

Introduction to programming by controlling a “Robot”

Overall Goals:

- Attract students into learning programming
- Teach students how to use the Python interactive shell
- Teach students basic python

Learning Outcomes:

By the end of the course, students will be able to:

- Type commands into and receive information from the Python interactive shell
- Invoke functions
- Invoke member methods of objects
- Receive return values from functions and methods
- Create and use tuples
- Use lists
- Write and use basic loops
- Understand integer rounding (rounding towards zero)

What is involved in this course:

Students will use the Python interactive shell to control a robot shown in a GUI (Graphical User Interface) to move around and shoot or tread on targets to destroy them. Students are able to use a variety of functions and methods to manipulate the robot and targets.

How students will achieve the learning outcomes:

- Students will learn how to use the interactive shell as they will need to use it to pass commands or receive output.
- Students will be invoking a function when generating or getting targets.
- Students will be invoking member methods every time they command the robot to do any action.
- Students will have to receive return values in order to aim at targets or move to targets.
- In order to use the target generation with proportion function students will have to learn to create tuples. Students will also have to learn to use tuples when receiving target coordinates or the robot coordinates.
- When getting coordinates of targets students will have to use a list that is provided as the return value in order to utilize the coordinates individually
- In order to effectively destroy large numbers of targets easily, students will be required to use a loop to automatically destroy targets.
- The target generation function uses a proportion which rounds down decimals. Students will be taught how integer rounding works so that this function behaves as expected.

Rough Course Plan:

Students will initially interact with the shell and relay all commands themselves. They will generate the targets, and destroy them using manual commands. They will be taught how to use the basic commands first, and then will be taught the more difficult commands.

After realizing that this is a very tedious process, they will be taught how to use loops to automate the process of destroying targets. This will be the end of the course.