COMP 1039

Problem Solving and Programming

Programming Assignment 1

School of Computer and Information Science
The University of South Australia
August 2020

Contents

INTRODUCTION

This document describes the first assignment for Problem Solving and Programming.

The assignment is intended to provide you with the opportunity to put into practice what you have learnt in the course by applying your knowledge and skills to implement a game/puzzle called **Petals Around the Rose.**

This assignment is an **individual task** that will require an **individual submission**. If you are an **internal student,** you will be required to submit your work via learnonline before **Tuesday 1 September, 10.00am.** Internal students are **not** required to demonstrate their work in person.

This document is a kind of specification of the required end product that will be generated by implementing the assignment. Like many specifications, it is written in English and hence will contain some imperfectly specified parts. Please make sure you seek clarification if you are not clear on any aspect of this assignment.

ASSIGNMENT OVERVIEW

Petals Around the Rose

You are required to write a Python program that allows a user to play a game called **Petals Around the Rose.** The program allows the user to repeatedly guess the answer to the puzzle until the user chooses to stop guessing/playing. Once the user chooses to stop guessing, the program will report the user's and game play statistics to the screen. You may like to play a web version of the game: http://www.borrett.id.au/computing/petals-j.htm.

Please ensure that you read the section titled 'Petals Specification' below for further details.

GRADUATE QUALITIES

By undertaking this assessment, you will progress in developing the qualities of a University of South Australia graduate.

The Graduate qualities being assessed by this assignment are:

- The ability to demonstrate and apply a body of knowledge (GQ1) gained from the lectures, workshops, practicals and readings. This is demonstrated in your ability to apply problem solving and programming theory to a practical situation.

- The development of skills required for lifelong learning (GQ2), by searching for information and learning to use and understand the resources provided (Python standard library, lectures, workshops, practical exercises, etc); in order to complete a programming exercise.

- The ability to effectively problem solve (GQ3) using Python to complete the programming problem. Effective problem solving is demonstrated by the ability to understand what is required, utilise the relevant information from lectures, workshops and practical work, write Python code, and evaluate the effectiveness of the code by testing it.

- The ability to work autonomously (GQ4) in order to complete the task.

- The use of communication skills (GQ6) by producing code that has been properly formatted; and writing adequate, concise and clear comments.

- The application of international standards (GQ7) by making sure your solution conforms to the standards presented in the Python Style Guide slides (available on the course website).

PETALS SPECIFICATION

You are required to write a Python program called *yourEmailId*_game.py that allows a user to play a game called **Petals Around the Rose**.

Petals Around the Rose

You are required to write a Python program that allows a player to play **a game of Petals Around the Rose**. The program allows the user to repeatedly guess the answer to the puzzle until the user chooses to stop guessing/playing. Once the user chooses to stop guessing, the program will report the game statistics to the screen. You may also like to read Bill Gates and Petals Around the Rose: http://www.borrett.id.au/computing/petals-bg.htm.

We will be adhering to the following 'Petals Around the Rose' rules and game play for the assignment.

Petals Around the Rose Game Play and Rules:

The name of the game is Petals Around the Rose and the name of the game is important. The computer will roll five dice and ask the user to guess the score for the roll. The score will always be zero or an even number. The user's mission is to work out how the computer calculates the score in order to become a *Potentate of the Rose*.

- To begin, the following instructions are displayed to the screen and the user is asked whether they would like to play Petals Around the Rose, i.e.:

```
Petals Around the Rose
----------------------

The name of the game is 'Petals Around the Rose'.  The name of the
game is important.  The computer will roll five dice and ask you to
guess the score for the roll.  The score will always be zero or an
even number.  Your mission, should you choose to accept it, is to
work out how the computer calculates the score.  If you succeed in
working out the secret and guess correctly five times in a row, you
become a Potentate of the Rose.

Would you like to play Petals Around the Rose [y|n]?
```

If the user enters 'n', the following message is displayed to the screen only:

```
No worries... another time perhaps... :)
```

If the user enters 'y', game play continues as normal.

- Game play is as follows:
- The dice face values are then displayed to the screen and the user is asked to guess the score for the roll, for example:

```
Die 1      Die 2      Die 3      Die 4      Die 5
 [4]        [3]        [2]        [5]        [6]

 * *        *          *          * *        * *
             *                     *         * *
 * *          *          *        * *        * *
```

```
Please enter your guess for the roll:
```

The numbers in the above output will change depending on the dice values rolled.

- If the user guesses correctly, the following message is displayed:

```
Well done! You guessed it!
```

- If the user does not guess correctly one of two possible messages is displayed to the screen. If the user enters an incorrect non-even number, the following message is displayed to the screen, for example:

```
No sorry, it's 0 not 9. The score is always even.
```

If the user enters an incorrect even number, the following message is displayed to the screen, for example:

```
No sorry, it's 0 not 6.
```

The numbers in the above output will change depending on what the user has entered and the score value for the roll.

- The user is then asked whether they would like to play again with the following prompt. Game play continues while the user enters 'y' at the prompt:

```
Roll dice again [y|n]?
```

- If the user has five (5) **incorrect** guesses **in a row** the following message is displayed to the screen:

```
Hint: The name of the game is important... Petals Around the Rose.
```

- If the user has five (5) **correct** guesses **in a row**, the following message is displayed to the screen:

```
Congratulations! You have worked out the secret!
Make sure you don't tell anyone!
```

- Game play continues until the user chooses to quit, i.e. enters 'n' at the following prompt:

```
Roll dice again [y|n]?
```

- The solution or formula for Petals Around the Rose can be found here:

  https://en.wikipedia.org/wiki/Petals_Around_the_Rose

  The key to working out the answer is given by the name of the puzzle, where the “rose” is the centre dot that appears only on the 3 and 5 faces of a die, while the “petals” are the dots which surround the centre dot. Therefore, the result can be calculated by counting 2 for each 3 face and 4 for each 5 face. In the example provided above, there is one 5 face and one 3 face, so the result is four plus two, resulting in a total of six.

- Once the user chooses to quit (after having played at least one game), game summary and statistics are displayed to the screen, for example:

```
Game Summary
============

You played 2 games:
  |--> Number of correct guesses:     1
  |--> Number of incorrect guesses:   1


Dice Roll Stats:

Face  Frequency
   1  *
   2  ***
   3  *
   4  *
   5  **
   6  **

Thanks for playing!
```

The numbers in the above output will change depending on the results of the user's games and the dice values rolled. The above should not be displayed if the user has not played any games.

You do not have to write the code that displays the die face values to the screen, a module containing a function that does that for you has been provided. The **`dice.py`** file is a module that contains a function called **`display_dice()`** that displays the face values of the dice to the screen for you. You are required to use this as part of this assignment, however, **please do not modify the `dice.py` file.**

PRACTICAL REQUIREMENTS

It is recommended that you develop this part of the assignment in the suggested stages.

It is expected that your solution WILL include the use of:

- Your solution in one file called *`yourEmailId`*`_petals.py`.
- Appropriate and well constructed `while` and/or `for` loops (as necessary).
- Appropriate `if, if-else, if-elif-else` statements (as necessary).
- The supplied `dice.py` module (containing the `display_dice` function). This is provided for you – **please DO NOT modify this file**.
- The use of the `random.randint(1,6)` function in order to simulate the roll of a six sided die.
- The use of a **list** in order to keep track of dice roll statistics (how many times each die face value was rolled) and **nested loops** in order to display the dice roll statistics to the screen.
- Output that **strictly** adheres to the assignment specifications. If you are not sure about these details, you should check with the 'Sample Output' provided at the end of this document or post a message to the discussion forum for clarification.
- Good programming practice:
    - Consistent commenting, layout and indentation. You are to provide comments to describe: your details, program description, all variable definitions, and every significant section of code.
    - Meaningful variable names (no single letter identifier names).

Your solution **MAY** make use of the following:

- Any of the Python built-in functions.
- Access the individual elements in a list with an index (one element only). i.e. `list_name[index]`.

Your solutions **MUST NOT** use:

- `break`, or `continue` statements in your solution. **Do not** use the `quit()` or `exit()` functions or the `break` or `return` statements (or any other techniques) as a way to break out of loops. Doing so will result in a significant mark deduction.
- Your own (user-defined) functions.

PLEASE NOTE: You are reminded that you should ensure that all input and output conform to the specifications listed here; if you are not sure about these details you should check with the sample output provided at the end of this document or post a message to the discussion forum in order to seek clarification.

Please ensure that you use Python 3.8.3 or a later version (i.e. the latest version) in order to complete your assignments. Your programs **MUST** run using Python 3.8.3 (or latest version).

STAGES

It is recommended that you develop this part of the assignment in the suggested stages. Many problems in later stages are due to errors in early stages. **Make sure you have finished and thoroughly tested each stage before continuing.**

The following stages of development are recommended:

Stage 1

You will need the `dice.py` file for this assignment. This has been provided for you. Please download this file from the course website (Assessments tab) and ensure that it is in the same directory as the *`yourEmailId`*`_petals.py` file.

Test to ensure that this is working correctly by entering the following in your *`yourEmailId`*`_petals.py` file:

```
import dice


dice.display_dice(2,3,4,5,6)
```

Run the *`yourEmailId`*`_petals.py` file. If this is working correctly, you should now see the following output in the Python shell when you run your program:

```
Die 1     Die 2     Die 3     Die 4     Die 5
 [2]       [3]       [4]       [5]       [6]

 *         *         * *       * *       * *
            *                   *        * *
   *         *       * *       * *       * *
```

Note, this is for developmental purposes only, and you will need to modify and correctly position the above code.

Make sure the program runs correctly. Once you have that working, back up your program. *Note: When developing software, you should always have fixed points in your development where you know your software is bug free and runs correctly.*

Stage 2

Add code to simulate the rolling of five dice. Use the `random.randint(1,6)` function to simulate the roll of a die.

Modify your code to now display the randomly generated dice roll to the screen, for example, if your variables (that store the randomly generated die rolls) are called die1, die2, die3, die4, and die5, you would then modify the code from stage one so that the randomly generated values are passed to the function instead, like so:

```
# Place code to randomly generate the roll of five dice here…
:
:
dice.display_dice(die1, die2, die3, die4, die5)
```

Sample output (this will look different given we are generating random values here):

```
Die 1     Die 2     Die 3     Die 4     Die 5
 [3]       [6]       [4]       [6]       [1]

 *         * *       * *       * *
  *        * *                 * *        *
   *       * *       * *       * *
```

Stage 3

Add code to prompt for and read the user's guess (i.e. the score guess for the roll) and display an appropriate message to the screen depending on the user's input. For example

- If the user guesses correctly, the following message is displayed:

  ```
  Well done! You guessed it!
  ```

- If the user enters an incorrect non-even number, the following message is displayed to the screen, for example:

  ```
  No sorry, it's 0 not 9. The score is always even.
  ```

- If the user enters an incorrect even number, the following message is displayed to the screen, for example:

  ```
  No sorry, it's 0 not 6.
  ```

  The numbers in the above output examples will change depending on what the user has entered and the score value for the roll.

Sample output 1:

```
Die 1     Die 2     Die 3     Die 4     Die 5
 [5]       [4]       [6]       [2]       [4]

* *       * *       * *       *         * *
 *                  * *
* *       * *       * *         *       * *



Please enter your guess for the roll: 4

Well done! You guessed it!
```

Display the user's guess, the actual score and appropriate message to the screen as seen below:

Sample output 2:

```
Die 1     Die 2     Die 3     Die 4     Die 5
 [3]       [6]       [3]       [4]       [1]

 *         * *       *         * *
  *        * *        *                   *
   *       * *         *       * *



Please enter your guess for the roll: 7

No sorry, it's 4 not 7. The score is always even.
```

Sample output 3:

```
     Die 1     Die 2     Die 3     Die 4     Die 5
      [4]       [5]       [5]       [2]       [6]

      * *       * *       * *       *         * *
                 *         *                   * *
      * *       * *       * *         *       * *



Please enter your guess for the roll: 4

No sorry, it's 8 not 4.
```

Stage 4

Now… it's time to allow the player to play more than one game. Let's add a loop that loops until the user either enters 'n' (to quit the game). Think about where this code should go – what needs to be repeated, etc.

Sample output:

```
Would you like to play Petals Around the Rose [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [3]       [2]       [4]       [1]       [5]

      *         *         * *                 * *
       *                                     *
        *         *       * *                 * *



Please enter your guess for the roll: 6

Well done! You guessed it!


Roll dice again [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [6]       [2]       [4]       [3]       [3]

      * *       *         * *       *         *
      * *                             *         *
      * *         *       * *         *         *



Please enter your guess for the roll: 3

No sorry, it's 4 not 3. The score is always even.


Roll dice again [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [2]       [4]       [6]       [6]       [6]

      *         * *       * *       * *       * *
                          * *       * *       * *
        *       * *       * *       * *       * *
```

```
Please enter your guess for the roll: 8

No sorry, it's 0 not 8.


Roll dice again [y|n]? n
```

Stage 5

Add code to keep track of how many games were played, the number of correct guesses and the number of incorrect guesses. Display this to the screen as seen in the sample output.

Stage 6

Add code to keep track of how many correct and incorrect guesses are recorded in a row and display the appropriate messages to the screen (only if **five in a row** are achieved) as seen in the sample output.

Stage 7

Add code to validate the following user input only:

- Would you like to play Petals Around the Rose [y|n]?

  Sample output:
  ```
  Would you like to play Petals Around the Rose [y|n]? w
  Please enter either 'y' or 'n'.

  Would you like to play Petals Around the Rose [y|n]? y
  ```

- Roll dice again [y|n]?

  Sample output:
  ```
  Roll dice again [y|n]? z
  Please enter either 'y' or 'n'.

  Roll dice again [y|n]? y
  ```

Stage 8

Add code to keep track of dice roll statistics. That is, how many times each die face value was rolled. Display this information to the screen (as seen in the sample output). You **MUST** use a list in order to store this information. You **MUST** also use nested loops in order to display this information.

To define a list in order to store dice roll stats:

```
die_count = [0,0,0,0,0,0,0]
```

die_count

0	0	0	0	0	0	0
0	1	2	3	4	5	6

Given that die face values are 1 – 6 inclusive, we create a list with seven elements but ignore the zero element of the list. This will make it easier to increment the appropriate list element.

To access and update the appropriate list element (using die value as an index):

```
die1 = random.randint(1,6)
die_count[die1] = die_count[die1] + 1
```

For example: If die1 is assigned the value 3.

die_count

0	0	0	1	0	0	0
0	1	2	3	4	5	6

Algorithm to display the frequency to the screen:

```
index = 1
WHILE index < length of die_count list
    display die face value to the screen (value of index)

    FOR number in 0 to die_count[index]
        display one star to the screen

    increment index by 1
```

Stage 9 – THIS IS IMPORTANT!

Finally, check the **sample output (see section titled 'Sample Output') and if necessary, modify your code so that:**

- The output produced by your program **EXACTLY** matches the sample output provided.
- Your program **EXACTLY** behaves as described in these specs **and** the sample output provided.

SUBMISSION DETAILS

You are required to do the following in order to submit your work and have it marked:

- You are required to submit an electronic copy of your program via learnonline **before Tuesday 1 September, 10.00 am.**

All students must follow the submission instructions below:

Ensure that your files are named correctly (as per instructions outlined in this document).

Ensure that the following files are included in your submission:

- `yourEmailId_petals.py`

For example:

- `bonjy007_petals.py`

All files that you submit must include the following comments.

```
#
# File: fileName.py
# Author: your name
# Email Id: your email id
# Description: Assignment 1 – place assignment description here…
# This is my own work as defined by the University's
# Academic Misconduct policy.
#
```

Assignments that do not contain these details may not be marked.

You must have submitted your program **before the online due date.** Work that has not been correctly submitted to learnonline will not be marked.

It is expected that students will make copies of all assignments and be able to provide these if required.

EXTENSIONS AND LATE SUBMISSIONS

There will be **no** extensions/late submissions for this course without one of the following exceptions:

1. A medical certificate is provided that has the timing and duration of the illness and an opinion on how much the student's ability to perform has been compromised by the illness. **Please note** if this information is not provided the medical certificate WILL NOT BE ACCEPTED. Late assessment items will not be accepted unless a medical certificate is presented to the Course Coordinator. The certificate must be produced as soon as possible and must cover the dates during which the assessment was to be attempted. In the case where you have a valid medical certificate, the due date will be extended by the number of days stated on the certificate up to five working days.
2. A Learning and Teaching Unit councillor contacts the Course Coordinator on your behalf requesting an extension. Normally you would use this if you have events outside your control adversely affecting your course work.
3. Unexpected work commitments. In this case, you will need to attach a letter from your work supervisor with your application stating the impact on your ability to complete your assessment.
4. Military obligations with proof.

Applications for extensions must be lodged via learnonline before the due date of the assignment.

Note: Equipment failure, loss of data, 'Heavy work commitments' or late starting of the course are not sufficient grounds for an extension.

ACADEMIC MISCONDUCT

ACADEMIC MISCONDUCT

Students are reminded that they should be aware of the academic misconduct guidelines available from the University of South Australia website.

Deliberate academic misconduct such as plagiarism is subject to penalties. Information about Academic integrity can be found in Section 9 of the *Assessment policies and procedures manual* at:
http://www.unisa.edu.au/policies/manual/

MARKING CRITERIA

University of South Australia

Assessment feedback

Problem Solving and Programming (COMP 1039)
Assignment – Part 1 - Weighting: 15% - Due: Week 6, 2020

NAME:	MAX MARK	MARK	COMMENT
PRODUCES CORRECT RESULTS (OUTPUT)	20 marks		☐ -2 No or incorrect line spacing

```
File     : waybyO01_petals.py
Author   : Batman
Email ID : waybyO01
This is my own work as defined by the University's
Academic Misconduct Policy.

Petals Around the Rose
----------------------

The name of the game is 'Petals Around the Rose'.  The name of the
game is important.  The computer will roll five dice and ask you to
guess the score for the roll.  The score will always be zero or an
even number.  Your mission, should you choose to accept it, is to
work out how the computer calculates the score.  If you succeed in
working out the secret and guess correctly five times in a row, you
become a Potentate of the Rose.

Would you like to play Petals Around the Rose [y|n]? y
```

☐ -1 No or incorrect instructions display

☐ -1 No or incorrect prompt ['y' or 'n']

```
     Die 1     Die 2     Die 3     Die 4     Die 5   [2 marks]
      [1]       [6]       [3]       [3]       [1]

                * *       *         *
       *        * *       *         *         *
                * *         *       *
```

☐ -1 No or incorrect dice display

```
Please enter your guess for the roll: 4
```

☐ -1 No or incorrect guess prompt

```
Well done! You guessed it!                          [2 marks]
```

☐ -1 No or incorrect outcome msg (see below for all msgs)

```
Roll dice again [y|n]? n                            [2 marks]
```

☐ -1 No or incorrect prompt ['y' or 'n']

```
Game Summary                                        [2 marks]
============

You played 1 games:
  |--> Number of correct guesses:      1
  |--> Number of incorrect guesses:    0


Dice Roll Stats:

Face  Frequency                                     [2 marks]
   1  **
   2
   3  **
   4
   5
   6  *

Thanks for playing!
-------------------------------------------------------------------------------
No worries... another time perhaps... :)
```

☐ -1 No or incorrect summary title
☐ -1 No or incorrect summary layout
☐ -1 No or incorrect played msg & value
☐ -1 No or incorrect correct msg & val
☐ -1 No or incorrect incorrect msg & val

☐ -1 No or incorrect roll stats title

☐ -1 No or incorrect face & freq title

☐ -1 No or incorrect dice stats layout
☐ -1 No or incorrect dice stats values

☐ -1 No or incorrect thanks message

☐ -1 No or incorrect another time msg

Incorrect even score guess test:

```
No sorry, it's 10 not 8.
```

☐ -1 No or incorrect even score msg

Incorrect odd score guess test:

```
No sorry, it's 2 not 3. The score is always even.
```

☐ -1 No or incorrect odd score msg

Five (5) incorrect guesses in a row test:

```
Hint: The name of the game is important... Petals
Around the Rose.
```

☐ -1 No or incorrect 5 in row msg

Five (5) correct guesses in a row test:

```
Congratulations! You have worked out the secret!
Make sure you don't tell anyone!
```

☐ -1 No or incorrect 5 in row msg

ADHERES TO SPECIFICATIONS (CODE) Use of `random.randint(1,6)` to simulate die roll Use of `dice.py` file and function `display_dice(d1, d2, d3, d4, d5)`. While loop for repeated play (play == 'y' or equivalent) Appropriate if statements (general) List to store die count information Nested loops to display die count information to the screen Validate user input – messages `Please enter either 'y' or 'n'.` Good loops (i.e. no `break, exit` or `return` statements (or similar) to exit loops).			☐ -2 No or incorrect use of `randint` ☐ -2 No or incorrect module/function use ☐ -2 No or incorrect play again loop ☐ -2 No or incorrect if statements ☐ -2 No or incorrect use of List ☐ -2 No or incorrect nested loops ☐ -2 No validation of user input ☐ -2 For using break/return/exit statements to exit loops ☐ -4 if used user-defined functions
STYLE Comments (your details, program description, all variable definitions, functions and significant sections of code). Consistent code layout and indentation. Meaningful variable names (no single letter variable names).	5 marks		☐ -2 Insufficient comments ○ your details at top of file, ○ program description, ○ all variable definitions, ○ significant sections of code ☐ -2 Inconsistent indentation and layout ☐ -2 Non-descriptive variable names
TOTAL	**25 MARKS**		

The Graduate qualities being assessed by this assignment are indicated by an X:

x	GQ1: operate effectively with and upon a body of knowledge	x	GQ5: are committed to ethical action and social responsibility
x	GQ2: are prepared for lifelong learning		GQ6: communicate effectively
x	GQ3: are effective problem solvers	x	GQ7: demonstrate an international perspective
x	GQ4:can work both autonomously and collaboratively		

This form meets the 2006 requirements of UniSA's Code of Good Practice: Student Assessment

Possible deductions:

- *Programming style:* Things to watch for are poor or no commenting, poor variable names, etc.
- *Submitted incorrectly:* -5 marks if assignment is submitted incorrectly (i.e. not adhering to the specs).

SAMPLE OUTPUT

Sample output 1:

```
File     : wayby001_petals.py
Author   : Batman
Email ID : wayby001
This is my own work as defined by the University's Academic Misconduct Policy.


Petals Around the Rose
----------------------

The name of the game is 'Petals Around the Rose'.  The name of the
game is important.  The computer will roll five dice and ask you to
guess the score for the roll.  The score will always be zero or an
even number.  Your mission, should you choose to accept it, is to
work out how the computer calculates the score.  If you succeed in
working out the secret and guess correctly five times in a row, you
become a Potentate of the Rose.

Would you like to play Petals Around the Rose [y|n]? n


No worries... another time perhaps... :)
```

Sample output 2:

```
File     : wayby001_petals.py
Author   : Batman
Email ID : wayby001
This is my own work as defined by the University's Academic Misconduct Policy.


Petals Around the Rose
----------------------

The name of the game is 'Petals Around the Rose'.  The name of the
game is important.  The computer will roll five dice and ask you to
guess the score for the roll.  The score will always be zero or an
even number.  Your mission, should you choose to accept it, is to
work out how the computer calculates the score.  If you succeed in
working out the secret and guess correctly five times in a row, you
become a Potentate of the Rose.

Would you like to play Petals Around the Rose [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [2]       [1]       [6]       [5]       [2]

      *                   * *       * *       *
                  *       * *        *
        *                 * *       * *         *



Please enter your guess for the roll: 4

Well done! You guessed it!


Roll dice again [y|n]? n


Game Summary
============

You played 1 games:
  |--> Number of correct guesses:      1
  |--> Number of incorrect guesses:    0


Dice Roll Stats:

Face  Frequency
   1  *
   2  **
```

```
   3
   4
   5  *
   6  *

Thanks for playing!
```

Sample output 3:

```
File     : wayby001_petals.py
Author   : Batman
Email ID : wayby001
This is my own work as defined by the University's Academic Misconduct Policy.


Petals Around the Rose
----------------------

The name of the game is 'Petals Around the Rose'.  The name of the
game is important.  The computer will roll five dice and ask you to
guess the score for the roll.  The score will always be zero or an
even number.  Your mission, should you choose to accept it, is to
work out how the computer calculates the score.  If you succeed in
working out the secret and guess correctly five times in a row, you
become a Potentate of the Rose.

Would you like to play Petals Around the Rose [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [1]       [6]       [2]       [6]       [2]

                * *       *         * *       *
       *        * *                 * *
                * *         *       * *         *



Please enter your guess for the roll: 3

No sorry, it's 0 not 3. The score is always even.


Roll dice again [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [3]       [4]       [3]       [3]       [3]

      *         * *       *         *         *
       *                  *         *         *
        *       * *         *         *         *



Please enter your guess for the roll: 8

Well done! You guessed it!


Roll dice again [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [2]       [1]       [5]       [1]       [4]

      *                   * *                 * *
                 *         *         *
        *                  * *                 * *



Please enter your guess for the roll: 2

No sorry, it's 4 not 2.


Roll dice again [y|n]? n


Game Summary
============
```

```
You played 3 games:
  |--> Number of correct guesses:      1
  |--> Number of incorrect guesses:    2


Dice Roll Stats:

Face  Frequency
   1  ***
   2  ***
   3  ****
   4  **
   5  *
   6  **

Thanks for playing!
```

Sample output 4:

```
File     : wayby001_petals.py
Author   : Batman
Email ID : wayby001
This is my own work as defined by the University's Academic Misconduct Policy.


Petals Around the Rose
----------------------

The name of the game is 'Petals Around the Rose'.  The name of the
game is important.  The computer will roll five dice and ask you to
guess the score for the roll.  The score will always be zero or an
even number.  Your mission, should you choose to accept it, is to
work out how the computer calculates the score.  If you succeed in
working out the secret and guess correctly five times in a row, you
become a Potentate of the Rose.

Would you like to play Petals Around the Rose [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [3]       [3]       [5]       [6]       [3]

      *         *         * *       * *       *
       *         *         *        * *        *
        *         *       * *       * *         *



Please enter your guess for the roll: 3

No sorry, it's 10 not 3. The score is always even.


Roll dice again [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [2]       [1]       [6]       [6]       [3]

      *                   * *       * *       *
                  *       * *       * *        *
        *                 * *       * *         *



Please enter your guess for the roll: 4

No sorry, it's 2 not 4.


Roll dice again [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [3]       [1]       [5]       [2]       [1]

      *                   * *       *
       *         *         *                   *
        *                 * *         *



Please enter your guess for the roll: 7
```

```
No sorry, it's 6 not 7. The score is always even.


Roll dice again [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [4]       [4]       [5]       [3]       [3]

      * *       * *       * *       *         *
                          *         *         *
      * *       * *       * *         *         *


Please enter your guess for the roll: 6

No sorry, it's 8 not 6.


Roll dice again [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [5]       [1]       [6]       [3]       [1]

      * *                 * *       *
       *         *        * *        *         *
      * *                 * *         *


Please enter your guess for the roll: 10

No sorry, it's 6 not 10.


Hint: The name of the game is important... Petals Around the Rose.


Roll dice again [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [2]       [3]       [1]       [6]       [5]

      *         *                   * *       * *
                 *         *        * *        *
        *         *                 * *       * *


Please enter your guess for the roll: 6

Well done! You guessed it!


Roll dice again [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [1]       [2]       [4]       [6]       [5]

                *         * *       * *       * *
       *                            * *        *
                   *       * *       * *       * *


Please enter your guess for the roll: 12

No sorry, it's 4 not 12.


Roll dice again [y|n]? n


Game Summary
============

You played 7 games:
```

```
  |--> Number of correct guesses:      1
  |--> Number of incorrect guesses:    6


Dice Roll Stats:

Face  Frequency
   1  *******
   2  ****
   3  *********
   4  ***
   5  ******
   6  ******

Thanks for playing!
```

Sample output 5:

```
File     : wayby001_petals.py
Author   : Batman
Email ID : wayby001
This is my own work as defined by the University's Academic Misconduct Policy.


Petals Around the Rose
----------------------

The name of the game is 'Petals Around the Rose'.  The name of the
game is important.  The computer will roll five dice and ask you to
guess the score for the roll.  The score will always be zero or an
even number.  Your mission, should you choose to accept it, is to
work out how the computer calculates the score.  If you succeed in
working out the secret and guess correctly five times in a row, you
become a Potentate of the Rose.

Would you like to play Petals Around the Rose [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [3]       [4]       [1]       [6]       [5]

      *         * *                 * *       * *
       *                  *        * *        *
        *       * *                 * *       * *



Please enter your guess for the roll: 6

Well done! You guessed it!


Roll dice again [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [3]       [5]       [6]       [3]       [2]

      *         * *       * *       *         *
       *         *        * *        *
        *       * *       * *         *         *



Please enter your guess for the roll: 3

No sorry, it's 8 not 3. The score is always even.


Roll dice again [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [5]       [4]       [5]       [2]       [3]

      * *       * *       * *       *         *
       *                  *                   *
      * *       * *       * *         *         *



Please enter your guess for the roll: 10
```

```
Well done! You guessed it!


Roll dice again [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [5]       [3]       [5]       [2]       [3]

      * *       *         * *       *         *
       *         *         *                   *
      * *         *       * *         *         *



Please enter your guess for the roll: 12

Well done! You guessed it!


Roll dice again [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [5]       [2]       [6]       [4]       [5]

      * *       *         * *       * *       * *
       *                  * *                   *
      * *         *       * *       * *       * *



Please enter your guess for the roll: 8

Well done! You guessed it!


Roll dice again [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [4]       [3]       [3]       [5]       [2]

      * *       *         *         * *       *
                 *         *         *
      * *         *         *       * *         *



Please enter your guess for the roll: 8

Well done! You guessed it!


Roll dice again [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [4]       [1]       [2]       [1]       [2]

      * *                 *                   *
                 *                   *
      * *                   *                   *



Please enter your guess for the roll: 0

Well done! You guessed it!


Congratulations! You have worked out the secret!
Make sure you don't tell anyone!


Roll dice again [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [5]       [5]       [3]       [4]       [1]
```

```
      * *       * *       *         * *
       *         *         *                   *
      * *       * *         *       * *


Please enter your guess for the roll: 2

No sorry, it's 10 not 2.


Roll dice again [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [2]       [1]       [6]       [5]       [6]

      *                   * *       * *       * *
                  *       * *         *       * *
        *                 * *       * *       * *



Please enter your guess for the roll: 4

Well done! You guessed it!


Roll dice again [y|n]? n


Game Summary
============

You played 9 games:
  |--> Number of correct guesses:      7
  |--> Number of incorrect guesses:    2


Dice Roll Stats:

Face  Frequency
   1  *****
   2  ********
   3  *********
   4  ******
   5  ************
   6  *****

Thanks for playing!
```

Sample output 6:

```
File     : wayby001_petals.py
Author   : Batman
Email ID : wayby001
This is my own work as defined by the University's Academic Misconduct Policy.


Petals Around the Rose
----------------------

The name of the game is 'Petals Around the Rose'.  The name of the
game is important.  The computer will roll five dice and ask you to
guess the score for the roll.  The score will always be zero or an
even number.  Your mission, should you choose to accept it, is to
work out how the computer calculates the score.  If you succeed in
working out the secret and guess correctly five times in a row, you
become a Potentate of the Rose.

Would you like to play Petals Around the Rose [y|n]? p
Please enter either 'y' or 'n'.

Would you like to play Petals Around the Rose [y|n]? y


     Die 1     Die 2     Die 3     Die 4     Die 5
      [4]       [3]       [4]       [1]       [1]

      * *       *         * *
                 *                   *         *
      * *         *       * *
```

```
Please enter your guess for the roll: 2

Well done! You guessed it!


Roll dice again [y|n]? z
Please enter either 'y' or 'n'.

Roll dice again [y|n]? n


Game Summary
============

You played 1 games:
  |--> Number of correct guesses:      1
  |--> Number of incorrect guesses:    0


Dice Roll Stats:

Face  Frequency
   1  **
   2
   3  *
   4  **
   5
   6

Thanks for playing!
```