# Lecture 2

# Lists, conditions, loops

## Programming in geoinformatics

Autumn 2017

 Ask the user for latitude and longitude with raw\_input() and check if they are valid

- Ask the user for latitude and longitude with raw\_input() and check if they are valid
- ② If the value is out of bounds, we **change it** to the nearest valid one:

- Ask the user for latitude and longitude with raw\_input() and check if they are valid
- ② If the value is out of bounds, we **change it** to the nearest valid one:
  - latitude: (-90, 90)

- Ask the user for latitude and longitude with raw\_input() and check if they are valid
- ② If the value is out of bounds, we **change it** to the nearest valid one:
  - latitude: (-90, 90)
  - longitude: (-180, 180)

- Ask the user for latitude and longitude with raw\_input() and check if they are valid
- ② If the value is out of bounds, we **change it** to the nearest valid one:
  - latitude: (-90, 90)
  - longitude: (-180, 180)
- Second Example: 1at = 98 → 90

# DO WE HAVE ENOUGH CARS?

 Assign numeric values to variables carsAmount and peopleAmount

# DO WE HAVE ENOUGH CARS?

- Assign numeric values to variables carsAmount and peopleAmount
- Assume that 5 people fit in a car

# DO WE HAVE ENOUGH CARS?

- Assign numeric values to variables carsAmount and peopleAmount
- Assume that 5 people fit in a car
- Print if you have enough cars for all the people

Write an if statement that will print how flat the terrain is based on the relative elevation change

- Write an **if statement** that will print how flat the terrain is based on the **relative elevation change**
- 2 Terrain types:

- Write an **if statement** that will print how flat the terrain is based on the **relative elevation change**
- Terrain types:
  - $0 300 \rightarrow \mathsf{flats}$

- Write an if statement that will print how flat the terrain is based on the relative elevation change
- Terrain types:
  - ullet 0 300 ightarrow flats
  - $300 800 \rightarrow low hills$

- Write an if statement that will print how flat the terrain is based on the relative elevation change
- Terrain types:
  - ullet 0 300 ightarrow flats
  - $300 800 \rightarrow low hills$
  - ullet 800 1500 ightarrow hills

- Write an if statement that will print how flat the terrain is based on the relative elevation change
- Terrain types:
  - ullet 0 300 ightarrow flats
  - $300 800 \rightarrow low hills$
  - ullet 800 1500 ightarrow hills
  - 1500+ o mountains

① Create the rock, paper, scissors game

- Oreate the rock, paper, scissors game
- 2 Let the user make a choice (get a numerical value -1 = rock, 2 = paper, 3 = scissors)

- Oreate the rock, paper, scissors game
- 2 Let the user make a choice (get a numerical value -1 = rock, 2 = paper, 3 = scissors)
- ① Create a bot variable with a random value: import random bot = random.randint(1,3)

- Oreate the rock, paper, scissors game
- 2 Let the user make a choice (get a numerical value -1 = rock, 2 = paper, 3 = scissors)
- ① Create a bot variable with a random value: import random bot = random.randint(1,3)
- Check who won or if it's a tie

① Calculate the sum of random values in a list that is always 4
or 5 items long:
 from random import random
 numbers = [random(), random(), random(),
 random(), random()]
 or
 numbers = [random(), random(), random(),
 random()]

random()]

Ocalculate the sum of random values in a list that is always 4
or 5 items long:
 from random import random
 numbers = [random(), random(), random(),
 random(), random()]
 or
 numbers = [random(), random(), random(),

use: if condition, len() function and get the items with [] notation

Calculate the sum of random values in a list that is always 4
or 5 items long:
 from random import random
 numbers = [random(), random(), random(),
 random(), random()]
 or
 numbers = [random(), random(), random(),
 random()]

random()]

Ocalculate the sum of random values in a list that is always 4
or 5 items long:
 from random import random
 numbers = [random(), random(), random(),
 random(), random()]
 or
 numbers = [random(), random(), random(),

use: if condition, len() function and get the items with [] notation

Some terminology:

- Some terminology:
  - Point: [4, 16]

Some terminology:

• Point: [4, 16]

• Line: [[1,1], [2,5], [6,8]] (list of points)

- Some terminology:
  - Point: [4, 16]
  - Line: [[1,1], [2,5], [6,8]] (list of points)
  - Multiline: [ [[0, 0], [1, 2]], [[5, 1], [4, 8], [5, 10]], [[1, 1], [5, 4], [8, 10], [6, 1]] ] (list of lines)

- Some terminology:
  - Point: [4, 16]
  - Line: [[1,1], [2,5], [6,8]] (list of points)
  - Multiline: [ [[0, 0], [1, 2]], [[5, 1], [4, 8], [5, 10]], [[1, 1], [5, 4], [8, 10], [6, 1]] | (list of lines)
- Points a..e are defined: a = [47,18]; b = [49,19]; c =
  [48,18]; d= [44, 19]; e= [42, 17]

- Some terminology:
  - Point: [4, 16]
  - Line: [[1,1], [2,5], [6,8]] (list of points)
  - Multiline: [ [[0, 0], [1, 2]], [[5, 1], [4, 8], [5, 10]], [[1, 1], [5, 4], [8, 10], [6, 1]] | (list of lines)
- Points a..e are defined: a = [47,18]; b = [49,19]; c =
  [48,18]; d= [44, 19]; e= [42, 17]
- ③ Create three lines: 11 = [a, d]; 12 = [c, d, b]; 13 =
  [e, a, c]

- Some terminology:
  - Point: [4, 16]
  - Line: [[1,1], [2,5], [6,8]] (list of points)
  - Multiline: [ [[0, 0], [1, 2]], [[5, 1], [4, 8], [5, 10]], [[1, 1], [5, 4], [8, 10], [6, 1]] | (list of lines)
- Points a..e are defined: a = [47,18]; b = [49,19]; c =
  [48,18]; d= [44, 19]; e= [42, 17]
- ③ Create three lines: 11 = [a, d]; 12 = [c, d, b]; 13 =
  [e, a, c]
- Oreate a multiline that contains lines I1, I2, I3

- Some terminology:
  - Point: [4, 16]
  - Line: [[1,1], [2,5], [6,8]] (list of points)
  - Multiline: [ [[0, 0], [1, 2]], [[5, 1], [4, 8], [5, 10]], [[1, 1], [5, 4], [8, 10], [6, 1]] | (list of lines)
- Points a..e are defined: a = [47,18]; b = [49,19]; c =
  [48,18]; d= [44, 19]; e= [42, 17]
- Treate three lines: 11 = [a, d]; 12 = [c, d, b]; 13 =
  [e, a, c]
- Oreate a multiline that contains lines I1, I2, I3
- Calculate centerL1, centerL2, centerL3 with average values of lat and lon of the points in the line



• Polygon is defined just like a line: polygon = [[1,1], [2,5], [6,8]]

- Polygon is defined just like a line: polygon = [[1,1], [2,5], [6,8]]
- Check how many sides it has and print whether:

- Polygon is defined just like a line: polygon = [[1,1], [2,5], [6,8]]
- 2 Check how many sides it has and print whether:
  - it's not a valid polygon (has less than three sides)

- Polygon is defined just like a line: polygon = [[1,1], [2,5], [6,8]]
- Check how many sides it has and print whether:
  - it's not a valid polygon (has less than three sides)
  - it's a triangle

- Polygon is defined just like a line: polygon = [[1,1], [2,5], [6,8]]
- Check how many sides it has and print whether:
  - it's not a valid polygon (has less than three sides)
  - it's a triangle
  - it has four sides

- Polygon is defined just like a line: polygon = [[1,1], [2,5], [6,8]]
- Check how many sides it has and print whether:
  - it's not a valid polygon (has less than three sides)
  - it's a triangle
  - it has four sides
  - it's a more complex polygon