

Octave on HPC

What is Octave?

GNU Octave is a free and open-source numerical computing software package that is compatible with MATLAB. It is used for data analysis, simulation, and visualization, and supports a wide range of data types, including matrices and complex numbers. Octave also has a large library of built-in mathematical functions, as well as an extensive package ecosystem for additional functionality. The software can be used through a command-line interface or with a graphical user interface (GUI). It is widely used in education, research, and industry.

Links:

[Official Website](#)

Versions Available:

The following versions are available on the cluster:

- Octave

How to load Octave?

To load Octave, use the following commands:

```
#Load the Octave module  
module load octave
```

If users want to install octave in own environment, use the following command to create conda environment,

```
# Load miniconda module
module load miniconda3/base

#Create environment
conda create --name octaveENV -c conda-forge octave -y

#Activate environment
conda activate octaveENV
```

How to use Octave?

To demonstrate the usage of octave, use the following code to find the roots of equation using octave,

```
# Octave script to find roots of a quadratic equation

# define the coefficients of the equation
a = 1;
b = -3;
c = 2;

# calculate the discriminant
d = b^2 - 4*a*c;

# check the nature of roots
if (d > 0)
    # real and distinct roots
    root1 = (-b + sqrt(d)) / (2*a);
    root2 = (-b - sqrt(d)) / (2*a);
    printf("The roots are %f and %f\n", root1, root2);
elseif (d == 0)
    # real and equal roots
    root1 = -b / (2*a);
    printf("The roots are %f and %f\n", root1, root1);
else
    # complex roots
    real = -b / (2*a);
    imag = sqrt(-d) / (2*a);
```

```
printf("The roots are %f + %fi and %f - %fi\n", real, imag, real,
imag);
endif
```

Copy and paste the script in an octave_script.m file.

To use octave, jump to a compute node using the following command,

```
# Jump to compute node
srun -p main --qos main -n 1 -c 16 --mem 16G --pty bash
```

Now run the octave command,

```
# run octave after loading module or activating environment
octave octave_script.m
```

Octave also have a GUI. To use a GUI interface, login to HPC using X11 forwarding.

```
# Login using X11
ssh -X bigal@uahpc.ua.edu
```

Use this command to directly launch octave GUI into compute node,

```
# Launch octave into compute node
srun -p main --qos main -n 1 -c 16 --mem 16G --pty octave --gui
```

Where to find help?

If you are confused or need help at any point, please contact OIT at the following address.

<https://ua-app01.ua.edu/researchComputingPortal/public/oitHelp>

