

# Math Quiz

psp-04-01

## 1 Overview

In this lab you are going to be using mathematical operators and if-else-elif statements to extend the functionality of a simple math quiz. You will gain practice performing mathematical operations and determining if the input received from the user is the correct answer.

The following program runs a math quiz consisting of 10 multiplication problems involving operands between 1 and 8:

```
1  from random import randint
2
3  correct = 0
4  for i in range(10):
5      n1 = randint(1, 8)
6      n2 = randint(1, 8)
7      prod = n1 * n2
8
9      ans = input("What's %d times %d?" % (n1, n2))
10     if int(ans) == prod:
11         print("That's right — well done.\n")
12         correct = correct + 1
13     else:
14         print("No, I'm afraid the answer is %d.\n" % prod)
15
16 print ("\nI asked you 10 questions. You got %d of them right."
17       % correct)
18 print ("Well done!")
```

## 2 Learning Outcomes

By the end of this project students should be able to:

- read and write programs with if-elif-else statements;
- read and write programs that use string comparison;

- read and write programs that use mathematical operations;
- work effectively with a partner using pair-programming;
- write an effective report that describes the students' problem solving process.

### 3 Pre-Lab Instructions

**Do this part before you come to lab:**

- Read Problem Space Chapter 4: Compound Expressions
- Review the mathematical operations Python supports:  
[http://en.wikibooks.org/wiki/Python\\_Programming/Basic\\_Math](http://en.wikibooks.org/wiki/Python_Programming/Basic_Math)
- Come up with 5 questions to implement in your math quiz. Write them down and be prepared to show them to the lab aide at the beginning of lab.

### 4 Lab Instructions

**Do this part in lab:**

In this lab you will be improving this quiz.

**Step 1.** Modify the program so that the user can choose how many questions they will be asked.

**Step 2.** Add levels to the program:

- Beginner - each question is chosen at random from addition or subtraction, with operands between 1 and 10
- Intermediate - each question is chosen at random from addition, subtraction, multiplication or division with operands between 1 and 25
- Advanced - each question is one of the 5 questions from your prelab, with operands in a random range that makes sense for the problem
- Let the user choose the level.

**Step 3.** Modify the message at the end so that it says:

- Well done!: if the user answered more than 2/3 of the questions correctly.
- You need more practice: if they get between 1/3 and 2/3 of the questions correct.

- Please ask your math teacher for help!: if they get less than 1/3 of the questions correct.

**Step 4.** Make sure all input choices work regardless of the case (upper/lower) used.

When you have completed the lab run pep8 against your code until all formatting errors have been corrected and your code is PEP 8 compliant. See the Getting Started lab if you need instructions on running the program, or the pep8 documentation found [here](#).

## 5 Lab Report

**Each pair of students will write a single lab report together and each student will turn in that same lab report on BBLearn. Submissions from each student on a pair should be identical.**

Your lab report should begin with a preamble that contains:

- The lab assignment number and name
- Your name(s)
- The date
- The lab section

It should then be followed by four numbered sections:

### 1. Problem Statement

In this section you should describe the problem in **your** own words. The problem statement should answer questions like:

- What are the important features of the problem?
- What are the problem requirements?

This section should also include a reasonably complete list of requirements in the assignment. Following your description of the problem, include a bulleted list of specific features to implement. If there are any specific functions, classes or numeric requirements given to you, they should be represented in this bulleted list.

### 2. Planning

In the second section you should describe what planning you did in order to solve the problem. You should include planning artifacts like sketches, diagrams, or pseudocode you may have used. You should also describe your planning process. List the specific data structures or techniques you plan on using, and why.

### 3. Implementation and Testing

In the third section you should describe how you implemented your plan. As directed by the lab instructor you should (as appropriate) include:

- a copy of your source code (Submitted in BBLearn as a .py file)
- a screen shot of your running application / solution
- results from testing

### 4. Reflection

In the last section you should reflect on the project. Consider different things you could have done to make your solution better. This might include code organization improvements, design improvements, etc.

You should also ask yourself what were the key insights or features of your solution? Were there alternative approaches or techniques you could have employed? How would these alternatives have impacted a different solution?

### 5. Partner Rating

Every assignment you are required to rate your partner with a score -1, 0 or 1. This should be submitted in the comment section of the BBLearn submission, and not in the report document. You do not have to tell your partner the rating you assign them. A rating of 1 indicates that your partner was particularly helpful or contributed exceptional effort. A rating of 0 indicates that your partner met the class expectations of them. Rating your partner at -1 means that they refused contribute to the project, failed to put in a reasonable effort or actively blocked you from participating. If a student receives three ratings of -1 they must attend a mandatory meeting with the instructor to discuss the situation, and receiving additional -1 ratings beyond that, the student risks losing a letter grade, or even failing the course.

## Colophon

This project was developed by Dr. James Dean Palmer of Northern Arizona University. Except as otherwise noted, the content of this document is licensed under the [Creative Commons Attribution-ShareAlike 4.0 International License](#).