**1. Expressions**

For each expression in the left-hand column, indicate its value in the right-hand column.
Be sure to list a constant of appropriate type (e.g., 7.0 rather than 7 for a float, strs in quotes).

Expression Value

5 \* 6 - (4 + 3) \* 2 - 2 \* 3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

208 // 20 // 4 + 12 / 10.0 + 0.4 \* 2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8-2 \* 2 + (8 - 2) + 8 / 1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4 \* 5 % 6 + 297 % 10 + 4 % 8 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13 // 2 \* 3.0 + 5.5 \* 3 // 2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

not 3 > 4 and 16 == 16 and 12 >= 1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4 >= 3 or 2 <= 1 and not 4 != 4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10 // 3 > 12 // 5 or 12 == 16 - 5 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. **Parameter Mystery**.

At the bottom of the page, write the output produced by the following program.

def main():

 rick = "pickle"

 morty = "jeez"

 jerry = "unemployed"

 sauce = "szechuan"

 lyrics(rick, morty, "mr.")

 lyrics(jerry, "dimension", "megatree")

 lyrics("megaseeds", sauce, rick)

 lyrics("pickle", "Jessica", morty)

 lyrics("here", "schwifty", "you")

def lyrics(here, schwifty, you):

 print(you, "gotta get", schwifty, "in", here)

main()

**3. If/Else Simulation**

For each call of the function below, write the value that is printed:

 def mystery(a, b):

 if a < b:

 a += 1

 if a < b:

 a += 1

 else:

 b += 1

 if a >= b:

 b = b - 5

 print(a, b)

Function Call Value Returned

mystery(1, 8) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

mystery(3, 5) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

mystery(4, 5) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

mystery(8, 6) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

mystery(10, 12) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**4. Programming**

Write a function called found\_odd\_even that takes an integer n as a parameter, and prompts a user n times for an integer value, printing out whether the input number was odd or even.

|  |  |  |
| --- | --- | --- |
| **Function call** | found\_odd\_even(2) | found\_odd\_even(4) |
|  | Number? 2EvenNumber? 5Odd | Number? 27OddNumber? 35OddNumber? 1OddNumber? 3Odd |
| **return value** | True | False |

You may assume that all integers passed to your function are greater than or equal to 0.

**5. Programming**

Write a function print\_rectangles that takes two integers as parameters, a width and a height. Your function should prompt the user for a scale factor (an integer). The function prints two rectangles consisting of ASCII stars ("\*"). The first rectangle is of size width times height. The second rectangle is shifted to the right by the width of the first rectangle and is width \* scale wide and height \* scale high.

|  |  |  |
| --- | --- | --- |
| **Function call** | print\_rectangles(5, 3) | print\_rectangles(4, 2) |
|  | Scale = **2**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* \*\*\*\*\*\*\*\*\*\* \*\*\*\*\*\*\*\*\*\* \*\*\*\*\*\*\*\*\*\* \*\*\*\*\*\*\*\*\*\* \*\*\*\*\*\*\*\*\*\* \*\*\*\*\*\*\*\*\*\* | Scale = **3**\*\*\*\*\*\*\*\* \*\*\*\*\*\*\*\*\*\*\*\* \*\*\*\*\*\*\*\*\*\*\*\* \*\*\*\*\*\*\*\*\*\*\*\* \*\*\*\*\*\*\*\*\*\*\*\* \*\*\*\*\*\*\*\*\*\*\*\* \*\*\*\*\*\*\*\*\*\*\*\* |

**6. Programming**

Write a function called rand\_nums that takes a number n as a parameter. It should generate n random numbers output as below and output their max and min. The random numbers should be between 1 and 100. Below a couple calls are shown with one possible outcome

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Call** | rand\_nums(0) | rand\_nums(1) | rand\_nums(2) | rand\_nums(6) |
| **output** |   | n = 45min = 45max = 45 | n = 2n = 50min = 2max = 50 | n = 40n = 39n = 5n = 78n = 13n = 1min = 1max = 78 |

**Midterm Solutions**

1. Expressions

10

4.0

18.0

13

26.0

True

True

True

1. Parameter Mystery

mr. gotta get jeez in pickle

megatree gotta get dimension in unemployed

pickle gotta get szechuan in megaseeds

jeez gotta get Jessica in pickle

you gotta get schwifty in here

1. If/Else Mystery

3 8

5 0

5 6

8 2

12 7

1. Programming

 def found\_odd\_even(n):

 value = False

 for i in range(n):

 x = int(input("Number? "))

 if x % 2 == 0:

 print("Even")

 value = True

 else:

 print("Odd")

 return value

1. Programming (two solutions shown)

def print\_rectangles(width, height):

 scale = int(input("Scale = "))

 for line in range(1, height + 1):

 for i in range(1, width + 1):

 print("\*", end="")

 print()

 for line in range(1, height\*scale + 1):

 for i in range(1, width + 1):

 print(" ", end="")

 for i in range(1,width\*scale + 1):

 print("\*", end="")

 print()

def print\_rectangles(width, height):

 scale = int(input("Scale = "))

 for line in range(1, height + 1):

 print("\*" \* width, end="")

 for line in range(1, height\*scale + 1):

 print(" " \* width, end="")

 print("\*" \* (width \* scale), end="")

1. Programming

def rand\_nums(n):

 max1 = 0

 min1 = 101

 for i in range(n):

 x = randint(1, 100)

 print("n =", x)

 if x > max1:

 max1 = x

 if x < min1:

 min1 = x

 print("min =", min1)

 print("max =", max1)