FIZ 425E PYTHON

QUIZ 3

1.

The exponential function can be approximated by the following expansion:

$$e^x \approx \sum_{k=0}^{N} \frac{x^k}{k!}$$

Write a code to do:

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Main program:
i. Ask the user to enter the number x and *N*.
ii. Start with *p = 1* (this will be your *N* in the original equation), send x and *p* to the function "**expoexpa**"
iii. Write *p*, the approximate value for e^x and the difference between this approximate value and the exact value to the screen all in the same line for a *p* value.
iv. Do the steps **ii** and **iii** for all values from *p = 1* to *p = N*. Do not forget to use a new line for each *p*.
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Function "**expoexpa**"
- Inputs: x and *p*
- Calculate

$$e^x \approx \sum_{k=0}^{p} \frac{x^k}{k!}$$

(- Find "*k!*" using the function "**myfactorial**")
- Outputs:
i. The approximate value of e^x
ii. The difference between this value and the exact value which can be calculated by the command *exp(x)*.
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Function "**myfactorial**"
- Input: An integer number *k*
- Output: The factorial of *k*
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2.

Turkey is located between 36-42° in latitude and between 26-45° in longitude. The annual probability of an astroid (with a radius of 50 meters) impact for the whole earth is 0.2% and the probability is equal for the all points on the earth. Latitude values change between [-90,90] and longitude values change between [-180,180] (all real values, not integers). Start the simulation from the year 2014 and stop when an astroid impact occurs in Turkey. Print the final year and the latitude and longitude values on the screen.