Computational Thinking Using Python – CSE1500

Lab sheet - 1.2

Problem: Convert a number of minutes into hours and remaining minutes.

Python Code:

```
total_minutes = int(input("enter minutes"))
# Calculations using arithmetic operators
hours = total_minutes // 60  # Integer division to get the number of full hours
remaining_minutes = total_minutes % 60  # Modulo operator to get the remainder
# Print the result
print("total minutes ", total_minutes)
print("is equal to ", hours, "hours and", remaining_minutes, " minutes.")
```

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Program 2: A teacher has 50 chocolates and wants to distribute them equally among 6 students. Find how many chocolates each student gets and how many remain.

Python Code:

```
# Number of chocolates
chocolates = 50
# Number of students
students = 6
# Using floor division and modulus
chocolates_per_student = chocolates // students
remaining_chocolates = chocolates % students
# Display results
print("Each student gets:", chocolates_per_student, "chocolates")
print("Remaining chocolates:", remaining_chocolates)
```

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Activity for student:

In an organization the gross salary for an employee is computed as per the below formula

Gross salary = Basic salary + HRA + DA

After computing the gross salary, the net salary is computed using the below formula

Net salary = Gross salary – Professional tax – income tax

Requirements:

a. The Basic salary, HRA and DA has to be captured
b. The gross salary has to be computed using the above formula
c. Professional tax has to be captured (Rs.200)
d. Income tax is the 10% of the gross salary
e. Net salary has to be computed using the above formula
f. Display the net salary drawn by the employee

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Problem: The Delhi government has issued a circular to control vehicular pollution. The circular restricts the use of vehicles based on their registration numbers:

- Odd-numbered vehicles are not permitted on Monday, Wednesday, and Friday.
- Even-numbered vehicles are not permitted on Tuesday, Thursday, and Saturday.

A software application is to be developed for the Delhi Government to inform vehicle owners on which days they are permitted to use their vehicles.

The application's requirements are: a. Capture the vehicle's registration number from the owner. b. Determine if the registration number is odd or even. c. Inform the user on which days they are allowed to use the vehicle.

Python Code:

```
#  read  the registration number from the user.
vno = int(input("Enter the last four digits of your vehicle number  "))
# Check if the registration number is odd or even.
# The modulo operator (%) determines if a number is even or odd.
if vno % 2 == 0:
   # Inform the user on which day they can use the vehicle.
   print("Your vehicle has an even registration number.")
```

```
    print("You are allowed to use your vehicle on:")
    print("Monday, Wednesday, Friday, and Sunday.")
else:
    print("Your vehicle has an odd registration number.")
    print("You are allowed to use your vehicle on:")
    print("Tuesday, Thursday, Saturday, and Sunday.")
print("end of the program")
```

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Problem: A website needs to verify if a user's provided password is correct and if they are old enough (age must be greater than or equal to 18) to create an account.

Python Code:

```
stored_password = "Presi@123"
user_input_password = input("enter the pass word")
user_age = int(input("enter your age"))
# Conditions using relational operators
if user_age<18:
    print("You must be 18 or older to create an account.")
elif user_input_password == stored_password :
    print("Login successful. Access granted.")
else:
    print("incorrect password")
```

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Activity for student:

Class Coordinator of the 2PHY03 wants to select the student class representative. A student is eligible to become class representative if he/she has scored minimum of 75% in 12th Standard (PUC) or less than 10K ranking in the entrance test.

A software need to be developed to help Class coordinator to select the class representative.

a. Students rank in entrance test should be captured.
b. Students 12th percentage should be captured.
c. Check if rank is less than 10k or 12th percentage is more than 75%
d. If any one of the criteria is true, Display Eligible.
e. If none of the criteria is true, Display Not Eligible.

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Problem: Imagine you're developing a simple application for a digital calendar. Your task is to make the user interface intuitive, so instead of making users type out the full name of a weekday, you'll let them enter a number from 1 to 7.

The program should ask the user to "Enter a number (1-7) corresponding to a day of the week."

Once the user enters a number:

- If the number is 1, the program should display "Monday".
- If the number is 2, it should display "Tuesday".
- This pattern continues until 7, which should display "Sunday".

Python Code:

```
# Prompt the user to enter a number for the day of the week.
day_number_str = input("Enter a number (1-7) day of the week: ")

# Convert the input string to an integer.
day_number = int(day_number_str)

# Use conditional statements to determine the day's name.
if day_number == 1:
    print("Monday")
elif day_number == 2:
    print("Tuesday")
elif day_number == 3:
    print("Wednesday")
elif day_number == 4:
    print("Thursday")
elif day_number == 5:
    print("Friday")
elif day_number == 6:
    print("Saturday")
elif day_number == 7:
    print("Sunday")
else:
    print("Invalid input. Please enter a number between 1 and 7.")
print("end of the main")
```

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Activity for student:

Ranjith Kumar run a Parking counter in Airport. Minimum parking charges is Rs 100. The parking cost will increase as per the table given below,

Duration	Price
1-2 hours	Minimum price
Up to 4 hours	Additional 50 Rs / per hour
Up to 6 hours	Additional 60 Rs / per hour
More than 6 hours	Additional 200 Rs

As software need to be developed to compute the cost for parking with following requirements.

a. Capture duration of parking.

b. Check the time duration as per the table given above.
c. Compute the cost of parking.
d. Display the final cost.

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