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| Instructor |  | Due Date |  |

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| **Part** | **1** | **2** | **3** | **4** | **Total** |
| *Maximum Points* | **25** points | **25** points | **25** points | **25** points | **100**G101010 pointsG |
| ***Your Score*** |  |  |  |  |  |

**Textbook Reading Assignment**

Thoroughly read Chapter(s) on Functions in your **Python** textbook.

**Part 1 Glossary Terms**

Define, in detail, each of these glossary terms from the realm of computer programming logic and design and computer topics, in general. If applicable, use examples to support your definitions. Consult your notes or course textbook(s) as references or the Internet by visiting Web sites such as:

|  |  |  |
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| http://www.askjeeves.com | http://www.webopedia.com | http://www.bing.com |

**(a) def**

|  |
| --- |
| Keyword used to define a function |

**(b) Global Variables**

|  |
| --- |
| Variables that can be accessed within the scope of any function in a .py file |

**(c) Intrinsic Functions**

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| --- |
| A native, or baked-in, function that is a part of a programming language. For example, print() |

**(d) Local Variables**

|  |
| --- |
| Variables that are only accessible within a given function’s scope |

**(e) Parameters**

|  |
| --- |
| The fields in a function definition that indicate the expected arguments a function will receive, for example, “arg1, arg2” in `def some\_func(arg1, arg2)` |

**Part 2 Textbook Exercises - Functions**

For each of the following, enter T if the statement is TRUE otherwise enter F for FALSE.

**TRUE** **(1)** The code block within every function starts with a colon ( : ) and is subsequently indented.

**TRUE** **(2)** Any input parameters or arguments should be placed within ( ) parentheses.

**FALSE** **(3)** All parameters ( arguments ) in the Python language are passed by value and not by reference.

**TRUE** **(4)** A default argument is one that assumes a default value if a value is not provided in the function call for that argument.

**FALSE** **(5)** Variables that are defined inside a function body have a global scope and those defined outside have a local scope.

**Part 3 Textbook Exercises - Functions**

Predefined mathematical methods that are always available include those below.

|  |  |  |
| --- | --- | --- |
| **method name** | **description** |  |
|  |  |  |
| abs( m ) | returns the absolute value of m |  |
| max( m , n ) | returns the larger of m and n |  |
| min( m , n ) | returns the smaller of m and n |  |
| pow( m , n ) | returns m raised to the power n , i.e. m \*\* n |  |
| round( m ) | returns a value which is the integer closest to m |  |

Predefined mathematical methods that are part of the math library include those below.

|  |  |  |
| --- | --- | --- |
| **method name** | **description** |  |
|  |  |  |
| ceil( m ) | rounds m to the smallest integer not less than m |  |
| floor( m ) | rounds m to the largest integer not greater than m |  |
| pow( m , n ) | returns m raised to the power n , i.e. m \*\* n |  |
| sqrt( m ) | returns a value which is the square root of m |  |

Evaluate each of the following, which include math predefined functions.

**(1)** **6.0** abs(6.0)

**(2)** **6.0** abs(-6.0)

**(3)** **11** math.ceil(10.25)

**(4)** **-6** math.ceil(-6.8)

**(5)** **-6** math.floor(-5.1)

**(6)** **7** math.floor(7.9)

**(7)** **25** pow(5 , 2)

**(8)** **32** pow(2, 5)

**(9)** **2** max(1.5 , 2)

**(10)** **0.5** min(3 , 0.5)

**(11)** **1.5** min(2 , 1.5)

**(12)** **3** max(0.5 , 3)

**(13)** **4** math.sqrt(16.0)

**(14)** **1** round(0.6)

**(15)** **2** math.ceil(math.pow(3 , 0.5))

**(16)** **2** math.floor(pow(1.5 , 2))

**(17)** **3** math.ceil(math.floor(3.5))

**(18)** **2.5** min(max(3.0 , 2) , 2.5)

**(19)** **3.0** max(min(2.0 , 3) , 3.0)

**(20)** **2.83** math.sqrt(pow(2.0 , 3))

**(21)** **9** pow(math.sqrt(9) , 2)

**(22)** **3** round(max( 2.1 , 3.1))

**(23)** **8.0** abs(abs(8.0))

**(24)** **1.5** min(abs(1.5) , 2)

**(25)** **1.0** math.ceil(pow(1 , 0.5))

**Part 4 Textbook Exercises - Functions**

Consider the program below. Its purpose is to calculate the population of a colony of bacteria using the formula *P* = *N* *e* ( *k**t* ) in a method named population , where *P* is the population at time *t* , *N* is the initial population at time *t* = 0 , *k* is the growth rate and e is the base number of the natural number system, approximated as 2.718282 . Determine the missing identifiers, symbols or numbers. Write your responses in the spaces provided.

|  |
| --- |
| **import math**  **def population(initial , rate, time) :**  **result = initial \* math.exp(rate \* time)**  **return result**  **def main() :**  **N = 0; k = 0; t = 0; endResult = 0**  **print("Find bacteria population at specified time\n")**    **print("Enter initial population -> ")**  **N = float(input())**  **print("Enter growth rate -> ")**  **k = float(input())**  **print("Enter number of time periods -> ")**  **t = float(input())**    **endResult =population(N, k , t)**    **print("Population after ", t ," time periods = ")**  **print(round(endResult, 2))**    **main()** |