

Lab Assignment 14 (03/03/2023)
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Tasks:

Develop source program with functions for power iteration, shifted inverse power iteration and Rayleigh quotient iteration, and test these functions with examples. Submit both source codes and screenshots.

1. Use Makefile. Submit source codes and screenshots.
2. Push the code to GitHub.
3. File transfer and Up-to-date in Nova cluster

Submission Files and Results:

1. Screenshot

```
gcc main.c -lm -o main.exe
(base) ubuntu@ubuntu-vm:~/Documents/chandanaWorkspace/CPRE 525 Spring 2023/CPRE525Spring2023/13. Lab Assignment 14/matrix$ ./main.exe
e
L =
| 2.000e+00, 1.000e+00, 1.000e+00 |
| 4.000e+00, 3.000e+00, 2.000e+00 |
| 5.000e+00, 5.000e+00, 4.000e+00 |

L_Transpose =
| 2.000e+00, 4.000e+00, 5.000e+00 |
| 1.000e+00, 3.000e+00, 5.000e+00 |
| 1.000e+00, 2.000e+00, 4.000e+00 |

A =
| 6.000e+00, 1.300e+01, 1.900e+01 |
| 1.300e+01, 2.900e+01, 4.300e+01 |
| 1.900e+01, 4.300e+01, 6.600e+01 |

v =
| 1.000e+00, 1.000e+00, 1.000e+00 |^T

Maximum number of Iterations for solving eigen value for A by Rayleigh Quotient Iteration is 2
[power_iteration] The largest eigen value (Lambda) for A is 99.95

Maximum number of Iterations for solving eigen value for A by Shifted Inverse Power Iteration is 2
[shiftedInverse_power_iteration] The eigen value (Lambda) close to mu (100) for A is 99.9503770644

Maximum number of Iterations for solving eigen value for A by Rayleigh Quotient Iteration is 1
[RayleighQuotient_iteration] The eigen value (Lambda) for A is 99.9503796212
```

2. Push the code to GitHub
 - a. Git status check

```
(base) ubuntu@ubuntu-vm:~/Documents/chandanaWorkspace/CPRE 525 Spring 2023/CPRE525Spring2023$ git status
On branch main
Your branch is up to date with 'origin/main'.

Untracked files:
  (use "git add <file>..." to include in what will be committed)
    12. Lab Assignment 13/12. Lab Assignment 13 Submission.pdf
    13. Lab Assignment 14/

nothing added to commit but untracked files present (use "git add" to track)
```

b. Git add and git status

```
(base) ubuntu@ubuntu-vm:~/Documents/chandanaWorkspace/CPRE 525 Spring 2023/CPRE525Spring2023$ git add .
(base) ubuntu@ubuntu-vm:~/Documents/chandanaWorkspace/CPRE 525 Spring 2023/CPRE525Spring2023$ git status
On branch main
Your branch is up to date with 'origin/main'.

Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
    new file:   12. Lab Assignment 13/12. Lab Assignment 13 Submission.pdf
    new file:   13. Lab Assignment 14/matrix/Makefile
    new file:   13. Lab Assignment 14/matrix/main.c
    new file:   13. Lab Assignment 14/matrix/main.exe
    new file:   13. Lab Assignment 14/matrix/main.o
    new file:   13. Lab Assignment 14/matrix/matrix.c
    new file:   13. Lab Assignment 14/matrix/matrix.h
    new file:   13. Lab Assignment 14/matrix/matrix.o
```

c. Git committed the files

```
(base) ubuntu@ubuntu-vm:~/Documents/chandanaWorkspace/CPRE 525 Spring 2023/CPRE525Spring2023$ git commit -m "Adding Files"
[main 90b4577] Adding Files
 8 files changed, 827 insertions(+)
 create mode 100644 12. Lab Assignment 13/12. Lab Assignment 13 Submission.pdf
 create mode 100644 13. Lab Assignment 14/matrix/Makefile
 create mode 100644 13. Lab Assignment 14/matrix/main.c
 create mode 100755 13. Lab Assignment 14/matrix/main.exe
 create mode 100644 13. Lab Assignment 14/matrix/main.o
 create mode 100644 13. Lab Assignment 14/matrix/matrix.c
 create mode 100644 13. Lab Assignment 14/matrix/matrix.h
 create mode 100644 13. Lab Assignment 14/matrix/matrix.o
```

d. Git push

```
(base) ubuntu@ubuntu-vm:~/Documents/chandanaWorkspace/CPRE 525 Spring 2023/CPRE525Spring2023$ git push
Username for 'https://github.com': Saichandana999
Password for 'https://Saichandana999@github.com':
Enumerating objects: 15, done.
Counting objects: 100% (15/15), done.
Delta compression using up to 8 threads
Compressing objects: 100% (12/12), done.
Writing objects: 100% (13/13), 800.97 KiB | 12.92 MiB/s, done.
Total 13 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/Saichandana999/CPRE525Spring2023.git
 2252d73..90b4577 main -> main
```

e. Final GitHub repository

Saichandana999 / CPRES25Spring2023 Private

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main 1 branch 0 tags Go to file Add file + Code +

Saichandana999 Adding Files 92b4317 1 minute ago 16 commits

.vscode	Adding Files	3 weeks ago
1. Lab Assignment 2	Adding my files	2 months ago
10. lab Assignment 11	Adding Files	last week
11. Lab Assignment 12	Adding Files	3 days ago
12. Lab Assignment 13	Adding Files	1 minute ago
13. Lab Assignment 14matrix	Adding Files	1 minute ago
2. Lab Assignment 3	Adding my files	2 months ago
3. Lab Assignment 4	Adding Files	3 weeks ago
4. Lab Assignment 5	5. Lab Assignment 6	last month
5. Lab Assignment 6	Adding files	last month
6. Lab Assignment 7	Adding Files	3 weeks ago
7. Lab Assignment 8	Adding Files	3 weeks ago
8. Lab Assignment 9	Adding Files	2 weeks ago
9. lab Assignment 10	Adding Files	2 weeks ago
LICENSE	Initial commit	2 months ago
README.md	Initial commit	2 months ago

3. Files transferred and up-to-date in Nova cluster.
<Unable to connect to Nova. I will update it later>