In your own words, briefly describe the 3 decision structures discussed in Chapter 3 (if-else, while, for). When might you use each type in a program? Provide examples.

If-else decision structures are used for evaluating a condition to see if it’s true or false. An example would be determining if a time should be AM or PM:

if hours < 12:  
 ampm = "AM"  
else:  
 ampm = "PM"

A while loop checks a condition, and while it is true it keeps repeating the code inside the loop (iteration). This could be used for a robotic car:

while brakes = false:  
 # Code to keep driving

A for loop will execute a block of code for elements in a sequence. An example would be taking a list of months and adding the year each month before printing them:

months = ['Jan', 'Feb', 'Mar', 'Apr', 'May', 'Jun', 'Jul', 'Aug', 'Sep', 'Oct', 'Nov', 'Dec']  
for m in range(len(months)):  
 months[m] += " 2018"  
 print(months[m])

Describe how relational operators can be used with lists/tuples. When might you need to do something like this?

Relational operator can be used to compare lists (the reason for which I can’t quite come up with) or to determine if a value is present in a list/tuple. There are many reasons for the latter, and one example would be determining if a name is in a phone book list and then printing the telephone number for that name.

Describe what is meant by Short-Circuit Evaluation. Provide an example

Short-circuit evaluation is when a compound evaluation (cond1 AND cond2) is evaluated by the first part and then the second, instead of as a whole. I really like the example in the text as a way to use short-circuit evaluation to avoid errors in a program (in this case, avoiding division by zero):

(number != 0) and (m == (n / number))

For the division in the second part to be performed, both parts must be TRUE. If number = 0, the first part returns FALSE and the second part is never run.