

University of Hull
Department of Computer Science

Wrestling with Python – Week 02
Making a Useful Program

Vsn. 1.0 Rob Miles 2013

Introduction

Welcome to our Python sessions.

Please follow the instructions carefully. You need to enter your programs exactly as they are written, otherwise they will do the wrong thing, or nothing at all.

In this session you will create a useful program that makes decisions based on the input it is given.



This indicates an activity you should perform in at this point in the text. You may be given precise instructions, or you may have to work something out for yourself.

Making Decisions

The program that we wrote last week simply runs to completion. It read in some data, performed a calculation and then printed out the result. In this respect it is working just like a pocket calculator. However, most programs also need to have the ability to make decisions. This is one of the things which makes computers truly useful, in that your program can react to different types of data in an appropriate way.

Cinema Entry Problem

As an example of conditions in action we could consider a program which decides whether or not a particular person is allowed to go and see a film. If the age of the user and the film match up the program will print "Enjoy the film" otherwise it will print out "Access Denied - You are too young". Note that the system does not have any way of verifying the age, we are taking on trust that the user is not telling fibs! The first program we are going to write will perform the test for the film "Rush" which has a minimum age requirement of 15 years. The program will have the following user interface:

```
The film you want to see is Rush  
Enter your age: 21  
Enjoy the film
```

What the user types in is shown as underlined.

Test Data

Before you can be sure that your program will work you must make sure that you have some test data to use with it.



Before you go any further; perform the following:

1. Write down some test data (four values should be sufficient) to make sure that your program works (you should pick values which are close to the test boundary and

others which are not).

Now that you have some test values you can write the code which does the testing for this film. You will need to make use of the Python language construction which can make decisions. Otherwise known as the "if" construction.

Writing a Program

Now you can write the program.



2. Log on to a workstation using the username and password that you were allocated last time.
3. Start the IDLE development environment. (Search for the **IDLE** program and run it)
4. Create a new Program window (**File>New Window**)
5. Use the notepad program to begin to create a program which works as required. A good starting point is to use the sums program that you made last time. That reads in two numbers and does something with them, just like the Cinema program is going to.

Completing the Solution

We can now go ahead and create the complete version of the program. This will print a menu of films from which the user will choose the one they want to see. The user will then enter their age. The program will be used like this:

```
Welcome to our Multiplex
We are presently showing:
  1. Rush (15)
  2. How I Live Now (15)
  3. Thor: The Dark World (12A)
  4. Filth (18)
  5. Planes (U)

Enter the number of the film you wish to see: 1
Enter your age: 12
Access denied - you are too young
```

Your program will have to read and store the number of the required film. It will then read and store the age. You must then use an appropriate arrangement of conditions to decide whether or not the customer can see the film.



- Before you go any further; perform the following:
1. Devise a set of test cases which will allow you to test your program. There should be two test cases per film, one which works and one which does not.
 2. Modify the program so that it works as above and use your test data to prove this.

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