

Computing Summer Work 2018

Task:

For this summer project you need to showcase a range of Python and logical thinking skills to try and solve an example tasks from an old GCSE Computing controlled assessment. This project is designed to highlight your resourceful and problem solving skills, while encouraging you to solve a solution through research and investigation.

Remember to use the internet and websites such as YouTube if you need to learn any additional Python skills.

Make sure you are using **Python 3** as this is what we use in school and you will be using throughout the course.

Presenting the work:

You do not need to write up your solutions in any way, you simply just need the physical Python code files which we will look at in term 1.

Expectations:

GCSE Computing Students:

At a minimum task 1 and 2 should be a working solution, with evidence of task 3 being attempted and explored. You should be encouraged to make use of functions in these tasks.

None GCSE Computing students:

If you have not studied Computer Science at GCSE you are only expected to have a partial working solution for task 1 and 2, however it is encouraged that you attempt all tasks if you feel confident.

Help:

If you haven't used Python before, it is recommended that you seek out some tutorials before attempting the task.

- Video Tutorials – Sites > ICT > Videos > Python video tutorials
- <https://www.codecademy.com/>
- Use YouTube tutorials – there are lots out there!

Task 1 Simulating a dice

A game uses dice with 4, 6 and 12 sides to determine various outcomes.

Design, code and test a program that will simulate throwing dice with these numbers of sides.

The user should be able to input which dice is being thrown, eg 4, 6 or 12.

The program should output the dice chosen and the score,
for example '6 sided dice thrown, score 4'

The user should be able to repeat this process as many times as required.

Task 2 Determining a character's attributes

When determining certain characteristics of a game character the numbers on a combination of dice are used to calculate certain attributes.

Two of these attributes are strength and skill.

At the start of the game, when the characters are created, a 4 sided dice and a 12 sided dice are thrown to determine values for each of these attributes using the following method for each character:

- Each attribute is initially set to 10.
- The score on the 12 sided dice is divided by the score on the 4 sided dice and rounded down.
- This value is added to the initial value.

This process is repeated for each attribute for each character.

Describe this process using a suitable algorithm.

Write and test the code to determine these two attributes for a character and store the sample data for two characters, including suitable names, in a file.

Task 3 Determining the outcome of an encounter

When there is an encounter between two characters the outcome is determined by the following process:

- The differences between the strength attributes for the two characters is calculated
- This difference is divided by 5 and then rounded down to create a 'strength modifier'
- The process is repeated for the skill attribute to create a 'skill modifier'
- Each player throws a 6 sided dice.
 - If the scores on both dice are the same, no changes are made
 - If the scores are not the same, the player with the highest score adds the 'strength modifier' to the strength value and the 'skill modifier' to the skill value for their character
 - The player with the lower score on the dice subtracts these modifiers from the strength and skill values for their character
- If a skill value becomes negative, then it is stored as zero
- If a strength value becomes zero or negative, then the character dies.

The program should:

- Allow the user to input the strength and skill for two characters.
- Display the outcome of the encounter using the process above.