Valgrind on HPC

What is Valgrind?

Valgrind is a GPL'd system for debugging and profiling Linux programs. With Valgrind's tool suite you can automatically detect many memory management and threading bugs, avoiding hours of frustrating bug-hunting, making your programs more stable. You can also perform detailed profiling to help speed up your programs. Valgrind has been used on programs written partly or entirely in **C, C++, Java, Perl, Python, assembly code, Fortran, Ada,** and many others.[source]

Links:

Official Website

Documentation

Versions Available:

The following versions are available on the cluster:

- valgrind/3.10

How to load Valgrind?

To load Valgrind, use the following commands:

```
#Load the Valgrind module
module load valgrind/3.10
```

To verify if the module and dependencies are loaded correctly, use the following command.

```
#Show all the modules loaded
module list
```

This should list all the software and dependencies that are loaded. In this case, only valgrind will be loaded since this is standalone library.

How to use Valgrind?

For this tutorial, use the following C code as reference to use the valgrind,

```
#include <stdlib.h>

void f(void) {
int* x = malloc(10 * sizeof(int));

x[10] = 0; // problem 1: heap block overrun

// problem 2: memory leak -- x not freed
}

 int main(void) {
      f();
      return 0;
}
```

Create a test.c file and paste the following code.

Use the following command to compile,

```
#Compile the program
gcc test.cpp -o test.out
```

Use the following command to run valgrind check on the compiled code,

```
# Use valgrind to detect leak and errors
valgrind --leak-check=yes ./test.out
```

The summary should be printed in stdout. To check for more commands and usage, refer to the documentation on the official website.

Where to find help?

If you are stuck on some part or need help at any point, please contact OIT at the following address.

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