Stage 1
We get an error message whenever we try to test something.
Sender:

```
> 1 + 2
1 + 2
###[ Ethernet ]###
  dst       = 00:04:00:00:00:00
  src       = 00:04:00:00:00:00
  type      = 0x1234
###[ P4calc ]###
     P         = 'P'
     Four      = '4'
     version   = 0x1
     op        = '+'
     operand_a = 1
     operand_b = 2
     result    = 3735927486
###[ Raw ]###
        load      = ' '
```

Receiver:

```
pi@p4pi:~/daoxin/CWM-ProgNets/assignment4$ sudo python3 calc_receiver.py
list index out of range
```

Stage 2:

Updated calc.p4, calc_reciever.py and calc_sender.py.
See: https://github.com/tauzn-clock/CWM-ProgNets/tree/main/assignment4
After compiling and loading the p4 file on the switch,

```
pi@p4pi:~/daoxin/CWM-ProgNets/assignment4$ p4c --target bmv2 --arch v1model --std p4-16 calc.p4
pi@p4pi:~/daoxin/CWM-ProgNets/assignment4$ sudo simple_switch -i 0@eth0 calc.json
Calling target program-options parser
Adding interface eth0 as port 0
```

When we send a command via calc_sender.py,

```
> 123 + 456
123 + 456
###[ Ethernet ]###
  dst       = 00:04:00:00:00:00
  src       = 00:04:00:00:00:00
  type      = 0x1234
###[ P4calc ]###
     P         = 'P'
     Four      = '4'
     version   = 0x1
     op        = '+'
     operand_a = 123
     operand_b = 456
     result    = 3735927486
###[ Raw ]###
        load      = ' '
```

We see this via calc_receiver.py

```
579
###[ Ethernet ]###
  dst       = 00:04:00:00:00:00
  src       = 00:04:00:00:00:00
  type      = 0x1234
###[ P4calc ]###
     P         = 'P'
     Four      = '4'
     version   = 0x1
     op        = '+'
     operand_a = 123
     operand_b = 456
     result    = 579
###[ Raw ]###
        load      = ' '
```

Testing for minus

```
333
###[ Ethernet ]###
  dst       = 00:04:00:00:00:00
  src       = 00:04:00:00:00:00
  type      = 0x1234
###[ P4calc ]###
     P         = 'P'
     Four      = '4'
     version   = 0x1
     op        = '-'
     operand_a = 456
     operand_b = 123
     result    = 333
###[ Raw ]###
        load      = ' '
```

Taking AND

```
9
###[ Ethernet ]###
  dst       = 00:04:00:00:00:00
  src       = 00:04:00:00:00:00
  type      = 0x1234
###[ P4calc ]###
     P         = 'P'
     Four      = '4'
     version   = 0x1
     op        = '&'
     operand_a = 15
     operand_b = 9
     result    = 9
###[ Raw ]###
        load      = ' '
```

Taking OR

```
15
###[ Ethernet ]###
  dst       = 00:04:00:00:00:00
  src       = 00:04:00:00:00:00
  type      = 0x1234
###[ P4calc ]###
     P         = 'P'
     Four      = '4'
     version   = 0x1
     op        = '|'
     operand_a = 15
     operand_b = 9
     result    = 15
###[ Raw ]###
        load      = ' '
```

Taking XOR

```
6
###[ Ethernet ]###
  dst       = 00:04:00:00:00:00
  src       = 00:04:00:00:00:00
  type      = 0x1234
###[ P4calc ]###
     P         = 'P'
     Four      = '4'
     version   = 0x1
     op        = '^'
     operand_a = 15
     operand_b = 9
     result    = 6
###[ Raw ]###
        load      = ' '
```