Question 1:

```
zaineb@Zaineb:/mnt/c/Users/zaine/Downloads/SYSC 4001/SYSC4001_A2_P2/SYSC4001_A2_P2$ gcc Part2.1.c -o part2.1;
zaineb@Zaineb:/mnt/c/Users/zaine/Downloads/SYSC 4001/SYSC4001_A2_P2/SYSC4001_A2_P2$ ./part2.1;
parent: pid = 6006
parent: pid1 = 6005
child: pid = 0
child: pid1 = 6006
parent: pid = 6006
parent: pid1 = 6005
child: pid = 0
child: pid1 = 6006
child: pid = 0
child: pid1 = 6006
parent: pid = 6006
parent: pid1 = 6005
child: pid = 0
child: pid1 = 6006
parent: pid = 6006
parent: pid1 = 6005
parent: pid = 6006
child: pid = 0
child: pid1 = 6006
parent: pid1 = 6005
parent: pid = 6006
parent: pid1 = 6005
child: pid = 0
child: pid1 = 6006
parent: pid = 6006
parent: pid1 = 6005
child: pid = 0
child: pid1 = 6006
```

Question 2:

```
zaineb@Zaineb:/mnt/c/Users/zaine/Downloads/SYSC 4001/SYSC4001_A2_P2/SYSC4001_A2_P2$ gcc Part2.2_process1.c -o part2.2_process1;
zaineb@Zaineb:/mnt/c/Users/zaine/Downloads/SYSC 4001/SYSC4001_A2_P2/SYSC4001_A2_P2$ gcc Part2.2_process2.c -o part2.2_process2;
zaineb@Zaineb:/mnt/c/Users/zaine/Downloads/SYSC 4001/SYSC4001_A2_P2/SYSC4001_A2_P2$ ./part2.2_process1;
Process 1 Cycle number: 1
Process 2 Cycle number: -1
Process 1 Cycle number: 2
Process 2 Cycle number: -2
Process 1 Cycle number: 3 - 3 is a multiple of 3
Process 2 Cycle number: -3 - -3 is a multiple of 3
Process 1 Cycle number: 4
Process 2 Cycle number: -4
Process 1 Cycle number: 5
Process 2 Cycle number: -5
Process 1 Cycle number: 6 - 6 is a multiple of 3
Process 2 Cycle number: -6 - -6 is a multiple of 3
Process 1 Cycle number: 7
Process 2 Cycle number: -7
Process 1 Cycle number: 8
Process 2 Cycle number: -8
Process 1 Cycle number: 9 - 9 is a multiple of 3
Process 2 Cycle number: -9 - -9 is a multiple of 3
Process 1 Cycle number: 10
Process 2 Cycle number: -10
Process 1 Cycle number: 11
Process 2 Cycle number: -11
Process 1 Cycle number: 12 - 12 is a multiple of 3
Process 2 Cycle number: -12 - -12 is a multiple of 3
Process 1 Cycle number: 13
Process 2 Cycle number: -13
Process 1 Cycle number: 14
Process 2 Cycle number: -14
Process 1 Cycle number: 15 - 15 is a multiple of 3
Process 2 Cycle number: -15 - -15 is a multiple of 3
Process 1 Cycle number: 16
Process 2 Cycle number: -16
Process 1 Cycle number: 17
Process 2 Cycle number: -17
Process 1 Cycle number: 18 - 18 is a multiple of 3
Process 2 Cycle number: -18 - -18 is a multiple of 3
Process 1 Cycle number: 19
Process 2 Cycle number: -19
Process 1 Cycle number: 20
Process 2 Cycle number: -20
Process 1 Cycle number: 21 - 21 is a multiple of 3
Process 2 Cycle number: -21 - -21 is a multiple of 3
```

Question 3:

Initial

```
zaineb@Zaineb:/mnt/c/Users/zaine/Downloads/SYSC 4001/SYSC4001_A2_P2/SYSC4001_A2_P2$ gcc Part2.2_process1.c -o part2.2_process1;
zaineb@Zaineb:/mnt/c/Users/zaine/Downloads/SYSC 4001/SYSC4001_A2_P2/SYSC4001_A2_P2$ gcc Part2.2_process2.c -o part2.2_process2;
zaineb@Zaineb:/mnt/c/Users/zaine/Downloads/SYSC 4001/SYSC4001_A2_P2/SYSC4001_A2_P2$ ./part2.2_process1;
Process 1 Cycle number: 1
Process 2 Cycle number: -1
Process 1 Cycle number: 2
Process 2 Cycle number: -2
Process 1 Cycle number: 3 - 3 is a multiple of 3
Process 2 Cycle number: -3 - -3 is a multiple of 3
Process 1 Cycle number: 4
Process 2 Cycle number: -4
Process 1 Cycle number: 5
Process 2 Cycle number: -5
Process 1 Cycle number: 6 - 6 is a multiple of 3
Process 2 Cycle number: -6 - -6 is a multiple of 3
Process 1 Cycle number: 7
Process 2 Cycle number: -7
Process 1 Cycle number: 8
Process 2 Cycle number: -8
Process 1 Cycle number: 9 - 9 is a multiple of 3
Process 2 Cycle number: -9 - -9 is a multiple of 3
Process 1 Cycle number: 10
Process 2 Cycle number: -10
Process 1 Cycle number: 11
Process 2 Cycle number: -11
Process 1 Cycle number: 12 - 12 is a multiple of 3
Process 2 Cycle number: -12 - -12 is a multiple of 3
Process 1 Cycle number: 13
Process 2 Cycle number: -13
Process 1 Cycle number: 14
Process 2 Cycle number: -14
Process 1 Cycle number: 15 - 15 is a multiple of 3
Process 2 Cycle number: -15 - -15 is a multiple of 3
Process 1 Cycle number: 16
Process 2 Cycle number: -16
Process 1 Cycle number: 17
Process 2 Cycle number: -17
Process 1 Cycle number: 18 - 18 is a multiple of 3
Process 2 Cycle number: -18 - -18 is a multiple of 3
Process 1 Cycle number: 19
Process 2 Cycle number: -19
```

Reaches values lower than -500, exciting process 1 and 2

```
Process 2 Cycle number: -488
Process 1 Cycle number: 488
Process 2 Cycle number: -489 - (-489) is a multiple of 3
Process 1 Cycle number: 489 - 489 is a multiple of 3
Process 1 Cycle number: 490
Process 2 Cycle number: -490
Process 2 Cycle number: -491
Process 1 Cycle number: 491
Process 2 Cycle number: -492 - (-492) is a multiple of 3
Process 1 Cycle number: 492 - 492 is a multiple of 3
Process 2 Cycle number: -493
Process 1 Cycle number: 493
Process 1 Cycle number: 494
Process 2 Cycle number: -494
Process 2 Cycle number: -495 - (-495) is a multiple of 3
Process 1 Cycle number: 495 - 495 is a multiple of 3
Process 2 Cycle number: -496
Process 1 Cycle number: 496
Process 1 Cycle number: 497
Process 2 Cycle number: -497
Process 1 Cycle number: 498 - 498 is a multiple of 3
Process 2 Cycle number: -498 - (-498) is a multiple of 3
Process 1 Cycle number: 499
Process 2 Cycle number: -499
Process 2 Cycle number: -500
Process 1 Cycle number: 500
Process 2 Exiting: Reached a value lower than -500
Process 1 Cycle number: 501 - 501 is a multiple of 3
Process 1 Exiting: Process 2 has finished.
```

Question 4:

Initial, process 2 waiting:

```
zaineb@Zaineb:/mnt/c/Users/zaine/Downloads/SYSC 4001/SYSC4001_A2_P2/SYSC4001_A2_P2$ gcc Part2.4_process1.c -o part2.4_process1;
zaineb@Zaineb:/mnt/c/Users/zaine/Downloads/SYSC 4001/SYSC4001_A2_P2/SYSC4001_A2_P2$ gcc Part2.4_process2.c -o part2.4_process2;
zaineb@Zaineb:/mnt/c/Users/zaine/Downloads/SYSC 4001/SYSC4001_A2_P2/SYSC4001_A2_P2$ ./part2.4_process1;
Process 1: Counter = 0 - 0 is a multiple of 3
Process 2: Counter = 0, waiting for value of counter to exceed 100
Process 1: Counter = 1
Process 2: Counter = 1, waiting for value of counter to exceed 100
Process 1: Counter = 2
Process 2: Counter = 2, waiting for value of counter to exceed 100
Process 1: Counter = 3 - 3 is a multiple of 3
Process 2: Counter = 3, waiting for value of counter to exceed 100
Process 1: Counter = 4
Process 2: Counter = 4, waiting for value of counter to exceed 100
Process 1: Counter = 5
Process 2: Counter = 5, waiting for value of counter to exceed 100
Process 1: Counter = 6 - 6 is a multiple of 3
Process 2: Counter = 6, waiting for value of counter to exceed 100
Process 1: Counter = 7
Process 2: Counter = 7, waiting for value of counter to exceed 100
Process 1: Counter = 8
Process 2: Counter = 8, waiting for value of counter to exceed 100
Process 1: Counter = 9 - 9 is a multiple of 3
Process 2: Counter = 9, waiting for value of counter to exceed 100
Process 1: Counter = 10
Process 2: Counter = 10, waiting for value of counter to exceed 100
Process 1: Counter = 11
Process 2: Counter = 11, waiting for value of counter to exceed 100
Process 1: Counter = 12 - 12 is a multiple of 3
Process 2: Counter = 12, waiting for value of counter to exceed 100
Process 1: Counter = 13
Process 2: Counter = 13, waiting for value of counter to exceed 100
Process 1: Counter = 14
Process 2: Counter = 14, waiting for value of counter to exceed 100
Process 1: Counter = 15 - 15 is a multiple of 3
Process 2: Counter = 15, waiting for value of counter to exceed 100
Process 1: Counter = 16
Process 2: Counter = 16, waiting for value of counter to exceed 100
Process 1: Counter = 17
Process 2: Counter = 17, waiting for value of counter to exceed 100
Process 1: Counter = 18 - 18 is a multiple of 3
Process 2: Counter = 18, waiting for value of counter to exceed 100
Process 1: Counter = 19
Process 2: Counter = 19, waiting for value of counter to exceed 100
```

Process 2 starts when counter number exceeds 100:

```
Process 1: Counter = 99 - 99 is a multiple of 3
Process 2: Counter = 99, waiting for value of counter to exceed 100
Process 1: Counter = 100
Process 2: Counter = 100, waiting for value of counter to exceed 100
Process 1: Counter = 101
Process 2: Counter = 101
Process 1: Counter = 102 - 102 is a multiple of 3
Process 2: Counter = 102 - 102 is a multiple of 3
Process 1: Counter = 103
Process 2: Counter = 103
Process 1: Counter = 104
Process 2: Counter = 104
Process 1: Counter = 105 - 105 is a multiple of 3
Process 2: Counter = 105 - 105 is a multiple of 3
Process 1: Counter = 106
Process 2: Counter = 106
Process 1: Counter = 107
Process 2: Counter = 107
Process 1: Counter = 108 - 108 is a multiple of 3
Process 2: Counter = 108 - 108 is a multiple of 3
Process 1: Counter = 109
Process 2: Counter = 109
Process 1: Counter = 110
Process 2: Counter = 110
Process 1: Counter = 111 - 111 is a multiple of 3
Process 2: Counter = 111 - 111 is a multiple of 3
Process 1: Counter = 112
Process 2: Counter = 112
Process 1: Counter = 113
Process 2: Counter = 113
Process 1: Counter = 114 - 114 is a multiple of 3
Process 2: Counter = 114 - 114 is a multiple of 3
Process 1: Counter = 115
Process 2: Counter = 115
Process 1: Counter = 116
Process 2: Counter = 116
Process 1: Counter = 117 - 117 is a multiple of 3
Process 2: Counter = 117 - 117 is a multiple of 3
Process 1: Counter = 118
```

Shared variable is larger than 500, Process 1 and 2 exit:

```
Process 1: Counter = 489 - 489 is a multiple of 3
Process 2: Counter = 489 - 489 is a multiple of 3
Process 1: Counter = 490
Process 2: Counter = 490
Process 1: Counter = 491
Process 2: Counter = 491
Process 1: Counter = 492 - 492 is a multiple of 3
Process 2: Counter = 492 - 492 is a multiple of 3
Process 1: Counter = 493
Process 2: Counter = 493
Process 1: Counter = 494
Process 2: Counter = 494
Process 1: Counter = 495 - 495 is a multiple of 3
Process 2: Counter = 495 - 495 is a multiple of 3
Process 1: Counter = 496
Process 2: Counter = 496
Process 1: Counter = 497
Process 2: Counter = 497
Process 1: Counter = 498 - 498 is a multiple of 3
Process 2: Counter = 498 - 498 is a multiple of 3
Process 1: Counter = 499
Process 2: Counter = 500
Process 1: Counter = 500
Process 2 Exiting: value of counter is over 500
Process 1 Exiting: value of counter is over 500.
```

Question 5:

Initial, process 2 waiting:

```
zaineb@Zaineb:/mnt/c/Users/zaine/Downloads/SYSC 4001/SYSC4001_A2_P2/SYSC4001_A2_P2$ gcc Part2.5_process1.c -o part2.5_process1;
zaineb@Zaineb:/mnt/c/Users/zaine/Downloads/SYSC 4001/SYSC4001_A2_P2/SYSC4001_A2_P2$ gcc Part2.5_process2.c -o part2.5_process2;
zaineb@Zaineb:/mnt/c/Users/zaine/Downloads/SYSC 4001/SYSC4001_A2_P2/SYSC4001_A2_P2$ ./part2.5_process1;
Process 1: Counter = 0 - 0 is a multiple of 3
Process 2: Counter = 1, waiting for value of counter to exceed 100
Process 1: Counter = 1
Process 2: Counter = 2, waiting for value of counter to exceed 100
Process 1: Counter = 2
Process 2: Counter = 3, waiting for value of counter to exceed 100
Process 1: Counter = 3 - 3 is a multiple of 3
Process 2: Counter = 4, waiting for value of counter to exceed 100
Process 1: Counter = 4
Process 2: Counter = 5, waiting for value of counter to exceed 100
Process 1: Counter = 5
Process 2: Counter = 6, waiting for value of counter to exceed 100
Process 1: Counter = 6 - 6 is a multiple of 3
Process 2: Counter = 7, waiting for value of counter to exceed 100
Process 1: Counter = 7
Process 2: Counter = 8, waiting for value of counter to exceed 100
Process 1: Counter = 8
Process 2: Counter = 9, waiting for value of counter to exceed 100
Process 1: Counter = 9 - 9 is a multiple of 3
Process 2: Counter = 10, waiting for value of counter to exceed 100
Process 1: Counter = 10
Process 2: Counter = 11, waiting for value of counter to exceed 100
Process 1: Counter = 11
Process 2: Counter = 12, waiting for value of counter to exceed 100
Process 1: Counter = 12 - 12 is a multiple of 3
Process 2: Counter = 13, waiting for value of counter to exceed 100
Process 1: Counter = 13
Process 2: Counter = 14, waiting for value of counter to exceed 100
Process 1: Counter = 14
Process 2: Counter = 15, waiting for value of counter to exceed 100
Process 1: Counter = 15 - 15 is a multiple of 3
Process 2: Counter = 16, waiting for value of counter to exceed 100
Process 1: Counter = 16
Process 2: Counter = 17, waiting for value of counter to exceed 100
Process 1: Counter = 17
Process 2: Counter = 18, waiting for value of counter to exceed 100
Process 1: Counter = 18 - 18 is a multiple of 3
Process 2: Counter = 19, waiting for value of counter to exceed 100
Process 1: Counter = 19
Process 2: Counter = 20, waiting for value of counter to exceed 100
```

Process 2 starts when counter number exceeds 100:

```
Process 1: Counter = 97
Process 2: Counter = 98, waiting for value of counter to exceed 100
Process 1: Counter = 98
Process 2: Counter = 99, waiting for value of counter to exceed 100
Process 1: Counter = 99 - 99 is a multiple of 3
Process 2: Counter = 100, waiting for value of counter to exceed 100
Process 1: Counter = 100
Process 2: Counter = 101
Process 1: Counter = 101
Process 2: Counter = 102 - 102 is a multiple of 3
Process 1: Counter = 102 - 102 is a multiple of 3
Process 2: Counter = 103
Process 1: Counter = 103
Process 2: Counter = 104
Process 1: Counter = 104
Process 2: Counter = 105 - 105 is a multiple of 3
Process 1: Counter = 105 - 105 is a multiple of 3
Process 2: Counter = 106
Process 1: Counter = 106
Process 2: Counter = 107
Process 1: Counter = 107
Process 2: Counter = 108 - 108 is a multiple of 3
Process 1: Counter = 108 - 108 is a multiple of 3
Process 2: Counter = 109
Process 1: Counter = 109
Process 2: Counter = 110
Process 1: Counter = 110
Process 2: Counter = 111 - 111 is a multiple of 3
Process 1: Counter = 111 - 111 is a multiple of 3
Process 2: Counter = 112
Process 1: Counter = 112
Process 2: Counter = 113
Process 1: Counter = 113
Process 2: Counter = 114 - 114 is a multiple of 3
Process 1: Counter = 114 - 114 is a multiple of 3
Process 2: Counter = 115
Process 1: Counter = 115
Process 2: Counter = 116
Process 1: Counter = 116
Process 2: Counter = 117 - 117 is a multiple of 3
Process 1: Counter = 117 - 117 is a multiple of 3
Process 2: Counter = 118
Process 1: Counter = 118
```

Shared variable is larger than 500, Process 1 and 2 exit:

```
Process 2: Counter = 481
Process 1: Counter = 481
Process 2: Counter = 482
Process 1: Counter = 482
Process 2: Counter = 483 - 483 is a multiple of 3
Process 1: Counter = 483 - 483 is a multiple of 3
Process 2: Counter = 484
Process 1: Counter = 484
Process 2: Counter = 485
Process 1: Counter = 485
Process 2: Counter = 486 - 486 is a multiple of 3
Process 1: Counter = 486 - 486 is a multiple of 3
Process 2: Counter = 487
Process 1: Counter = 487
Process 2: Counter = 488
Process 1: Counter = 488
Process 2: Counter = 489 - 489 is a multiple of 3
Process 1: Counter = 489 - 489 is a multiple of 3
Process 2: Counter = 490
Process 1: Counter = 490
Process 2: Counter = 491
Process 1: Counter = 491
Process 2: Counter = 492 - 492 is a multiple of 3
Process 1: Counter = 492 - 492 is a multiple of 3
Process 2: Counter = 493
Process 1: Counter = 493
Process 2: Counter = 494
Process 1: Counter = 494
Process 2: Counter = 495 - 495 is a multiple of 3
Process 1: Counter = 495 - 495 is a multiple of 3
Process 2: Counter = 496
Process 1: Counter = 496
Process 2: Counter = 497
Process 1: Counter = 497
Process 2: Counter = 498 - 498 is a multiple of 3
Process 1: Counter = 498 - 498 is a multiple of 3
Process 2: Counter = 499
Process 1: Counter = 499
Process 2: Counter = 500
Process 1 Exiting: value of counter is over 500.
Process 2 Exiting: value of counter is over 500
```