project ch9

Programming Project for Ch.9*: Contiguous Memory Allocation In Section 9.2, we presented different algorithms for contiguous memory allocation. This project will involve managing a contiguous region of memory of size MAX where addresses may range from 0 ... MAX− 1. Your program must respond to four different requests:

1. Request for a contiguous block of memory
2. Release of a contiguous block of memory
3. Compact unused holes of memory into one single block
4. Report the regions of free and allocated memory
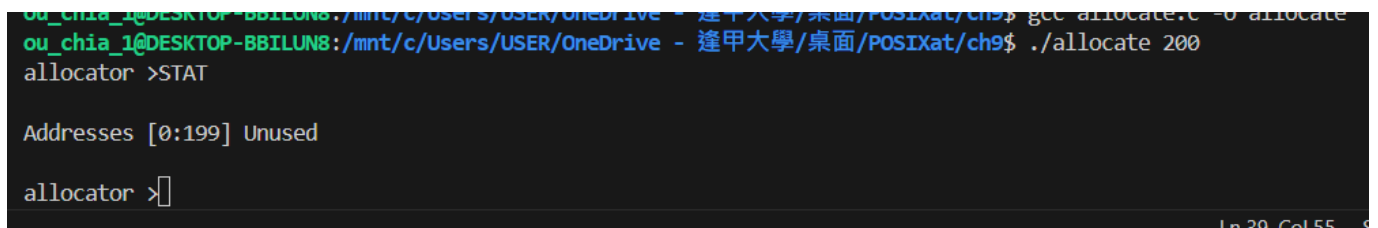
Your program will be passed the initial amount of memory at startup

compile

```
gcc allocate.c -o allocate
```

run

```
./allocate <init memory>
```

```
ou_chia_1@DESKTOP-BBILUN8:/mnt/c/Users/USER/OneDrive - 逢甲大學/桌面/POSIXat/ch9$ gcc allocate.c -o allocate
ou_chia_1@DESKTOP-BBILUN8:/mnt/c/Users/USER/OneDrive - 逢甲大學/桌面/POSIXat/ch9$ ./allocate 200
allocator >STAT

Addresses [0:199] Unused

allocator >
                                                                                      Ln 39 Col 55
```

Once your program has started, it will present the user with the following prompt:

```
allocator>
```

It will then respond to the following commands: RQ (request), RL (release), C (compact), STAT (status report), and X (exit). A request for 40,000 bytes will appear as follows:

```
allocator>RQ <process> <request memory number> <way>
```

- F — first fit

```
Addresses [0:99] Process P1
Addresses [100:100] Process P3
Addresses [101:102] Unused
Addresses [103:117] Process P5
Addresses [118:118] Process P7
Addresses [119:199] Unused

allocator >RQ P4 1 F
allocator >STAT

Addresses [0:99] Process P1
Addresses [100:100] Process P3
Addresses [101:101] Process P4
Addresses [102:102] Unused
Addresses [103:117] Process P5
Addresses [118:118] Process P7
Addresses [119:199] Unused
```

- B — best fit

```
Addresses [0:99] Process P1
Addresses [100:117] Unused
Addresses [118:118] Process P7
Addresses [119:199] Unused

allocator >RQ P3 5 B
allocator >STAT

Addresses [0:99] Process P1
Addresses [100:104] Process P3
Addresses [105:117] Unused
Addresses [118:118] Process P7
Addresses [119:199] Unused
```

- W — worst fit

```
Addresses [0:99] Process P1
Addresses [100:104] Process P3
Addresses [105:117] Unused
Addresses [118:118] Process P7
Addresses [119:199] Unused          3 / 5

allocator >RQ P2 11 W
allocator >STAT

Addresses [0:99] Process P1
Addresses [100:104] Process P3
Addresses [105:117] Unused
Addresses [118:118] Process P7
Addresses [119:129] Process P2
Addresses [130:199] Unused

allocator >
```

The first parameter to the RQ command is the new process that requires the memory, followed by the amount of memory being requested, and finally the strategy. (In this situation, "W" refers to worst fit.)

```
allocator>RL <release process>
```

```
Addresses [0:99] Process P1
Addresses [100:104] Process P3
Addresses [105:105] Process P7
Addresses [106:116] Process P2
Addresses [117:199] Unused

allocator >RL P3
allocator >STAT

Addresses [0:99] Process P1
Addresses [100:104] Unused
Addresses [105:105] Process P7
Addresses [106:116] Process P2
Addresses [117:199] Unused

allocator >
```

This command will release the memory that has been allocated to process P0. The command for compaction is entered as:

```
    allocator>C
```

```
Addresses [0:99] Process P1
Addresses [100:104] Process P3
Addresses [105:117] Unused
Addresses [118:118] Process P7
Addresses [119:129] Process P2
Addresses [130:199] Unused

allocator >C
allocator >STAT

Addresses [0:99] Process P1
Addresses [100:104] Process P3
Addresses [105:105] Process P7
Addresses [106:116] Process P2
Addresses [117:199] Unused
```

This command will compact unused holes of memory into one region. Finally, the STAT command for reporting the status of memory is entered as:

```
    allocator>STAT
```

```
allocator >C
allocator >STAT

Addresses [0:19] Unused
Addresses [20:35] Process P1
Addresses [36:199] Unused

allocator >
```

exit

```
    allocator>X
```

```
Addresses [0:19] Unused
Addresses [20:35] Process P1
Addresses [36:199] Unused

allocator >X
ou_chia_1@DESKTOP-BBILUN8:/mnt/c/Users/USER/OneDrive - 逢甲大學/桌面/POSIXat/ch9$
```