 1
likely: 1


Line: 1/634 Column: 1 Character: 97 (0x61) Encoding: 1252 (ANSI)

```
/home/alvinvn/hw/hw8/frequency.txt - 1 - Editor - WinSCP
likely: 1
linguistics: 1
list: 1
lists: 1
little: 1
locations: 1
logic: 1
loom: 3
looms: 1
lovelace: 1
low-level: 1
lower: 1
lunar-to-solar: 1
machine: 10
machines: 4
made: 3
maintaining: 1
making: 1
management: 1
manner: 1
many: 5
marie: 1
mathematician: 1
maximum: 1
may: 2
meant: 1
measured: 1
mechanical: 2
mechanism: 2
mechanisms: 1
mechanized: 1
media: 1
medieval: 1
medium: 1
memory: 1
method: 1
metonic: 1
might: 2
model: 1
modern: 4
more: 10
most: 1
mostly: 1
much: 3
musical: 1
mutual: 1
name: 1
nature: 1
necessary: 1
need: 1
neumann: 1
new: 1
no: 1
not: 3
notation: 3
Line: 1/634      Column: 1      Character: 97 (0x61)      Encoding: 1252 (ANSI - L
```

```
/home/alvinvn/hw/hw8/frequency.txt - 1 - Editor - WinSCP
numbers: 2
numerical: 2
objective-c: 1
objects: 1
occasionally: 1
of: 63
often: 4
olympiads: 1
on: 4
one: 4
oneself: 1
ongoing: 2
only: 1
operated: 1
operating: 1
operation: 2
operations: 3
opportunities: 1
opposed: 1
or: 11
order: 1
organize: 1
original: 2
other: 4
output: 2
outsourcing: 1
overhead: 1
painstakingly: 1
panel: 1
panels: 1
paper: 3
part: 1
particular: 2
particularly: 2
parts: 1
pass: 1
past: 1
pasteboard: 1
pattern: 2
patterns: 3
pegs: 1
percussion: 1
perfectly: 1
perform: 1
performing: 1
perl: 1
phase: 1
php: 1
physically: 1
placed: 1
playing: 1
plugboard: 1
popular: 2
possibility: 1
postulates: 1
Line: 1/634      Column: 1      Character: 97 (0x61)      Encoding: 1252 (ANSI - La
```

 /home/alvinvn/hw/hw8/frequency.txt - 1 - Editor - WinSCP



Encoding ▾ ☐ Color ▾ 

```
postulates: 1
power: 1
practical: 1
practices: 1
predetermined: 1
prior: 1
problem: 2
process: 6
processing: 3
produce: 2
producing: 1
profession: 1
professional: 1
professions: 1
program: 6
programmable: 2
programmed: 1
programmer: 4
programmers: 5
programming: 24
programs: 10
progressed: 1
prone: 1
punch: 1
punched: 7
punching: 1
purpose: 1
python: 1
read: 1
readable: 1
rebuilt: 1
record: 2
recording: 1
referred: 1
regarded: 1
regulated: 1
related: 1
relations: 1
relatively: 1
replace: 1
represented: 1
representing: 2
require: 1
required: 1
requirements: 1
requires: 1
reserved: 1
resources: 1
rhythms: 1
ruby: 1
s: 3
same: 1
sapirwhorf: 1
science: 2
scientist: 1
```

Line: 1/634

Column: 1

Character: 97 (0x61)

Encoding:

science: 2
scientist: 1
security: 1
see: 1
seemed: 1
self-governed: 1
sequence: 3
sequentially: 1
series: 1
services: 1
sets: 2
settled: 1
several: 1
she: 1
shortened: 1
should: 1
sizes: 1
small: 1
smalltalk: 1
software: 9
solution: 1
solving: 1
some: 4
sometimes: 1
sorter: 1
source: 5
speaker: 1
speakers: 1
special: 1
specialized: 1
specific: 2
specified: 1
specify: 2
specifying: 1
speed: 2
spoken: 1
sql: 1
standardized: 1
stands: 1
states: 2
still: 3
storage: 1
stored: 1
strict: 1
subject: 1
subjects: 1
such: 6
sumeria: 1
surrounding: 1
susceptible: 1
symbolic: 1
symbols: 1
synthesis: 1
system: 2
systems: 1


```
/home/alvinvn/hw/hw8/frequency.txt - 1 - Editor - WinSCP
symbolic: 1
symbols: 1
synthesis: 1
system: 2
systems: 1
tabulating: 1
tabulator: 2
takes: 1
tape: 2
target: 1
task: 2
tasks: 1
technical: 1
techniques: 1
term: 2
terminals: 1
terms: 2
testing: 1
tests: 1
text: 3
than: 6
that: 20
the: 97
their: 1
them: 1
themselves: 1
then: 1
theorized: 1
there: 2
these: 8
things: 1
this: 4
those: 2
thought: 2
thoughts: 1
three: 1
thus: 2
time: 2
to: 39
total: 1
tracked: 1
translates: 1
translation: 1
trials: 1
trigger: 1
turn: 1
two: 1
type: 1
typically: 1
typing: 1
underlying: 1
understanding: 1
unit: 2
united: 2
upon: 1
Line: 1/634      Column: 1      Character: 97 (0x61)      Encoding: 1252 (ANS
```

/home/alvinvn/hw/hw8/frequency.txt - 1 - Editor - WinSCP

Encoding ▾ Color ▾

.....

trials: 1
trigger: 1
turn: 1
two: 1
type: 1
typically: 1
typing: 1
underlying: 1
understanding: 1
unit: 2
united: 2
upon: 1
use: 5
used: 3
uses: 2
using: 5
usually: 4
utilizing: 1
various: 2
vary: 1
verification: 1
very: 2
visual: 1
vital: 1
von: 1
wage: 1
was: 5
way: 1
weaves: 1
weaving: 1
well: 1
were: 8
where: 2
whether: 1
which: 13
while: 1
whole: 1
whose: 2
widely-used: 1
will: 1
with: 11
within: 1
without: 2
wooden: 1
world: 3
worlds: 1
would: 2
write: 1
writing: 3
written: 1
wrote: 1
x: 3
y: 1
yield: 1

Line: 1/634 Column: 1 Character: 97 (0x61) Enc