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

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

Sample output:

```
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.
```

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
```