

# Capstone Task Day 02

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## Tasks:

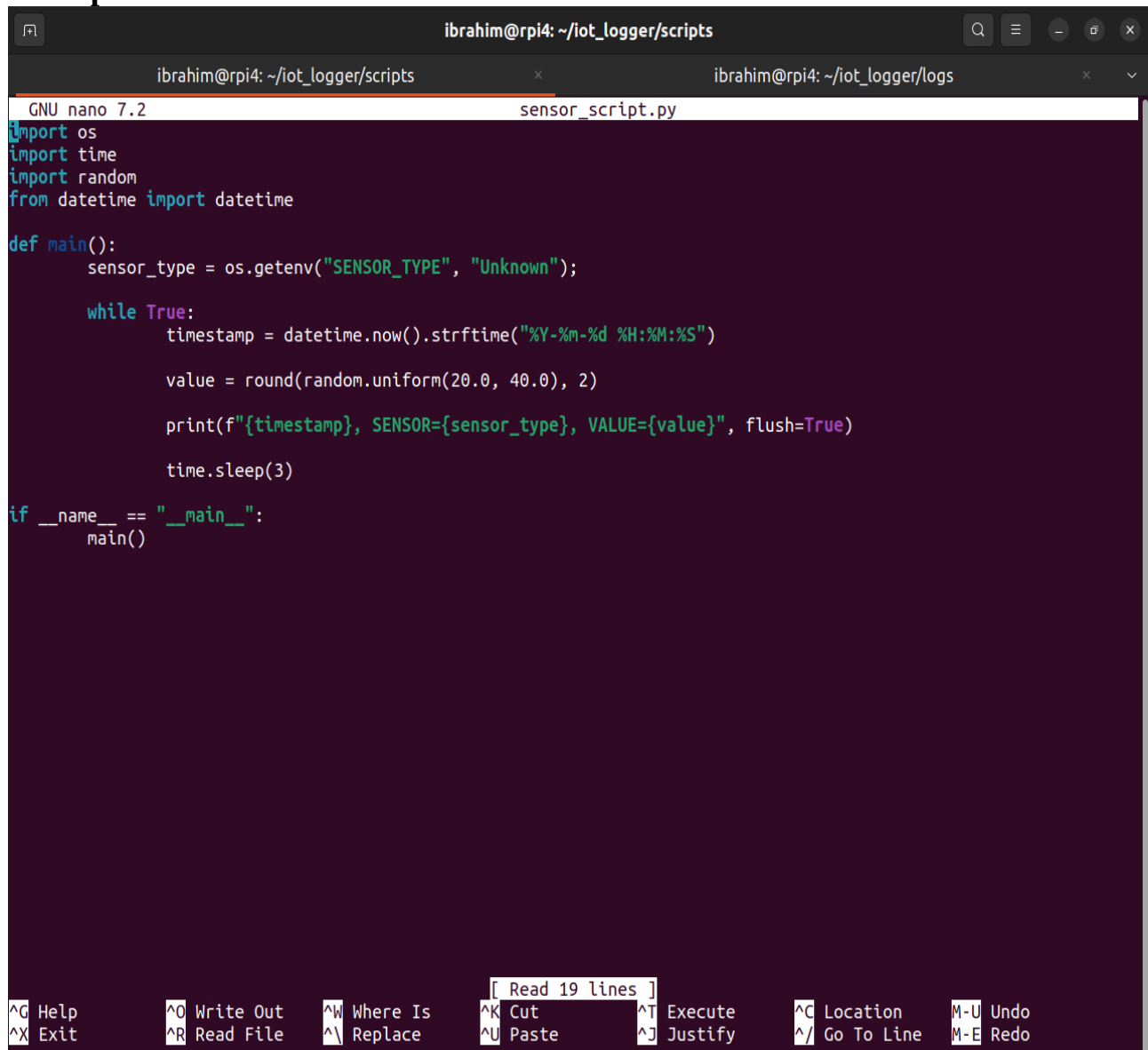
### 1. running

```
ibrahim@rpi4: ~/iot_logger
ibrahim@rpi4: ~/iot_logger
ibrahim@rpi4: ~/iot_logger $ export SENSOR_TYPE=temprature
ibrahim@rpi4: ~/iot_logger $ env | grep "SENSOR_TYPE"
SENSOR_TYPE=temprature
ibrahim@rpi4: ~/iot_logger $ cd scripts/
ibrahim@rpi4: ~/iot_logger/scripts $ ls
sensor_script.py
ibrahim@rpi4: ~/iot_logger/scripts $ nano sensor_script.py
ibrahim@rpi4: ~/iot_logger/scripts $ cd ..
ibrahim@rpi4: ~/iot_logger $ python3 scripts/sensor_script.py > logs/temperature.log &
[1] 2106
ibrahim@rpi4: ~/iot_logger $ echo $1
2106
ibrahim@rpi4: ~/iot_logger $ echo $!
2106
ibrahim@rpi4: ~/iot_logger $ ls -l /proc/2106/fd
total 0
lrwx----- 1 ibrahim ibrahim 64 Sep  4 17:31 0 -> /dev/pts/0
l-wx----- 1 ibrahim ibrahim 64 Sep  4 17:31 1 -> /home/ibrahim/iot_logger/logs/temperature.log
lrwx----- 1 ibrahim ibrahim 64 Sep  4 17:31 2 -> /dev/pts/0
ibrahim@rpi4: ~/iot_logger $ kill %1
ibrahim@rpi4: ~/iot_logger $ awk -F= '{ if ($3 > 37) print }' logs/temperature.log > high_temp.log
[1]+  Terminated                  python3 scripts/sensor_script.py > logs/temperature.log
ibrahim@rpi4: ~/iot_logger $ cat high_temp.log
2025-09-04 17:29:51, SENSOR=temprature, VALUE=37.05
2025-09-04 17:30:09, SENSOR=temprature, VALUE=39.2
2025-09-04 17:30:12, SENSOR=temprature, VALUE=39.58
2025-09-04 17:30:54, SENSOR=temprature, VALUE=38.39
ibrahim@rpi4: ~/iot_logger $ cp logs/*. data/
cp: cannot stat 'logs/*.': No such file or directory
ibrahim@rpi4: ~/iot_logger $ cp logs/*.log data/
cp: cannot stat 'logs/temperature_soft.log': No such file or directory
ibrahim@rpi4: ~/iot_logger $ ls
data high_temp.log logs scripts
ibrahim@rpi4: ~/iot_logger $ mv high_temp.log ./logs/
ibrahim@rpi4: ~/iot_logger $ cp ./logs/*.log ./data/
cp: cannot stat './logs/temperature_soft.log': No such file or directory
ibrahim@rpi4: ~/iot_logger $ rm ./logs/temperature_soft.log
ibrahim@rpi4: ~/iot_logger $ cp ./logs/*.log ./data/
ibrahim@rpi4: ~/iot_logger $ ls data/
high_temp.log services temperature.log temperature_hard.log
ibrahim@rpi4: ~/iot_logger $ unset SENSOR_TYPE
ibrahim@rpi4: ~/iot_logger $
```

## 2.History

```
ibrahim@rpi4: ~/iot_logger
ibrahim@rpi4: ~/iot_logger x ibrahim@rpi4: ~/iot_logger/logs x v
720 fg 2737
721 fg %1
722 echo "background to foreground" sleep 100 &
723 fg %1
724 echo "background to foreground" sleep 100 &&
725 echo "background to foreground" sleep 100 &
726 fg %1
727 sleep 100
728 sleep 100 &
729 kill -9 2749
730 jobs
731 ps -ef | grep daemon
732 clear
733 sudo shutdown now
734 clear
735 ls
736 cd iot_logger/
737 clear
738 export SENSOR_TYPE=temprature
739 env | grep "SENSOR_TYPE"
740 cd scripts/
741 ls
742 nano sensor_script.py
743 cd ..
744 python3 scripts/sensor_script.py > logs/temperature.log &
745 echo $1
746 echo $!
747 ls -l /proc/2106/fd
748 kill %1
749 awk -F= '{ if ($3 > 37) print }' logs/temperature.log > high_temp.log
750 cat high_temp.log
751 cp logs/*. data/
752 cp logs/*.log data/
753 ls
754 mv high_temp.log ./logs/
755 cp ./logs/*.log ./data/
756 rm ./logs/temperature_soft.log
757 cp ./logs/*.log ./data/
758 ls data/
759 unset SENSOR_TYPE
760 history
ibrahim@rpi4:~/iot_logger $
```

### 3.Script



```
ibrahim@rpi4: ~/iot_logger/scripts
GNU nano 7.2 sensor_script.py
import os
import time
import random
from datetime import datetime

def main():
    sensor_type = os.getenv("SENSOR_TYPE", "Unknown");

    while True:
        timestamp = datetime.now().strftime("%Y-%m-%d %H:%M:%S")

        value = round(random.uniform(20.0, 40.0), 2)

        print(f"{timestamp}, SENSOR={sensor_type}, VALUE={value}", flush=True)

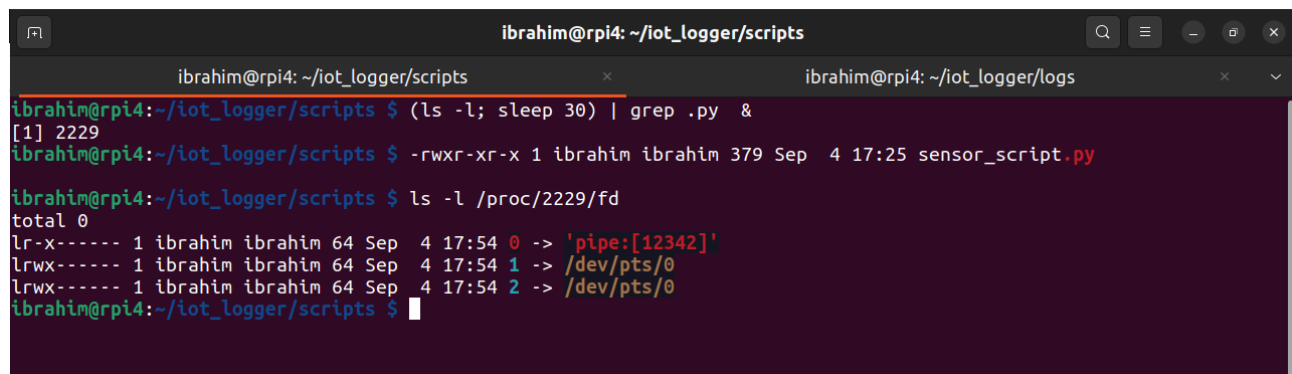
        time.sleep(3)

if __name__ == "__main__":
    main()
```

Read 19 lines ]

^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location M-U Undo  
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^\_ Go To Line M-E Redo

### 4.Challenge – Pipes & FD inspection :



```
ibrahim@rpi4: ~/iot_logger/scripts
ibrahim@rpi4: ~/iot_logger/scripts
ibrahim@rpi4:~/iot_logger/scripts $ (ls -l; sleep 30) | grep .py &
[1] 2229
ibrahim@rpi4:~/iot_logger/scripts $ -rwxr-xr-x 1 ibrahim ibrahim 379 Sep  4 17:25 sensor_script.py
ibrahim@rpi4:~/iot_logger/scripts $ ls -l /proc/2229/fd
total 0
lr-x----- 1 ibrahim ibrahim 64 Sep  4 17:54 0 -> 'pipe:[12342]'
lrwx----- 1 ibrahim ibrahim 64 Sep  4 17:54 1 -> /dev/pts/0
lrwx----- 1 ibrahim ibrahim 64 Sep  4 17:54 2 -> /dev/pts/0
ibrahim@rpi4:~/iot_logger/scripts $
```

## Open-Ended Questions:

### 1.in shell single quotation differ then double quotation

- 1.1. “: any thing between “ as string no variable replacement
- 1.2 “”: special case of deal with line if contains vars

### 2. [ -f filename ] vs [ -d dirname ]

- 2.1.[ -f filename ]: check file is exist or not
- 2.2.[ -d dirname ]: check directory is exist or not

### 3. any process in linux has a file descriptor (df) refer to output, input, error

- stdout 1 for output
- stderr 2 for error
- stdin 0 for input

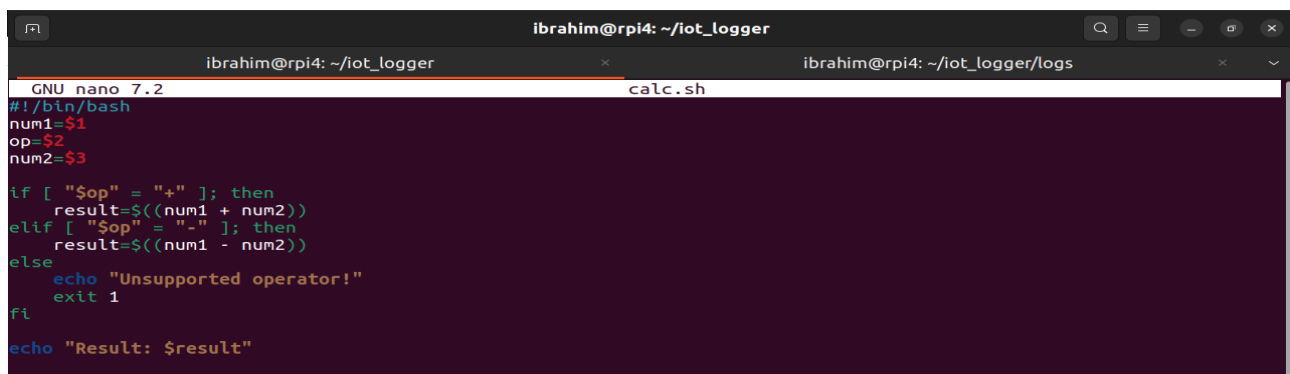
IO redirection: let us to take example about terminal if you write prompt such that : echo “hello sic” the default output in terminal stdout 1 for printing in terminal, we can change from terminal to any file we need such that:

echo “hello sic” > sic.txt

another example if you write any prompt in terminal need input the default input dierction will take from terminal, but what if we need the program to take its input from another file such that :

echo < sic.txt

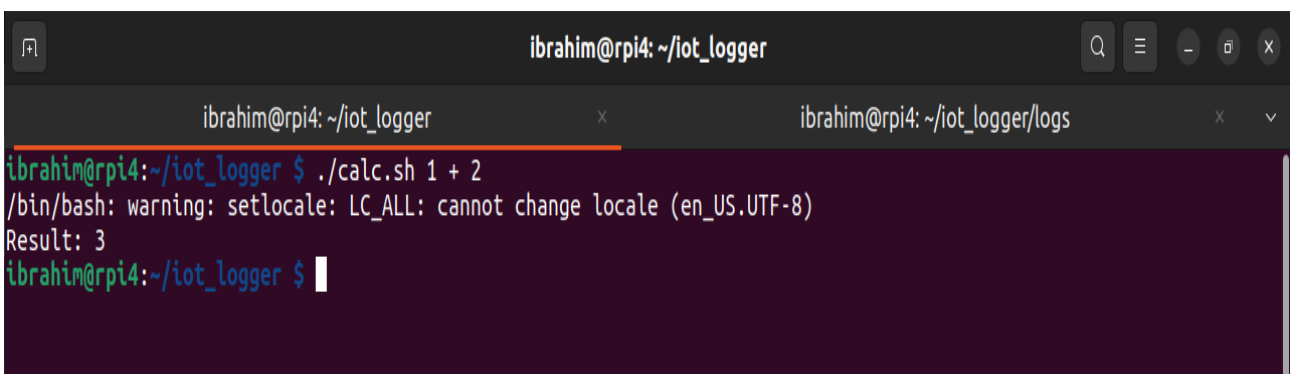
### 4.calculator:



```
ibrahim@rpi4: ~/iot_logger
GNU nano 7.2 calc.sh
#!/bin/bash
num1=$1
op=$2
num2=$3

if [ "$op" = "+" ]; then
    result=$((num1 + num2))
elif [ "$op" = "-" ]; then
    result=$((num1 - num2))
else
    echo "Unsupported operator!"
    exit 1
fi

echo "Result: $result"
```



```
ibrahim@rpi4: ~/iot_logger
ibrahim@rpi4:~/iot_logger $ ./calc.sh 1 + 2
/bin/bash: warning: setlocale: LC_ALL: cannot change locale (en_US.UTF-8)
Result: 3
ibrahim@rpi4:~/iot_logger $
```