**EN 001203 Computer Programming**

**L005: Character and String Exercise**

**Faculty of Engineering, Khon Kaen University**

Submission: https://autolab.en.kku.ac.th

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\* Submit an answer to a question with a file with txt extension. E.g., an answer for Q1 should be submitted in a text file “Q1.txt”

\* Submit a program to a (programming) problem with a file with cpp extension. E.g., a program for P2 should be named “P2.cpp”

\* All answers and programs must be packaged together in a tar file.

\* Each question or problem is worth 60 points. The 240 points are counted as full score. Students are encouraged to work on as many problems as they can, but seeing 240 points could make any programming instructor super content already.

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“The best way to cheer yourself up is to try to cheer somebody else up.”

Mark Twain

**P1.** Simple character. Write a program .....

[Hint: ....]

Have the program interact exactly like what shown in the examples. Starting balance, annual return factor, and target are inputted by a user.

Output example: when inputting starting balance, annual return, and target as 10000, 1.1, and 20000

|  |
| --- |
| balance: **10000**  factor: **1.1**  target: **20000**  Year 6: balance = 17715.6  Year 8: balance = 21435.9 |

**P2.** Integer to note. Write a program ....

[Hint: a for statement may be more suitable when a number of iterations is fixed.]

Have the program interact exactly like what shown in the examples. Starting balance, annual return factor, and a number of years are inputted by a user.

Output example: when inputting starting balance, annual return, and a number of years as 100000, 1.02, and 4

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| --- |
| balance: **100000**  factor: **1.02**  years: **4**  Year 1: balance = 102000  Year 2: balance = 104040  Year 3: balance = 106121  Year 4: balance = 108243 |

**P3.** Simple string. .....

Have the program interact exactly like what shown in the examples. A number n is inputted by a user.

Output example: when inputting n as 4

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| n: **4**  n! = 24 |

**P4.** Capitalize string. ....

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[Hint: function pow of library cmath may be handy.]

Have the program interact exactly like what shown in the examples.

Output example: when inputting x and M as 1 and 10

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| x: **1**  M: **10**  s = 2.71828 |

**P5.** Triad Chord.

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Have the program interact exactly like what shown in the examples. Both ratio and sensitivity are inputted by a user.

Output example: when inputting ratio (carbon-14 to 1012 carbon-12) and sensitivity (carbon-14 to 1012 carbon-12) as 1 and 0.001

|  |
| --- |
| ratio: **1**  sensitivity: **0.001**  Year 0: ratio = 1  Year 5730: ratio = 0.5  Year 11460: ratio = 0.25  Year 17190: ratio = 0.125  Year 22920: ratio = 0.0625  Year 28650: ratio = 0.03125  Year 34380: ratio = 0.015625  Year 40110: ratio = 0.0078125  Year 45840: ratio = 0.00390625  Year 51570: ratio = 0.00195312 |

Output example: when inputting ratio (carbon-14 to 1012 carbon-12) and sensitivity (carbon-14 to 1012 carbon-12) as 1.2 and 0.004

|  |
| --- |
| ratio: **1.2**  sensitivity: **0.004**  Year 0: ratio = 1.2 |

**P6.** Count k-mer.

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“I think a hero is any person really intent on making this a better place for all people.”

Maya Angelou

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