

Handout for Session 2

A. Type of object

```
[1]: type(3)
```

```
int
```

Q1: What are the types of the following objects? a) 3.1 b) 3.0 c) '3' d) True e) print

B. Operators

```
[2]: 2+5*5
```

```
27
```

Q2: What do the following operators do when used with numbers? a) * b) / c) // d) ** e) == f) != g) >=

Q3: What do the following operators do when used with strings? a) + b) == c) != d) > e) >=

Q4: Predict the output of the following expressions: a) 3**2+5 b) 5+(6>3)*2 c) 4*(5+2-1)+(6==1) d) 6//4 e) '3'+ '2' f) '3'+2

C. Variables

```
[3]: a='Hello world'
```

```
    a=a+'!'
```

```
    a
```

```
'Hello world!'
```

Q5: Explain each of the following and predict what will be the final output after executing all three sequentially. a) x=3-1 b) x=x+1 c) x=2**x

D. Interacting with User

```
[4]: a=input('Please enter your name: ')
```

```
    print('Hello',a)
```

```
Please enter your name: Peng
```

```
Hello Peng
```

E. Type Conversion

```
[5]: a=str(3)
```

```
    a
```

```
'3'
```

```
[6]: q=int(input('Input quantity sold:'))
```

```
    p=float(input('Input the profit of each unit:'))
```

```
    print('Total profit is',p*q)
```

```
Input quantity sold:40
```

```
Input the profit of each unit:5
```

```
Total profit is 200.0
```

Case 1. Calculator for Present Value

Write a program that calculates the present value of a certain investment, which will pay off a cash value of C in n years. The program should ask the user to input the final cash value C , the annual interest rate r (in percentage points), and the number of years n . The formula for present value V is

$$V = \frac{C}{(1 + \frac{r}{100})^n}$$

Input the final cash value: 1000000
Input the annual interest rate in percent: 4.5
Input the number of years: 10
The present value is 643927.682030043

```
[1]: reward=float(input('Input the final cash value: '))
    interest=float(input('Input the annual interest rate in percent: '))
    years=float(input('Input the number of years: '))
    PV=reward/(1+interest/100)**years
    print('The present value is',PV)
```

Input the final cash value: 1000000
Input the annual interest rate in percent: 4.5
Input the number of years: 10
The present value is 643927.682030043

F. Conditional Execution

```
[8]: password='Marshall'
    a=input('Input the access code:')
    if a==password:
        print('Correct access code.')
    else:
        print('Incorrect access code.')
```

Input the access code:USC
Incorrect access code.

Case 2. Basestock Policy in Inventory Management

Write a program that asks the user for the current inventory level. If the inventory is at least equal to 100, then output Sufficient inventory. No need to order. Otherwise, output Order x units, where x is 100 minus the inventory.

Sample output:

Current inventory: 75
Order 25 units

```
[1]: basestock=100
    inventory=input('Current inventory: ')
    inventory=int(inventory)
```

```

if inventory>=basestock:
    print('Sufficient inventory. No need to order.')
else:
    print('Order',basestock-inventory,'units.')

```

Current inventory: 25
Order 75 units.

Case 3. Wage Calculator for Payroll

Write a program that asks the user for how many hours they worked this week, and output their total weekly pay. Pay is calculated as follows: for the first 40 hours, the hourly pay is 10. After that there is a 50 percent bonus per additional hour worked.

Sample output:

Hours worked this week:42.5
Total pay this week is 437.5

```

[2]: baseWage=10
    bonus=5
    hours=input('Hours worked this week:')
    hours=float(hours)
    if hours<=40:
        pay=hours*baseWage
    else:
        pay=hours*baseWage+(hours-40)*bonus
    print('Total pay this week is',pay)

```

Hours worked this week:42.5
Total pay this week is 437.5

Additional Exercises for Session 2

Case 4. Blood Pressure Checker

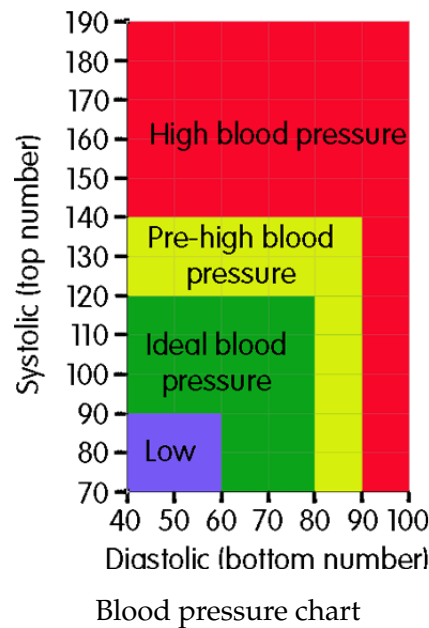
Write a program that asks for the user's systolic and diastolic blood pressure, and output one of LOW, IDEAL, PRE-HIGH or HIGH according to the following chart.

```

[3]: high=float(input('Systolic blood pressure:'))
    low=float(input('Diastolic blood pressure:'))
    if low<=60 and high<=90:
        answer='LOW'
    elif low<=80 and high<=120:
        answer='IDEAL'
    elif low<=90 and high<=140:
        answer='PRE-HIGH'
    else:
        answer='HIGH'

    print('Your blood pressure is',answer)

```



Systolic blood pressure:130
 Diastolic blood pressure:90
 Your blood pressure is PRE-HIGH

Case 5. Blood Sugar Checker

Write a program that asks the user how many hours they have fasted and their current blood sugar level. If they have fasted less than 2 hours, then output You need to fast at least 2 hours to perform this test. If they fasted at least 2 hours but less than 8 hours, then output Your blood sugar level is high if it is more than 140, and Your blood sugar level is normal otherwise. If they have fasted for at least 8 hours, then the threshold changes to 100 (instead of 140).

```
[5]: hours=float(input('How many hours have you fasted: '))
    level=float(input('What is your blood sugar level: '))
    high_msg='You blood sugar level is high.'
    low_msg='Your blood suguar level is normal.'
    if hours<2:
        print('You need to fast at least 2 hours to perform this test.')
    elif hours<8:
        if level>140:
            print(high_msg)
        else:
            print(low_msg)
    else:
        if level>100:
            print(high_msg)
        else:
            print(low_msg)
```

How many hours have you fasted: 3
 What is your blood sugar level: 150

You blood sugar level is high.