You can find multiple choice review questions in D2L under: `Assessments->Quizzes`

For all questions, unless otherwise specified assume that there are no syntax errors in any programs or program fragments.

Short answer 1 (code writing):

Modify the following program so it will take the number entered by the user and calculate the factorial of that integer using a loop and branches. You should not use `math.factorial(n)` and will be awarded no marks on an exam if you use this library rather than writing the code yourself.

```
F(0) = 0! = 1   (By Definition)
F(1) = 1! = 1
F(2) = 2! = 2 x 1 = 2
F(3) = 3! = 3 x 2 x 1 = 6
…
F(n) = n! = (n)x(n-1)x(n-2)x….3x2x1
```

A suitable error message should be displayed if a negative integer has been entered. Otherwise the program should calculate the factorial (don't worry about maximum values allowable).
JT's hint: Before looking at the answer make a real attempt at providing an answer. If you are drawing a blank then it indicates that you need to study the material from lecture as well as looking at the in class notes that you should be taking as you are following along in class. You will get far more out of the process if you try it out as if you were writing an actual exam question rather than just directly looking at the answer.

Make sure you try this question before looking at the solution.
(Solution is on the next page)

```
fact = int(input("Factorial: "))
print("%d!=" %fact, end ="")
# Write your answer here
# fact < 0, error
if (fact < 0):
    print("Factorial cannot be calculated for a negative number")
# fact = 0 or 1, result = 1
elif ((fact == 0) or (fact == 1)):
    result = 1
else:
    result = fact
    # fact(n) = n * (n-1) * (n-2)... * 2 * 1
    while (fact >= 2):
        fact = fact - 1
        result = result * fact
print(result)
```

Short answer 2 (code writing):

- This program stores a person's physical strength as an integer value from 3 - 18.
- The program starts by randomly initializing the strength to a value within this range.
- Next it will allow the user to adjust the strength up or down by an integer value (negative value adjusts down, positive adjust up)
- After the user enters each adjustment:
    - If the adjustment will decrease strength then the message "Decrease" appears.
    - If the adjustment will increase strength then the message "Increase" appears.
    - The adjustment process either ends when the adjusted strength is outside the above range (the adjustment will be allowed but no more adjustments will be allowed) or when 10 adjustments to strength have been made.
- After all adjustments are finished then the program will:
    - Indicate that adjustments are completed
    - When strength is at or below the strength penalty the message "Ability to complete tasks reduced" appears.
    - When strength is at or above the strength bonus the message "Bonus due to strength" appears.
    - Otherwise the message "No adjustment" appears
- Modify the following program by inserting the necessary instructions in the specified location.

```
import random
MAX_ADJUSTMENTS = 10
MIN_STRENGTH = 3
MAX_STRENGTH = 18
STRENGTH_PENALTY = 7
STRENGTH_BONUS = 15
```

Make sure you try this question before looking at the solution.
(Solution is on the next page)

```
doneAdjustments = False
strength = random.randrange(2,18)+1 #Values 3 - 18
count = 0

while(doneAdjustments == False):
    print("Current strength %d" %(strength))
    adjustment = int(input("Adjustment to strength (whole number): "))
    if (adjustment < 0):
        print("Decrease")
    elif (adjustment > 0):
        print("Increase")
    else:
        print("No change")
    count = count + 1
    if ((count >= MAX_ADJUSTMENTS) or \
        (strength < MIN_STRENGTH) or \
        (strength > MAX_STRENGTH)):
        doneAdjustments = True
    strength = strength + adjustment

print("\nAdjustments completed")
print("Final strength %d" %(strength))
if (strength <= STRENGTH_PENALTY):
    print("Ability to complete tasks reduced")
elif (strength >= STRENGTH_BONUS):
    print("Bonus due to strength")
else:
    print("No adjustment")
```