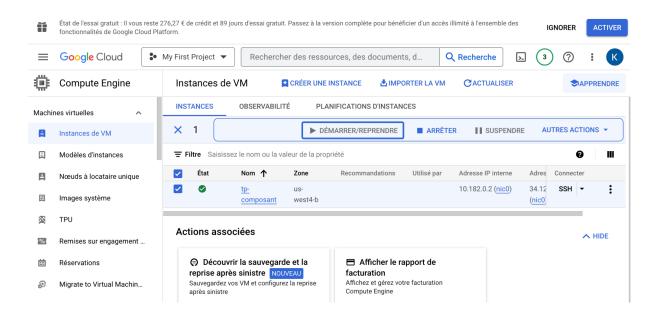# Rapport programmation par composant

Dans le cadre du cours programmation par composant, nous avons instancié une machine virtuelle sur google cloud pour pouvoir exécuter les différents programmes.

Nous avons cloné le répertoire git et installé les commandes nécessaires pour la compilation.

```
Processing triggers for man-db (2.9.4-2) ...
Processing triggers for libc-bin (2.31-13+deb11u5) ...
koundambengue@tp-composant:~$ git clone https://github.com/Kounda/lib_partageable_2023.git
Cloning into 'lib_partageable_2023'...
remote: Enumerating objects: 37, done.
remote: Counting objects: 100% (37/37), done.
remote: Compressing objects: 100% (25/25), done.
Receiving objects: 100% (37/37), 7.00 KiB | 3.50 MiB/s, done.
remote: Total 37 (delta 9), reused 37 (delta 9), pack-reused 0
Resolving deltas: 100% (9/9), done.
```

La commande make, pour la compilation des fichiers sources :

```
koundambengue@tp-composant:~/lib_partageable_2023$ make
cd main && make install
make[1]: Entering directory '/home/koundambengue/lib_partageable_2023/main'
mkdir ../bin
for component in Composant1 Composant2; do \
        cd ../$component; \
        make install;  \
done
make[2]: Entering directory '/home/koundambengue/lib_partageable_2023/Composant1'
mkdir -p ../lib
g++ -fPIC -I../interfaces -c Composant1.cpp -o Composant1.o
gcc -o libComposant1.so -shared  Composant1.o
cp libComposant1.so ../lib/libComposant1.so
make[2]: Leaving directory '/home/koundambengue/lib_partageable_2023/Composant1'
make[2]: Entering directory '/home/koundambengue/lib_partageable_2023/Composant2'
g++ -fPIC -I../interfaces -c Composant2.cpp -o Composant2.o
gcc -o libComposant2.so -shared  Composant2.o
cp libComposant2.so ../lib/libComposant2.so
make[2]: Leaving directory '/home/koundambengue/lib_partageable_2023/Composant2'
g++ -fPIC -I../interfaces -c main.cpp -o main.o
g++ main.o -L ../lib -lComposant1 -lComposant2 -o main
cp main ../bin; \
cp ../lib/libComposant1.so ../lib/libComposant2.so ../bin
make[1]: Leaving directory '/home/koundambengue/lib_partageable_2023/main'
cd bin; \
LD_LIBRARY_PATH=. ./main
Composant 1 version 1.2.2.0
valeur 1 :8 valeur 2 :15
koundambengue@tp-composant:~/lib_partageable_2023$ '
```

Test de objdump −T main

```
koundambengue@tp-composant:~/lib_partageable_2023/main$ objdump -T main

main:     file format elf64-x86-64

DYNAMIC SYMBOL TABLE:
0000000000000000      DF *UND*  0000000000000000  GLIBCXX_3.4 _ZSt4endlIcSt11char_traitsIcEERSt13basic_ostreamI
T_T0_ES6_
0000000000000000      DF *UND*  0000000000000000              _Z10composant2ii
0000000000000000      DF *UND*  0000000000000000              _Z10composant1ii
0000000000000000      DF *UND*  0000000000000000              _Z20getComposant1Versionv
0000000000000000      DF *UND*  0000000000000000  GLIBC_2.2.5 __cxa_atexit
0000000000000000      DF *UND*  0000000000000000  GLIBCXX_3.4 _ZStlsISt11char_traitsIcEERSt13basic_ostreamIcT_E
S5_PKc
0000000000000000      DF *UND*  0000000000000000  GLIBCXX_3.4 _ZNSolsEPFRSoS_E
0000000000000000      DO *UND*  0000000000000000  GLIBCXX_3.4 _ZSt4cout
0000000000000000      DF *UND*  0000000000000000  GLIBCXX_3.4 _ZNSt8ios_base4InitC1Ev
0000000000000000      DF *UND*  0000000000000000  GLIBCXX_3.4 _ZNSolsEi
0000000000000000  w   D  *UND*  0000000000000000              _ITM_deregisterTMCloneTable
0000000000000000      DF *UND*  0000000000000000  GLIBC_2.2.5 __libc_start_main
0000000000000000  w   D  *UND*  0000000000000000              __gmon_start__
0000000000000000  w   D  *UND*  0000000000000000              _ITM_registerTMCloneTable
0000000000000000      DF *UND*  0000000000000000  GLIBCXX_3.4 _ZNSt8ios_base4InitD1Ev
0000000000000000  w   DF *UND*  0000000000000000  GLIBC_2.2.5 __cxa_finalize


koundambengue@tp-composant:~/lib_partageable_2023/main$ '''
```

Test objdump –T libComposant1.so

```
koundambengue@tp-composant:~/lib_partageable_2023/main$ cd /home/koundambengue/lib_partageable_2023/Composant1
koundambengue@tp-composant:~/lib_partageable_2023/Composant1$ objdump -T libComposant1.so

libComposant1.so:     file format elf64-x86-64

DYNAMIC SYMBOL TABLE:
0000000000000000  w   D  *UND*  0000000000000000 __cxa_finalize
0000000000000000  w   D  *UND*  0000000000000000 _ITM_registerTMCloneTable
0000000000000000  w   D  *UND*  0000000000000000 _ITM_deregisterTMCloneTable
0000000000000000  w   D  *UND*  0000000000000000 __gmon_start__
0000000000001138 g    DF .text  000000000000000d _Z20getComposant1Versionv
0000000000001124 g    DF .text  0000000000000014 _Z16addition_interneii
0000000000001105 g    DF .text  000000000000001f _Z10composant1ii
```

Test objdump –C –T libComposant1.so

```
                                  Display this information
koundambengue@tp-composant:~/lib_partageable_2023/Composant1$ objdump -C -T libComposant1.so

libComposant1.so:     file format elf64-x86-64

DYNAMIC SYMBOL TABLE:
0000000000000000  w   D  *UND*  0000000000000000 __cxa_finalize
0000000000000000  w   D  *UND*  0000000000000000 _ITM_registerTMCloneTable
0000000000000000  w   D  *UND*  0000000000000000 _ITM_deregisterTMCloneTable
0000000000000000  w   D  *UND*  0000000000000000 __gmon_start__
0000000000001138 g    DF .text  000000000000000d getComposant1Version()
0000000000001124 g    DF .text  0000000000000014 addition_interne(int, int)
0000000000001105 g    DF .text  000000000000001f composant1(int, int)
```

Test objdump –T libComposant2.so

```
koundambengue@tp-composant:~/lib_partageable_2023/Composant2$ objdump -T libComposant2.so

libComposant2.so:     file format elf64-x86-64

DYNAMIC SYMBOL TABLE:
0000000000000000  w   D  *UND*  0000000000000000 __cxa_finalize
0000000000000000  w   D  *UND*  0000000000000000 _ITM_registerTMCloneTable
0000000000000000  w   D  *UND*  0000000000000000 _ITM_deregisterTMCloneTable
0000000000000000  w   D  *UND*  0000000000000000 __gmon_start__
00000000000010f5 g    DF .text  0000000000000013 _Z10composant2ii
```

Test objdump –C –T libComposant2.so

```
koundambengue@tp-composant:~/lib_partageable_2023/Composant1$ cd /home/koundambengue/lib_partageable_2023/Composant2
koundambengue@tp-composant:~/lib_partageable_2023/Composant2$ objdump -T libComposant2.so

libComposant2.so:     file format elf64-x86-64

DYNAMIC SYMBOL TABLE:
0000000000000000  w   D  *UND*  0000000000000000 __cxa_finalize
0000000000000000  w   D  *UND*  0000000000000000 _ITM_registerTMCloneTable
0000000000000000  w   D  *UND*  0000000000000000 _ITM_deregisterTMCloneTable
0000000000000000  w   D  *UND*  0000000000000000 __gmon_start__
00000000000010f5 g    DF .text  0000000000000013 _Z10composant2ii
```

A présent, nous allons décommenter les lignes extern "C"

Voici ce que nous avons en sorti :

```
koundambengue@tp-composant:~/lib_partageable_2023$ make
cd main && make install
make[1]: Entering directory '/home/koundambengue/lib_partageable_2023/main'
cp main ../bin; \
cp ../lib/libComposant1.so ../lib/libComposant2.so ../bin
make[1]: Leaving directory '/home/koundambengue/lib_partageable_2023/main'
cd bin; \
LD_LIBRARY_PATH=. ./main
Composant 1 version 1.2.2.0
valeur 1 :8 valeur 2 :15
```

Test objdump -T main

```
koundambengue@tp-composant:~/lib_partageable_2023/main$ objdump -T main

main:     file format elf64-x86-64

DYNAMIC SYMBOL TABLE:
0000000000000000      DF *UND*  0000000000000000  GLIBCXX_3.4 _ZSt4endlIcSt11char_traitsIcEERSt13basic_ostreamI
T_T0_ES6_
0000000000000000      DF *UND*  0000000000000000              _Z10composant2ii
0000000000000000      DF *UND*  0000000000000000              _Z10composant1ii
0000000000000000      DF *UND*  0000000000000000              _Z20getComposant1Versionv
0000000000000000      DF *UND*  0000000000000000  GLIBC_2.2.5 __cxa_atexit
0000000000000000      DF *UND*  0000000000000000  GLIBCXX_3.4 _ZStlsISt11char_traitsIcEERSt13basic_ostreamIcT_E
S5_PKc
0000000000000000      DF *UND*  0000000000000000  GLIBCXX_3.4 _ZNSolsEPFRSoS_E
0000000000000000      DO *UND*  0000000000000000  GLIBCXX_3.4 _ZSt4cout
0000000000000000      DF *UND*  0000000000000000  GLIBCXX_3.4 _ZNSt8ios_base4InitC1Ev
0000000000000000      DF *UND*  0000000000000000  GLIBCXX_3.4 _ZNSolsEi
0000000000000000  w   D  *UND*  0000000000000000              _ITM_deregisterTMCloneTable
0000000000000000      DF *UND*  0000000000000000  GLIBC_2.2.5 __libc_start_main
0000000000000000  w   D  *UND*  0000000000000000              __gmon_start__
0000000000000000  w   D  *UND*  0000000000000000              _ITM_registerTMCloneTable
0000000000000000      DF *UND*  0000000000000000  GLIBCXX_3.4 _ZNSt8ios_base4InitD1Ev
0000000000000000  w   DF *UND*  0000000000000000  GLIBC_2.2.5 __cxa_finalize
```

Test objdump -C -T main

```
koundambengue@tp-composant:~/lib_partageable_2023/main$ objdump -C -T main

main:     file format elf64-x86-64

DYNAMIC SYMBOL TABLE:
0000000000000000      DF *UND*  0000000000000000  GLIBCXX_3.4 std::basic_ostream<char, std::char_traits<char> >
& std::endl<char, std::char_traits<char> >(std::basic_ostream<char, std::char_traits<char> >&)
0000000000000000      DF *UND*  0000000000000000              composant2(int, int)
0000000000000000      DF *UND*  0000000000000000              composant1(int, int)
0000000000000000      DF *UND*  0000000000000000              getComposant1Version()
0000000000000000      DF *UND*  0000000000000000  GLIBC_2.2.5 __cxa_atexit
0000000000000000      DF *UND*  0000000000000000  GLIBCXX_3.4 std::basic_ostream<char, std::char_traits<char> >
& std::operator<< <std::char_traits<char> >(std::basic_ostream<char, std::char_traits<char> >&, char const*)
0000000000000000      DF *UND*  0000000000000000  GLIBCXX_3.4 std::ostream::operator<<(std::ostream& (*)(std::o
stream&))
0000000000000000      DO *UND*  0000000000000000  GLIBCXX_3.4 std::cout
0000000000000000      DF *UND*  0000000000000000  GLIBCXX_3.4 std::ios_base::Init::Init()
0000000000000000      DF *UND*  0000000000000000  GLIBCXX_3.4 std::ostream::operator<<(int)
0000000000000000  w   D  *UND*  0000000000000000              _ITM_deregisterTMCloneTable
0000000000000000      DF *UND*  0000000000000000  GLIBC_2.2.5 __libc_start_main
0000000000000000  w   D  *UND*  0000000000000000              __gmon_start__
0000000000000000  w   D  *UND*  0000000000000000              _ITM_registerTMCloneTable
0000000000000000      DF *UND*  0000000000000000  GLIBCXX_3.4 std::ios_base::Init::~Init()
0000000000000000  w   DF *UND*  0000000000000000  GLIBC_2.2.5 __cxa_finalize
```

Test objdump –T libComposant1.so

```
valeur 1 :8 valeur 2 :15
koundambengue@tp-composant:~/lib_partageable_2023$ cd Composant1
koundambengue@tp-composant:~/lib_partageable_2023/Composant1$ objdump -T libComposant1.so

libComposant1.so:     file format elf64-x86-64

DYNAMIC SYMBOL TABLE:
0000000000000000  w   D  *UND*  0000000000000000 __cxa_finalize
0000000000000000  w   D  *UND*  0000000000000000 _ITM_registerTMCloneTable
0000000000000000  w   D  *UND*  0000000000000000 _ITM_deregisterTMCloneTable
0000000000000000  w   D  *UND*  0000000000000000 __gmon_start__
0000000000001138 g    DF .text  000000000000000d _Z20getComposant1Versionv
0000000000001124 g    DF .text  0000000000000014 _Z16addition_interneii
0000000000001105 g    DF .text  000000000000001f _Z10composant1ii
```

Test objdump –C –T libComposant1.so

```
koundambengue@tp-composant:~/lib_partageable_2023/Composant1$ objdump -C -T libComposant1.so

libComposant1.so:     file format elf64-x86-64

DYNAMIC SYMBOL TABLE:
0000000000000000  w   D  *UND*  0000000000000000 __cxa_finalize
0000000000000000  w   D  *UND*  0000000000000000 _ITM_registerTMCloneTable
0000000000000000  w   D  *UND*  0000000000000000 _ITM_deregisterTMCloneTable
0000000000000000  w   D  *UND*  0000000000000000 __gmon_start__
0000000000001138 g    DF .text  000000000000000d getComposant1Version()
0000000000001124 g    DF .text  0000000000000014 addition_interne(int, int)
0000000000001105 g    DF .text  000000000000001f composant1(int, int)
```