Prelab 2.2 Python algorithms for datetime and saving into a csv file

2.1 Python datetime function

Python has a special date class, called "date." A date, like a string, or a number, or a numpy array, has special rules for creating it and methods for working with it.

Here is an example on computing and printing local date and time:

In [ ]:
```
# Import datetime from the datetime module
from datetime import datetime

# Compute the local datetime: local_dt
local_dt = datetime.now()

# Print the local datetime
print(local_dt)
```

```
2023-01-25 12:48:55.184895
```

2.2 Formating date and time

You can also display the datetime function in different ways depending on convenience. The following example illustrates how to personalize the date-time formatting:

In [ ]:
```
# Compute the local datetime: local_dt
local_dt = datetime.now().strftime("%Y-%m-%d %H:%M:%S.%f") #The string inside paren

# Print the local datetime
print(local_dt)
```

```
2023-01-25 12:48:56.775181
```

Task 2.1

Display the local datetime in the following formats:

- month/day/year
- hour:minute:second

In [ ]:
```
#Write your code below this line:
# Compute the local datetime: local_dt
local_dt = datetime.now().strftime("%m-%d-%y %H:%M:%S.%f") #The string inside paren
```

```
# Print the local datetime
print(local_dt)
```

```
01-25-23 12:48:58.827652
```

You can also perform arithmetics in Python.

In [ ]:
```
# Import date
from datetime import date
# Create Dates
superbowl_dates = [date(2019, 2, 3), date(2020, 2, 2), date(2021, 2, 7), date(2022,

#Subtracting the third and first date
difference = superbowl_dates[2]-superbowl_dates[0]

#Print the results as a sentence. You can concat strings by using commas
print('The difference between the Superbowl on',superbowl_dates[2],'and',superbowl_
```

```
The difference between the Superbowl on 2021-02-07 and 2021-02-07 is 735 days, 0:0
0:00
```

You can also use a time function as well. The following example calculates the time difference after printing a string:

In [ ]:
```
#Import time library
import time
start = time.time()
print("hello") #Printing the string = hello
end = time.time()
print(end - start,'seconds')
```

```
hello
0.0 seconds
```

Task 2.2

- Calculate how many days are left on this year.
- Determine if the processing time for printing longer strings in Python changes significantly in terms of seconds.

In [ ]:
```
#Write your code below here.
import time
from datetime import datetime
from datetime import date
print("days left in this year", (date(2023,12,31) - datetime.now().date()).days, "d
start = time.time()
print("123123123")
end = time.time()
print("processing time for printing 9 char is : ", end - start ,"seconds")
start = time.time()
print("123123123123123123123123123123123123123123123123123123123123123123123123123123123
end = time.time()
print("processing time for printing 576 char is : ", end - start ,"seconds")
print("conclusion: it is not versy significant")
```

```
days left in this year 340 days
123123123
processing time for printing 9 char is :  0.0 seconds
123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123123
processing time for printing 576 char is :  0.0 seconds
conclusion: it is not versy significant
```

2.3 Using Python to save data in a csv file

The following algorithm performs data saving of multiples rows in a csv file.

Warning: These algorithm will not run on its own. It requires additional lines of code that connect the data with to the algorithm.

Python - use this code block to save data in a csv file on the Raspberry Pi

```
# writing to CSV file using csv package
with open(filename, 'w') as f:
    # creating a CSV wiriting object
    write = csv.writer(f)

    # writing header on the first row
    write.writerow(header)

    #Use a 'while' or 'for' cycle to extract data row by row.
    while (declare the conditional within these parentheses):
        i += 1              # indicator + 1 for each row in a loop
                            # write your timestamp for measurement
                            #extract information from the sensor
and save it as a variable


        data = [timestamp, str(var1), str(var2), str(var3)] # data
list, all elements are string data type

        write.writerow(data) # writing measured data

        # printing indicator, timestamp, var1, var2, var3 (this
section is optional)
        print("{}th measurement, {}:\n var1={:.4f}units, var2=
{:.4f}units, var3={:.4f}unit\n".format(i, timestamp, var1, var2,
var3))
```

```
            time.sleep(1)

    # gently close the CSV file object
    f.close()
```

Task 2.3

Model the code block above to illustrate how to save data in a CSV file by creating a flow diagram that illustrates the logic, sequence, and processes of the activity.

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https://app.diagrams.net/#HGeorge0023%2Fpurdue_me597%2Fmain%2Flab%2Flab1%2Fimgs%2
