For the following questions reply with a complete code example to be provided/submitted. There is no single correct response to any of the below questions. Please answer to the best of your abilities. Your code will be reviewed by Cadence prior to any interview.

1. Working with Strings

Consider the following sentences:

my_string1 = “The Quick Blue Bird1234 Flew Over the Fast River”

my_string2 = “The Quick Blue Bird76521212 Flew Over the Fast River”

Create a function that uses a regular expression pattern to print out this sentence: “The Quick Brown Cow Jumped Over the Lazy Moon”.

Call the function using:

convert_string(my_string1)

convert_string(my_string2)

2. File I/O (and string manipulation)

Given a text file with exactly the lines found in the next page.

Create a script that will:

- Read in a file that the user will supply on the command line
- Iterate through all lines in the file and do the following:
- For all lines that start with UVM_INFO, UVM_WARNING or UVM_ERROR (this is the message type and whose format of the message is
    - <message type> <full path to file>(<line number>) @ <time><timeunit>: <hierarchical location> <message>
    - Write the following fields to a comma separate value (CSV) file (with a header) as follows:
        - message type, hierarchical location, filename, line number, time, message
    - **NOTES**:
        - Ensure that the filename only contains the file name (e.g. uart_monitor.sv) and not the path to the file
        - Ensure that the brackets are removed from the line number
        - Ensure that the time is only the decimal value (remove the time units)
        - Ensure that the message portion is a single string item (not a list)
- Please add input parameter checking in place to ensure that the user supplies the correct number of input arguments (write an error to the screen if the user does not provide both arguments)

Input file for problem 2.

```
                +UVM_VERBOSITY=MEDIUM
      +UVM_TESTNAME=uart_bad_parity_test
      +UVM_VERBOSITY=MEDIUM
    with `UVM_NO_DEPRECATED undefined.
    with `UVM_OBJECT_MUST_HAVE_CONSTRUCTOR undefined.
                 (Specify +UVM_NO_RELNOTES to turn off this notice)
UVM_INFO @ 0ns: reporter [RNTST] Running test uart_bad_parity_test...
UVM_INFO ../..//pkg_lib/soc_verification_lib/sv_cb_ex_lib/uart_ctrl/tb/sv/uart_ctrl_tb.sv(94) @ 0ns:
uvm_test_top.uart_ctrl_tb0 [NOCONFIG] No uart_ctrl_config, creating...
UVM_INFO ../..//pkg_lib/soc_verification_lib/sv_cb_ex_lib/uart_ctrl/tb/sv/uart_ctrl_tb.sv(98) @ 0ns:
uvm_test_top.uart_ctrl_tb0 [uart_ctrl_tb] Printing cfg:
           is_active uvm_active_passive_enum 1 UVM_PASSIVE
          is_active uvm_active_passive_enum 1 UVM_ACTIVE
      is_tx_active uvm_active_passive_enum 1 UVM_ACTIVE
   is_rx_active uvm_active_passive_enum 1 UVM_PASSIVE
xcelium> uvm_set "*" "recording_detail" UVM_FULL
UVM_INFO @ 0ns: uvm_test_top.uart_ctrl_tb0.apb0 [CFGNRD] ::: The following resources have at least one
write and no reads :::
UVM_INFO ../..//pkg_lib/soc_verification_lib/sv_cb_ex_lib/uart_ctrl/tb/sv/uart_ctrl_tb.sv(174) @ 0ns:
uvm_test_top.uart_ctrl_tb0 [uart_ctrl_tb] UART_Controller Testbench Topology:
               recording_detail uvm_verbosity 32 UVM_FULL
                 recording_detail uvm_verbosity 32 UVM_FULL
                endian ... UVM_LITTLE_ENDIAN
UVM_INFO ../..//pkg_lib/soc_verification_lib/sv_cb_ex_lib/interface_uvc_lib/uart/sv/uart_monitor.sv(127) @
0ns: uvm_test_top.uart_ctrl_tb0.uart0.Tx.monitor [uart_tx_monitor] Start Running
UVM_INFO ../..//pkg_lib/soc_verification_lib/sv_cb_ex_lib/uart_ctrl/sv/sequence_lib/uart_ctrl_virtual_seq_lib.
sv(292) @ 0ns: uvm_test_top.uart_ctrl_tb0.virtual_sequencer@@u2a_bad_parity_vseq
[u2a_bad_parity_vseq] UART Controller Virtual Sequencer Executing
UVM_INFO ../..//pkg_lib/soc_verification_lib/sv_cb_ex_lib/interface_uvc_lib/uart/sv/uart_tx_driver.sv(97) @
0ns: uvm_test_top.uart_ctrl_tb0.uart0.Tx.driver [uart_tx_driver] Reset Asserted

UVM_WARNING ../..//pkg_lib/soc_verification_lib/sv_cb_ex_lib/interface_uvc_lib/apb/sv/apb_collector.sv(13
9) @ 200ns: uvm_test_top.uart_ctrl_tb0.apb0.bus_collector [apb_collector] Transfer collected :
VM_ERROR ../..//pkg_lib/soc_verification_lib/sv_cb_ex_lib/interface_uvc_lib/apb/sv/apb_collector.sv(139) @
27075ns: uvm_test_top.uart_ctrl_tb0.apb0.bus_collector [apb_collector] Invalid Transfer Collected :
UVM_INFO ../..//pkg_lib/soc_verification_lib/sv_cb_ex_lib/uart_ctrl/sv/sequence_lib/uart_ctrl_seq_lib.sv(297)
@ 27080ns: uvm_test_top.uart_ctrl_tb0.apb0.master.sequencer@@u2a_bad_parity_vseq.rd_rx_fifo
[read_rx_fifo_then_error_reg_seq] RX FIFO fill level is currently: 0
```

3. Dictionaries

Create a nested dictionary called “classroom”.

Within classroom, create dictionaries for 4 people storing their “name”, “age” and what “school” they attended.

Create a for loop that prints all people in the classroom with the above information.

4. Object Oriented Programming (and working with lists)

How would you model the above classroom using OOP for each student?

Create a classroom model, that includes a class room number, a teacher and list of students.

Please include classroom methods to:

1. Add a student to the class
2. Delete a student from the class by name
3. Return a list of students whose age matches a user-specified parameter
4. Print the class list (room number, name, age of each student and the teachers name)

a. Formatting is left up to you

5.Recursion

Create a recursive function that takes in at least 2 integer arguments, ”a” and “m”.

The recursive function will iterate over the range of “a” through “m” adding up all the values.

If a=2 and m=5 the function will produce: the result 14 (e.g. 2+3+4+5)