1. Pseudocode

```
STACK_SIZE = 50000
WORD_SIZE = 20
stack[STACK_SIZE][WORD_SIZE]
top = 0
words = 0
wordCount[STACK-SIZE]

Procedure main()
      filename[20]
      word[WORD_SIZE]

      filename = input file name
      open file
      if file not found then
            print error
      endif

      close file

      call sortDecreasing procedure
      call printFirstTen procedure
      call printLastTen procedure
      call printUnique procedure
end

Procedure push(word)
      if top equals STACK_SIZE then return

      i = 0, j = 0
      do
          if letter is Alphabet then
                convert letter to lowercase
                stack[top][j] = letter
                j++
          i++
      while word[i]

      top++
      words++
      return
end

boolean isEmpty(letter)
```

```
      return top equals 0
end

boolean isAlphabet(letter)
      if not Alphabet letter then
            return false
      else
            return true
      endif
end

char formatCharacter(letter)
      if letter is uppercase English letter then
            letter = letter + 32
      endif
      return letter
end

Procedure sortWord
      for index1 = 0 to words
            for index2 = index1 + 1 to words
                  if wordCount[index1] < wordCount[index2] then
                        swap stack[index1] with stack[index2]
                        swap wordCount[index1] with wordCount[index2]
                  Endif
            endfor
      endfor

      for index1 = 0 to words
            for index2 = i + 1 to words
                  if wordCount[index1] equals wordCount[index2]
                        if stack[index1] needs to swap with
stack[index2] then
                              swap
                        endif
                  endif
            endfor
      endfor
end
```

```
Procedure printFirstTen
      for index = 0 to 10
            print stack[index] + wordCount[index]
      endfor
end


Procedure printLastTen
      for index = words - 10 to words
            print stack[index] + wordCount[index]
      endfor
end


Procedure printUnique
      for index = 0 to words
            if checkUnique(1) == 1 then
                  print word
            endif
      endfor
end


integer checkUnique(index1)
      occurrences = 1

      for index2 = 0 to words
            if index1 != to index2 AND wordCount[index1] equals
      wordCount[index2] then
                  wordFound = false

                  for letter = 0 to wordCount[index1]
                        if stack[index1][letter] equals
      stack[index2][letter] then
                              wordFound = true
                        else
                              wordFound = false
                              break
                        endif
                  endfor
                  if wordFound then
                        occurrences++
                  endif
            endif
      endfor
end
```

2.

3. Data Structures

- Array
- 2D Array

4.

```
idrie@IdriesDesktop MINGW64 ~/Desktop/UNI/CSCI203/Assignment1
$ g++ main.cpp -o main

idrie@IdriesDesktop MINGW64 ~/Desktop/UNI/CSCI203/Assignment1
$ ./main
Please enter the name of the input file: sample-short.txt
First 10 Words:

bandersnatch: 12
snickersnack: 12
jabberwocky: 11
galumphing: 10
jabberwock: 10
jabberwock: 10
jabberwock: 10
borogoves: 9
borogoves: 9
whiffling: 9

Last 10 Words:

in: 2
it: 2
it: 2
my: 2
my: 2
my: 2
of: 2
so: 2
to: 2
o: 1
```

```
Unique Words:

bandersnatch
snickersnack
jabberwocky
galumphing
whiffling
chortled
frabjous
frumious
beamish
burbled
callooh
manxome
awhile
callay
carrol
jubjub
rested
sought
tulgey
tumtum
uffish
blade
catch
claws
flame
lewis
slain
sword
back
bird
bite
come
dead
eyes
hand
hast
head
jaws
left
long
shun
```

```
thou
time
took
tree
wood
arm
boy
day
foe
its
joy
son
by
of
so
to
o
```

5.

```
Please enter the name of the input file: sample-long.txt
First 10 Words:

wwwgutenbergorg: 15
circumspection: 14
overscrupulous: 14
threeandtwenty: 14
acquaintances: 13
consideration: 13
distinguished: 13
establishment: 13
extraordinary: 13
gentlemanlike: 13

Last 10 Words:

i: 1
i: 1
i: 1
i: 1
```

```
i: 1
i: 1
i: 1
: 0
: 0
: 0

Unique Words:

wwwgutenbergorg
circumspection
overscrupulous
threeandtwenty
acquaintances
consideration
distinguished
establishment
extraordinary
gentlemanlike
hertfordshire
insupportable
understanding
accomplished
acknowledged
altogethermr
ascertaining
astonishment
brotherinlaw
conjecturing
consequently
conversation
disappointed
disconcerted
discontented
exaggeration
expectations
goodhumoured
housekeeping
hypocritical
insufficient
intelligence
introduction
occasionally
```

particularly
restrictions
satisfactory
suppositions
circulation
consequence
determining
disposition
excessively
exclamation
goodlooking
immediately
information
inhabitants
interrupted
resentfully
surrounding
universally
wonderfully
admiration
afterwards
altogether
assemblies
assistance
bitterness
considered
derbyshire
determined
discovered
discretion
dispatched
experience
fastidious
favourable
forbidding
fortnights
michaelmas
particular
pleasantly
popularity
preference
pronounced
punishment

reflection
regardless
resentment
ridiculous
secondhand
sufficient
surpassing
unaffected
uncommonly
understand
unreserved
whatsoever
addressed
adjusting
amusement
attention
barefaced
behaviour
boulanger
catherine
comforted
conceited
consisted
continued
curiosity
different
difficult
disclosed
extremely
fretfully
gentleman
gratified
handsomer
ingenious
knowledge
londonhis
longbourn
mentioned
neighbour
newcomers
objection
observing
protested

qualities
questions
quickness
recommend
sarcastic
sharpened
tolerable
uncertain
whichever
admitted
anywhere
assuring
attacked
bingleys
catching
charming
children
compared
contrast
coughing
declared
declined
deferred
earliest
emphatic
employed
enduring
enquired
entering
entrance
expected
extracts
families
fancying
fatigued
features
ignorant
included
intended
persuade
pleasing
pleasure
promised

property
proudest
raptures
remained
rightful
rudeness
scarcity
scolding
sensible
servants
setdowns
settling
shocking
somebody
somewhat
speaking
splendid
sprained
starting
stranger
suddenly
surmises
tiresome
tomorrow
trimming
unworthy
visiting
wayswith
withdrew
yourself
account
already
amiable
amongst
arrival
arrived
believe
brought
caprice
certain
chooses
company
consent

contain
cordial
country
courses
declare
decline
deigned
delight
develop
disgust
dislike
distant
dresses
elegant
engaged
england
equally
falling
fancied
fashion
flatter
grieved
grownup
happily
heavens
imagine
instead
kingdom
library
license
looking
meaning
mention
mistake
mixture
neglect
nervous
opinion
planned
playful
pretend
quieted
quieter

related
reserve
respect
selfish
serving
several
sitting
spirits
stoutly
suiting
tallest
teasing
thought
towards
turning
unlucky
various
venture
village
violent
walking
wasting
without
admire
advice
affect
afraid
agreed
almost
amends
anyone
author
beheld
behind
branch
called
chaise
chance
choose
closed
coldly
coughs
cousin

credit
dances
desire
during
either
eluded
engage
escape
estate
family
figure
finery
flying
forget
fourth
hearty
highly
horrid
hursts
learnt
likely
london
making
matter
moment
monday
morris
nobody
number
office
online
passed
people
person
pieces
raised
rather
really
seemed
smiles
solace
stared
stress

struck
stupid
suffer
surely
talked
temper
toward
tumult
turned
unless
vexing
waited
window
within
abuse
added
agree
angry
ankle
black
books
bring
cases
check
crown
early
enjoy
event
fancy
fears
fifth
fixed
forms
given
going
heart
horse
house
ideas
janes
least
likes
lines

lived
loved
mamma
maria
meant
might
minds
noble
north
often
press
proud
quick
reply
reuse
round
sakes
seven
share
sight
silly
sixth
skill
sorry
speak
spoke
tempt
terms
these
third
those
throw
times
title
under
upper
using
vexed
wifes
worth
away
back
best

```
blue
book
care
coat
copy
cost
days
deal
deep
dont
door
draw
drew
easy
else
fall
fear
felt
find
fond
gave
gods
gown
hate
idea
join
joke
keep
king
lace
laid
laws
left
less
live
lose
meet
mien
mind
name
near
news
none
```

```
park
part
poor
read
rode
save
says
seek
seen
shut
sick
step
talk
tall
tear
tide
week
whom
wore
act
air
aye
bit
etc
eye
got
hat
ill
its
joy
met
new
nor
odd
old
out
sat
sit
six
yet
ah
im
```