CSIT110 / CSIT810

Python

Lecture 4

Dr. Joseph Tonien

School of Computing and Information Technology
University of Wollongong

Objectives

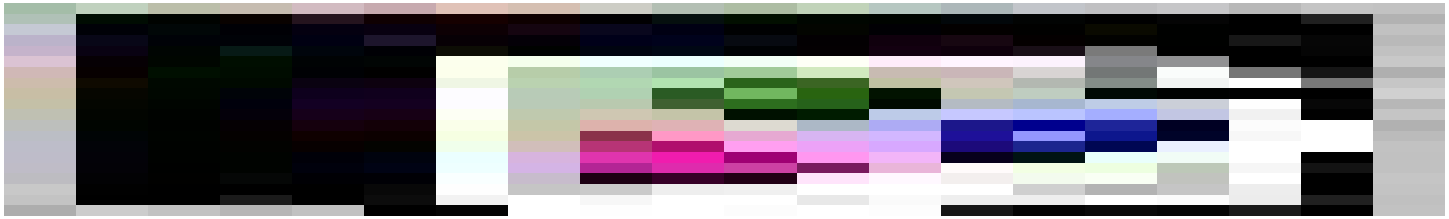
Understanding of:

- User input
- Convert number into string
- Convert string into number
- Rounding off number

Get user input

Get user input

```
first_name = input("Please enter your first name: ")
```



The program will wait for the user to enter a first name. Then whatever the user enters, it will store in the variable `first_name`

Recall the following program

```
first_name = "John"
last_name = "Smith"

full_name = first_name + " " + last_name

print("Your name is " + full_name + ".")
```

Recall the following program

```
first_name = "John"
last_name = "Smith"

full_name = first_name + " " + last_name

print("Your name is " + full_name + ".")
```

Now we want the user to enter the name

A new program with user input

```
first_name = input("Please enter your first name: ")
last_name = input("Please enter your last name: ")

full_name = first_name + " " + last_name

print("Your name is " + full_name + ".")
```

Program output

```
Please enter your first name: Joseph
Please enter your last name: Tonien
Your name is Joseph Tonien.
```

Convert a string into integer

Let's look at the following program

```
num1 = 50
num2 = 16

total = num1 + num2

print("The sum of {0} and {1} is {2}".format(num1, num2, total))
```

Program output

```
The sum of 50 and 16 is 66
```

Let's look at the following program

```
num1 = 50
num2 = 16

total = num1 + num2

print("The sum of {0} and {1} is {2}".format(num1, num2, total))
```

Now we want the user to enter the two integer numbers

What is wrong with the following new program?

```
num1 = input("Enter the first integer: ")
num2 = input("Enter the second integer: ")

total = num1 + num2

print("The sum of {0} and {1} is {2}".format(num1, num2, total))
```

What is wrong with the following new program?

```
num1 = input("Enter the first integer: ")
num2 = input("Enter the second integer: ")

total = num1 + num2

print("The sum of {0} and {1} is {2}".format(num1, num2, total))
```

Program output

```
Enter the first integer: 50
Enter the second integer: 16
The sum of 50 and 16 is 5016
```

What is wrong with the following new program?

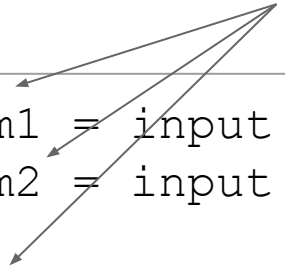
```
num1 = input("Enter the first integer: ")
num2 = input("Enter the second integer: ")

total = num1 + num2

print("The sum of {0} and {1} is {2}".format(num1, num2, total))
```

Program output

```
Enter the first integer: 50
Enter the second integer: 16
The sum of 50 and 16 is 5016
```

User input is always treated as a string!!!

string



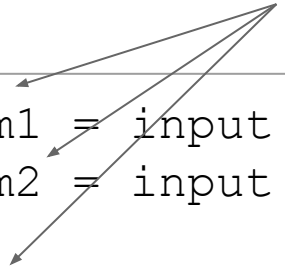
```
num1 = input("Enter the first integer: ")
num2 = input("Enter the second integer: ")

total = num1 + num2

print("The sum of {0} and {1} is {2}".format(num1, num2, total))
```

Program output

```
Enter the first integer: 50
Enter the second integer: 16
The sum of 50 and 16 is 5016
```

User input is always treated as a string!!!

string



```
num1 = input("Enter the first integer: ")
num2 = input("Enter the second integer: ")

total = num1 + num2

print("The sum of {0} and {1} is {2}".format(num1, num2, total))
```

Program output

```
Enter the first integer: 50
Enter the second integer: 16
The sum of 50 and 16 is 5016
```

We need to translate string into integer number

The new program

```
input1 = input("Enter the first integer: ")
num1 = int(input1)

input2 = input("Enter the second integer: ")
num2 = int(input2)

total = num1 + num2

print("The sum of {0} and {1} is {2}".format(num1, num2, total))
```

Program output

```
Enter the first integer: 50
Enter the second integer: 16
The sum of 50 and 16 is 66
```

string integer

```
input1 = input("Enter the first integer: ")
num1 = int(input1)

input2 = input("Enter the second integer: ")
num2 = int(input2)

total = num1 + num2

print("The sum of {0} and {1} is {2}".format(num1, num2, total))
```

Program output

```
Enter the first integer: 50
Enter the second integer: 16
The sum of 50 and 16 is 66
```

string integer

```
input1 = input("Enter the first integer: ")
num1 = int(input1)

input2 = input("Enter the second integer: ")
num2 = int(input2)

total = num1 + num2

print("The sum of {0} and {1} is {2}".format(num1, num2, total))
```

Program output

```
Enter the first integer: 50
Enter the second integer: 16
The sum of 50 and 16 is 66
```

input2

"16"

num2

16

integer

```
input1 = input("Enter the first integer: ")
num1 = int(input1)

input2 = input("Enter the second integer: ")
num2 = int(input2)

total = num1 + num2

print("The sum of {0} and {1} is {2}".format(num1, num2, total))
```

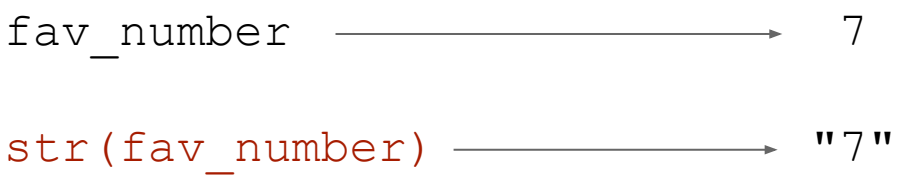
Program output

```
Enter the first integer: 50
Enter the second integer: 16
The sum of 50 and 16 is 66
```

Recall the following program

convert a number to a string

```
fav_number = 7

print("My favorite number is " + str(fav_number))
```



now we can do string concatenation

```
"My favorite number is " + "7"
```

convert a number to a string

```
fav_number  ──────────────────────→  7

str(fav_number)  ──────────────────→  "7"
```

convert a string to an integer

```
input1  ──────────────────────→  "50"

int(input1)  ──────────────────→  50
```

Convert a string into decimal number

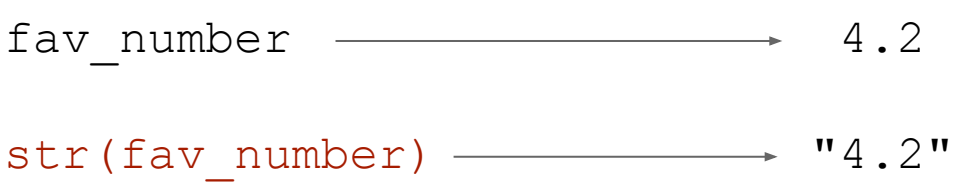
A program to add two decimal numbers

```
input1 = input("Enter the first number: ")
num1 = float(input1)

input2 = input("Enter the second number: ")
num2 = float(input2)

total = num1 + num2

print("The sum of {0} and {1} is {2}".format(num1, num2, total))
```

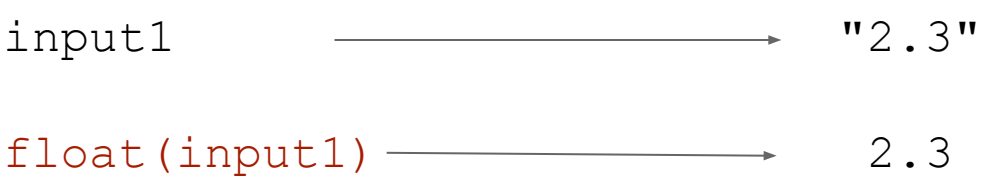
Program output

```
Enter the first number: .4
Enter the second number: 2.1
The sum of 0.4 and 2.1 is 2.5
```

convert a decimal number to a string



convert a string to a decimal number



Rounding numbers

```
input_a = input("Enter number of students with grade A: ")
grade_a = int(input_a)
input_b = input("Enter number of students with grade B: ")
grade_b = int(input_b)
input_c = input("Enter number of students with grade C: ")
grade_c = int(input_c)

total_student = grade_a + grade_b + grade_c
# calculate percentage
pct_a = grade_a * 100 / total_student
pct_b = grade_b * 100 / total_student
pct_c = grade_c * 100 / total_student

print("Total number of students: {0}".format(total_student))
print("Grade statistics: A {0}%, B {1}%, C {2}%".format(pct_a,
pct_b, pct_c))
```

This program calculates the percentages of students receiving grades A, B, and C.

```
input_a = input("Enter number of students with grade A: ")
grade_a = int(input_a)
input_b = input("Enter number of students with grade B: ")
grade_b = int(input_b)
input_c = input("Enter number of students with grade C: ")
grade_c = int(input_c)

total_student = grade_a + grade_b + grade_c
# calculate percentage
pct_a = grade_a * 100 / total_student
pct_b = grade_b * 100 / total_student
pct_c = grade_c * 100 / total_student

print("Total number of students: {0}".format(total_student))
print("Grade statistics: A {0}%, B {1}%, C {2}%".format(pct_a,
pct_b, pct_c))
```

```
Enter number of students with grade A: 15
Enter number of students with grade B: 20
Enter number of students with grade C: 18
Total number of students: 53
Grade statistics: A 28.3018867924528%,
B 37.735849056603776%, C 33.962264150943%
```

```
input_a = input("Enter number of students with grade A: ")
grade_a = int(input_a)
input_b = input("Enter number of students with grade B: ")
grade_b = int(input_b)
input_c = input("Enter number of students with grade C: ")
grade_c = int(input_c)

total_student = grade_a + grade_b + grade_c
# calculate percentage
pct_a = grade_a * 100 / total_student
pct_b = grade_b * 100 / total_student
pct_c = grade_c * 100 / total_student

print("Total number of students: {0}".format(total_student))
print("Grade statistics: A {0}%, B {1}%, C {2}%".format(pct_a,
pct_b, pct_c))
```

We want to round off these numbers

```
Enter number of students with grade A: 15
Enter number of students with grade B: 20
Enter number of students with grade C: 18
Total number of students: 53
Grade statistics: A 28.3018867924528%,
B 37.735849056603776%, C 33.962264150943%
```

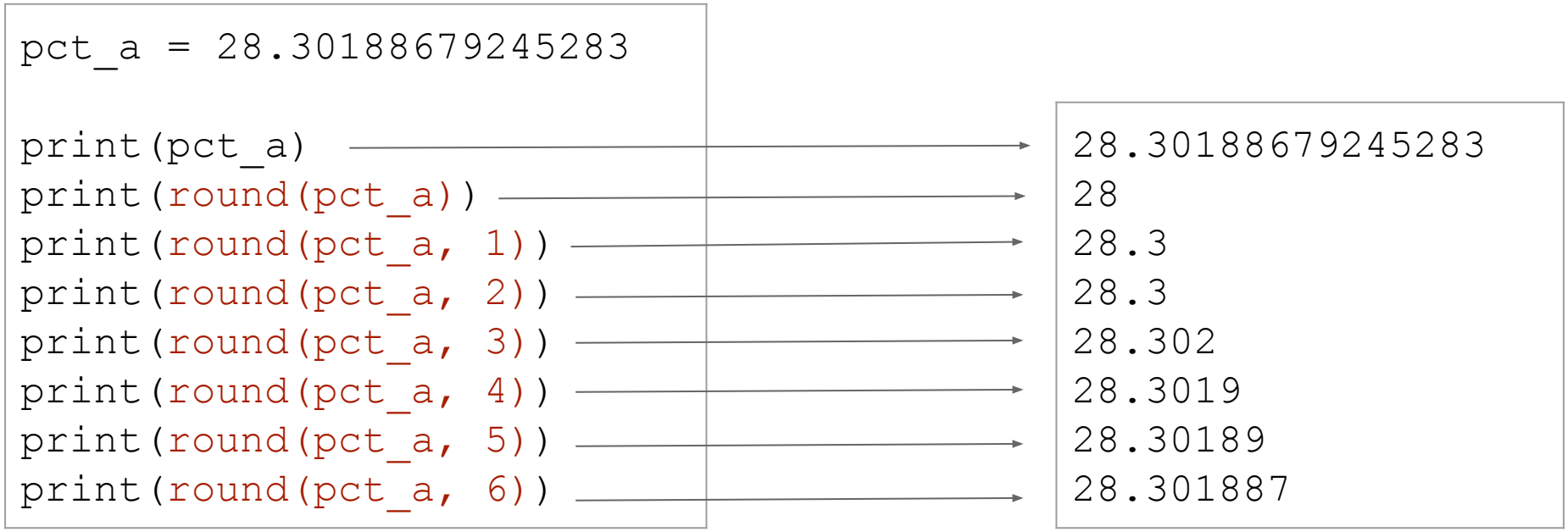
```
input_a = input("Enter number of students with grade A: ")
grade_a = int(input_a)
input_b = input("Enter number of students with grade B: ")
grade_b = int(input_b)
input_c = input("Enter number of students with grade C: ")
grade_c = int(input_c)

total_student = grade_a + grade_b + grade_c
# calculate percentage
pct_a = round(grade_a * 100 / total_student)
pct_b = round(grade_b * 100 / total_student)
pct_c = round(grade_c * 100 / total_student)

print("Total number of students: {0}".format(total_student))
print("Grade statistics: A {0}%, B {1}%, C {2}%".format(pct_a,
pct_b, pct_c))
```

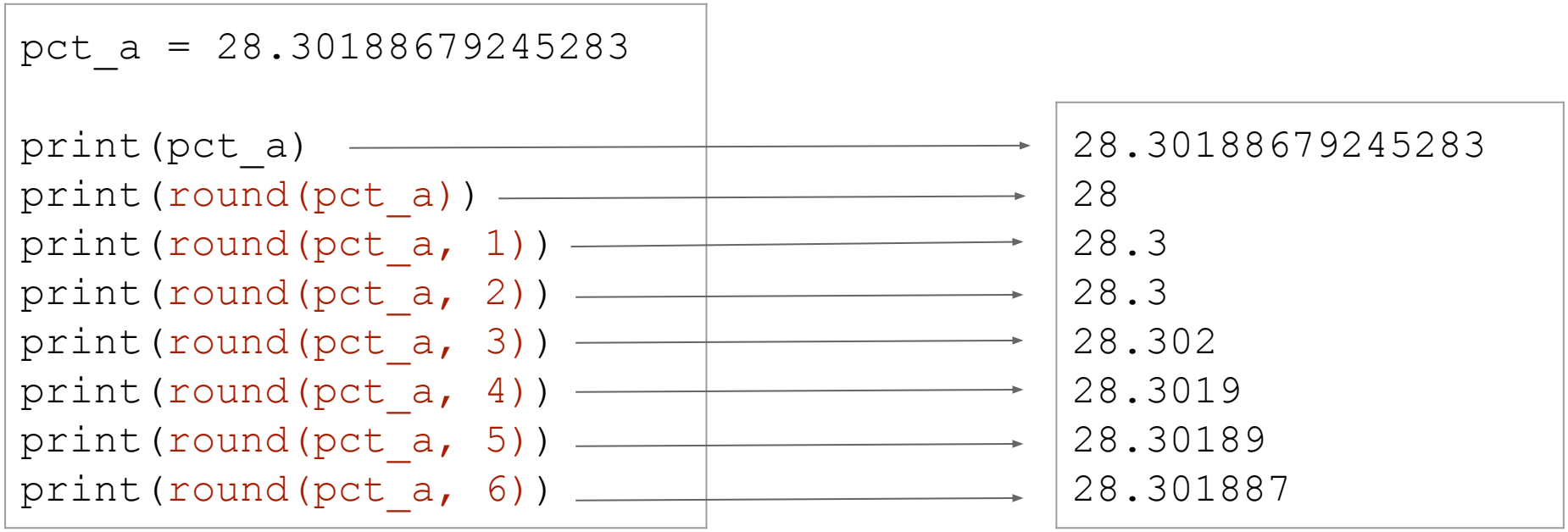
We use the function `round` to round off the numbers

```
input_a = input("Enter number of students with grade A: ")
grade_a = int(input_a)
input_b = input("Enter number of students with grade B: ")
grade_b = int(input_b)
input_c = input("Enter number of students with grade C: ")
grade_c = int(input_c)

total_student = grade_a + grade_b + grade_c
# calculate percentage
pct_a = round(grade_a * 100 / total_student)
pct_b = round(grade_b * 100 / total_student)
pct_c = round(grade_c * 100 / total_student)

print("Total number of students: {0}".format(total_student))
print("Grade statistics: A {0}%, B {1}%, C {2}%".format(pct_a,
pct_b, pct_c))
```

```
Enter number of students with grade A: 15
Enter number of students with grade B: 20
Enter number of students with grade C: 18
Total number of students: 53
Grade statistics: A 28%, B 38%, C 34%
```

Rounding numbers up to a certain number of decimal digits


pct_a = 28.30188679245283
print(pct_a)
print(round(pct_a))
print(round(pct_a, 1))
print(round(pct_a, 2))
print(round(pct_a, 3))
print(round(pct_a, 4))
print(round(pct_a, 5))
print(round(pct_a, 6))
28.30188679245283
28
28.3
28.3
28.302
28.3019
28.30189
28.301887



`round(x, n)`

rounding off number x to n digits from the decimal point

```
input1 = input("Enter assignment 1 mark: ")
a1 = float(input1)

input2 = input("Enter assignment 2 mark: ")
a2 = float(input2)

input3 = input("Enter assignment 3 mark: ")
a3 = float(input3)

# calculate average mark
average = (a1 + a2 + a3)/3

print("Average mark: {0}".format(average))
```

This program calculates assignment average mark

```
input1 = input("Enter assignment 1 mark: ")
a1 = float(input1)

input2 = input("Enter assignment 2 mark: ")
a2 = float(input2)

input3 = input("Enter assignment 3 mark: ")
a3 = float(input3)

# calculate average mark
average = (a1 + a2 + a3)/3

print("Average mark: {0}".format(average))
```

```
Enter assignment 1 mark: 78.5
Enter assignment 2 mark: 60.25
Enter assignment 3 mark: 81.7
Average mark: 73.48333333333333
```

```
input1 = input("Enter assignment 1 mark: ")
a1 = float(input1)

input2 = input("Enter assignment 2 mark: ")
a2 = float(input2)

input3 = input("Enter assignment 3 mark: ")
a3 = float(input3)

# calculate average mark
average = (a1 + a2 + a3)/3

print("Average mark: {0}".format(average))
```

We want to round off the average mark to 2 decimal digits

```
Enter assignment 1 mark: 78.5
Enter assignment 2 mark: 60.25
Enter assignment 3 mark: 81.7
Average mark: 73.48333333333333
```

```
input1 = input("Enter assignment 1 mark: ")
a1 = float(input1)

input2 = input("Enter assignment 2 mark: ")
a2 = float(input2)

input3 = input("Enter assignment 3 mark: ")
a3 = float(input3)

# calculate average mark
average = round((a1 + a2 + a3)/3, 2)

print("Average mark: {0}".format(average))
```

```
input1 = input("Enter assignment 1 mark: ")
a1 = float(input1)

input2 = input("Enter assignment 2 mark: ")
a2 = float(input2)

input3 = input("Enter assignment 3 mark: ")
a3 = float(input3)

# calculate average mark
average = round((a1 + a2 + a3)/3, 2)

print("Average mark: {0}".format(average))
```

```
Enter assignment 1 mark: 78.5
Enter assignment 2 mark: 60.25
Enter assignment 3 mark: 81.7
Average mark: 73.48
```