

Advanced Programming

Key Words

ASCII	American Standard Code for Information Interchange. A 7-bit character set used for representing English keyboard characters.
database	A data store designed in an organised way, making it easier to search for the information you need.
function	A section of code that, when programming, can be called by another part of the program with the purpose of returning a value.
parameter	Specifies any values that must be passed to a subroutine when it is called. Parameters are defined when a subroutine is declared.
scope	Refers to where in the program a variable or constant can be accessed.
procedure	A section of computer code that performs a specific task but does not return a value.
SQL	Structured Query Language, a language used to extract information from a database.
record	A data structure that allows for multiple variables of differing types to be held within it.
variable	A named memory address that holds a value. The value held in a variable can change as the program is running.

Structured Query Language (SQL)

- SQL is a language for storing, manipulating and retrieving data in databases.

SELECT	which fields to be returned. * can be used to indicate all fields.
FROM	which table the fields will be returned from.
WHERE	records meet a condition.
LIKE	can be used with WHERE to search for a pattern. % can be used as a wild card.

- Example:

Table : hotels					
ID	hotel_name	hotel_rating	rooms	bathroom	price
1	Water Lodge	2.3	50	En-suite	42.00
2	Fire Inn	4.2	60	Shared	42.00
3	Earthen House	4.4	251	En-Suite	39.00
4	Windy Inn	3.5	150	Shared & Ensuite	57.00
5	River View	3.8	180	En-Suite	46.00

- The SQL statement:
SELECT hotel_name FROM hotels WHERE rooms > 150
- would return
River View and Earthen House
- The SQL statement:
SELECT * FROM hotels WHERE hotel_name LIKE "%Inn"
- would return
2 Fire Inn 4.2 60 Shared 42.00
4 Windy Inn 3.5 150 Shared & Ensuite 57.00

Random Numbers

- A computer can be used to generate a random number.

```
myVariable = random(1,6)
```

Creates a random integer between 1 and 6 inclusive.

```
myVariable = random(-1.0,10.0)
```

Creates a random real number between -1.0 and 10.0 inclusive.



Records

- Records are a data structure used to store a collection of data.
- They can store information of different data types.
- Field = each item in a record is a field.
- Each field has a name and data type.

record creation	record student string name int age bool registered endrecord
data assignment	student1 = student("bob", 14, True)
data access	print(student1.name) will print "bob"

Quizizz



Extended Reading



Exam Questions



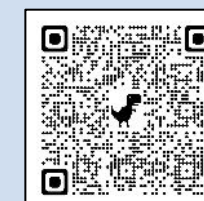
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Advanced Programming

Subprograms

- If tasks are completed more than once, these tasks can be written as functions or procedures to avoid having to type the code in again.
- Subprograms can be called whenever they are needed.
- A function is a subprogram that returns a value.
- A procedure is a subprogram that does not return a value.
- Parameters are variables used to pass values into a function or procedure.
- Structuring code into sub-programs makes the code easier to read and debug.

Defining functions and procedures

function no parameters	function with parameters
<pre>function getPi() i = 22 / 7 return pi endfunction</pre>	<pre>function sum(num1, num2) total = num1 + num2 return total endfunction</pre>
procedure no parameters	procedure with parameters
<pre>procedure greet() print("Welcome") endprocedure</pre>	<pre>procedure greet(name) print("Hello" + name) endprocedure</pre>

Calling functions and procedures

function	procedure
<pre>area = getPi() * r * r</pre>	<pre>greet("sarah")</pre>

Global and Local Variables

- Programming languages require a variable to be identified before a value is assigned to it. This is known as declaring a variable.
- The scope of a variable determines which parts of a program can access and use that variable.
- A global variable is a variable that can be used anywhere in a program. The issue with global variables is that one part of the code may inadvertently modify the value because global variables are hard to track.
- Global variables need to be defined throughout the running of the whole program. This is an inefficient use of memory resources.
- A local variable is a variable that can only be accessed within a certain block of code typically within a function. Local variables are not recognized outside a function unless they are returned. There is no way of modifying or changing the behavior of a local variable outside its scope.
- Local variables are defined only when they are needed and so have less demand on memory. Local variables only exist within the subroutine.

global variable

```
globalVar = "I am global"  
  
def scope():  
    global globalVar  
    localVar = "I am local"  
    print(localVar)  
    globalVar = "Changed"  
    print(globalVar)  
  
scope()
```

local variable

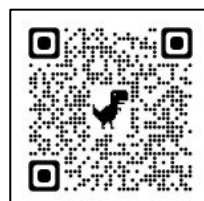
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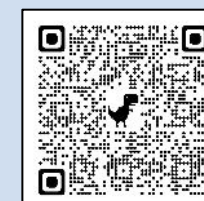
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