Session 1: Variables and Statements (Solutions Only)

Q1: What are the types of the following objects? a) `3.1` b) `3.0` c) `'3'` d) `True` e) `print`
Answers: a) float b) float c) str d) bool e) function
Q2: Use trial and error to figure out the meaning of the following operators: a) `**` b) `!=`
Answers: a) exponentiation b) not equal to
Q3: Without using a computer, predict the result of the following expressions. Then check your answers using the computer. a) `5+3**2` b) `5+(6>3)*2` c) `4*(5-(2-1))+(6==1)` d) `2*(2+1)+6/3+2**3` e) `'3'+'2'` f) `'3'+2`
Answers: a) 14 b) 7 c) 16 d) 16 e) '32' f) error (cannot add strings and numbers)
Q4: Without using a computer, predict the final value of x after executing the following sequence.

```
x=3-1
x=x+1
x=2**x
```

Answer: 8
Explanation: x is first set to 2, then becomes 3, then becomes 8.

Q5. Practicing Input and Print

a) Write a program that asks the user for their first name and last name separately, then display their full name as in the sample output.

```
[15]: first=input('Enter first name: ')
      last=input('Enter last name: ')
      print(f'Your full name is {first} {last}.')
```

```
Enter first name: Peng
Enter last name: Shi
Your full name is Peng Shi.
```

b) Write a program that asks the user for the quantity sold and the price per unit and multiply them to calculate the total revenue. (Hint: you need to convert from string to float before multiplying.)

```
[16]: q=float(input('Input quantity sold: '))
      p=float(input('Input the price per unit: '))
      print(f'Total revenue is {p*q}.')
```

```
Input quantity sold: 4
Input the price per unit: 3.5
Total revenue is 14.0.
```

Q6. 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

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

[17]:
```
reward=float(input('Input final cash value: '))
interest=float(input('Input annual interest rate in percent: '))
years=float(input('Input number of years: '))
PV=reward/(1+interest/100)**years
print(f'The present value is ${PV}.')
```

```
Input final cash value: 1000000
Input annual interest rate in percent: 5
Input number of years: 10
The present value is $613913.2535407591.
```