

# Guess a Number Program

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This task should take around 2 hours.

Work through it step by step and answer each question in turn.

Your work needs to be e-mailed to me as a **single** Word (or similar program) document. This is called your "**solution document**".

Your solution document should have any program code copied and pasted into it (check indents are right). I will then copy and paste it into IDLE to check that it works.

My e-mail address is [iford@cliffparkoa.co.uk](mailto:iford@cliffparkoa.co.uk)

The resources for this task are online at

[www.bluesquarething.co.uk/cs/cshome.htm](http://www.bluesquarething.co.uk/cs/cshome.htm)

This includes a framework for the Python code needed to complete some sections of the work as well as this document.

## **Program Specification:**

A program is required to play a "Guess the number" game. An integer between 1 and 20 will be chosen at random by the computer. The player will then need to enter a guess.

After each guess the player will be told if their guess is "higher" or "lower" than the number. They will then be asked to re-enter a guess until they guess the number correctly, at which point they should be told that they guessed the answer right and how many guesses they took.

Maths theory tells us that it should take no more than 5 guesses for any methodical player to guess the number.

## Generating the random number:

The first requirement is to generate a random number. This needs a Python module to be imported first. The following code should start your program to do this:

```
import random

theNumber = random.randint(1, 20)
```

This will generate a random integer between 1 and 20 inclusive.

## Question 1

The code framework required is given below with gaps for you to complete.

```

1  # Program to play "Guess a Number"
2  # Complete the lines of code where indicated
3
4  #First import random module and create a random number
5  import random
6  theNumber = random.randint(1, 20)
7
8  theGuess = input("Enter a number between 1 and 20: ")
9  theGuess = int(theGuess)
10
11 # enter a line of code to set the variable guesses to 1 for question 1b
12
13 while (Condition to complete in question 2a):
14
15     if (Condition to complete in question 3a):
16         print ("Lower")
17     else:
18         # line of code to complete in question 3b
19
20     theGuess = input("Enter a number between 1 and 20: ")
21     theGuess = int(theGuess)
22     # line of code to add in question 3d
23
24 print ("You guessed it in " + str(guesses) + " guesses.")
```

- Give a reason why **line 9** of the program code is needed
- Write a line of code to set a variable `guesses` to 1 in **line 11**.

Copy and paste the line of code into your solution document.

- Explain the purpose of the variable `guesses` in the program

## Question 2

- a) Write a condition for the `while` statement in **line 13** of the code. This condition should check to see if the user needs to make a second guess or not.

Copy and paste the condition into your solution document.

- b) Explain the purpose of the `while` loop in terms of **program flow** in this program.

## Question 3

- a) Write a condition for **line 15** of the program. This condition should check to see if the user needs to guess a lower number.

Copy and paste your condition into your solution document.

- b) Write a suitable line of code for **line 18** of the program.

Copy and paste this line of code into your solution document.

- c) Explain why an `else:` statement is suitable for use in **line 17** of the program.

- d) Write a line of code for **line 22** of the program to increase the number of guesses the user has made by a suitable amount.

Copy and paste your line of code into your solution document.

**Turn over for question 4**

## Question 4

- a) Add comments to your program code to make it possible for another user to understand what your program is doing. Use the comment on **line 4** as an example.
- b) Run your program to check that it works.
- c) Take a screenshot to show your program **in operation** (i.e. in the program window showing the messages appearing on screen). The screenshot should show the program window at the **end** of the program. Make sure that it shows **more than two guesses**.

Copy and paste the screenshot into your solution document.

- d) Copy and paste your program code into your solution document. Make sure that any indentation is retained.

### ***What to do if you have a problem:***

#### **If you don't have Python at home**

Do the prep work at home and then spend 30 minutes completing the code at school.

#### **If you don't have Word at home**

Use another text editor of some kind. Even Notepad will do. You may have to submit the screenshot as a separate file, but that's OK.

#### **If you can't get the program to work.**

Copy and paste the code you have into your solution document and send it in. Include any notes as to what you're having problems with. This will show me why you're having problems and the way in which you're thinking about the program.

#### **If you're having a problem with one part of the program.**

Send me an e-mail. I might be able to help.

#### **If you don't understand any of this.**

Come and talk to me. Urgently.