Hash functions

Submission deadline:	**2023-04-09 23:59:59**	16655.332 sec
Evaluation:	**5.0000**	
Max. assessment:	**5.0000** (Without bonus points)	
Submissions:	21 / 20 Free retries + 10 Penalized retries (-10 % penalty each retry)	
Advices:	2 / 2 Advices for free + 2 Advices with a penalty (-10 % penalty each advice)	

Your task is to implement a function (or set of functions, not the whole program) that finds **any** message whose hash (**SHA-512**) starts from the left on a sequence of zero bits.

The bit order is big-endian: Byte 0 from MSB to LSB, Byte 1 from MSB to LSB, …, last byte from MSB to LSB.

For example, byte `0010 0111` (`0x27`) starts with a sequence of two zero bits.

The function is requested in two variants:

- basic solution (function `findHash`). Implementation of this function is mandatory.
- An enhanced solution (function `findHashEx`). Implementing this function is not compulsory, but the task will fail to compile without the supplied "dummy" implementation. Implement the function if you decide to pursue the bonus.

The parameters of the functions you implement are:

`int findHash (int bits, char ** message, char ** hash)`

- `bits` - the desired number of zero bits in the message hash.
- `message` - output parameter. This parameter contains the data for which the corresponding hash was found. The result is stored as your dynamically allocated hexadecimal C string (terminated by `\0`).
- `hash` - output parameter. This is the hash of the `message` message from the previous parameter; again it is a dynamically allocated hexadecimal C string.
- The function's return value is `1` on success, `0` on failure or incorrect parameters. These are typically the required number of null bits, which makes no sense.

`int findHashEx (int bits, char ** message, char ** hash, const char * hashFunction)`

- An extension to the `findHash` function. All parameters and return values remain the same as in the basic variant.
- `hashFunction` - a new parameter that specifies which hash function should be used to find a sequence of null bits. The specified hash function name is compatible with the `EVP_get_digestbyname` function.

You don't have to worry about releasing dynamically allocated memory (`message` and `hash`, but only if the function succeeds). The test environment will ensure their correct release. However, all other memory work is up to you.

Submit a source file that contains the implementation of the requested `findHash` or `findHashEx` function. You can also add your other support functions that are called from `findHash` (or `findHashEx`) to the source file. The function will be called from the test environment, so strictly following the specified function interface is essential.

Use the code from the attached archive below as a basis for implementation. The sample contains a test function `main`; the values given are used in the basic test. Note that the header file insertion and the `main` function are wrapped in a conditional compilation block (`#ifdef/#endif`). Please leave the conditional translation blocks in the commit source file as well. Conditional translation will simplify your work. You can run and test the program when compiled on your machine. When compiling on Progtest, the `main` function and the header file insertion "disappear", i.e., it will not interfere with the header files and the `main` function of the test environment.

The sample also contains the `checkHash` function, which you will (quite probably) have to implement for your local testing. The function is wrapped in a conditional compilation block (=not tested). Still, it is helpful to implement it to verify the correctness of your solution.

Notes:

- ATTENTION! A submitted assignment on Progtest does not guarantee a completed assignment! For more information, please get in touch with your tutor.
- You can use both C and C++ language resources in your implementation. From the STL library, only `std::vector` and `std::string` are available for this task.
- Do not add additional header files. The current list is more than sufficient. If you do decide to add other header files, inserting them will result in a compilation error.

Sample data:		**Download**

Submit:	Выберите файл Файл не выбран	**Submit**

✅ **Reference**

- **Evaluator: computer**

- Program compiled
- Test 'Zakladni test podle ukazky': success
  - result: 100.00 %, required: 100.00 %
  - Total run time: 0.001 s (limit: 15.000 s)
  - Mandatory test success, evaluation: 100.00 %
- Test 'Test osetreni nespravnych vstupu': success
  - result: 100.00 %, required: 50.00 %
  - Total run time: 0.000 s (limit: 14.999 s)
  - Mandatory test success, evaluation: 100.00 %
- Test 'Test velkymi daty': success
  - result: 100.00 %, required: 50.00 %
  - Total run time: 2.379 s (limit: 14.999 s)
  - Mandatory test success, evaluation: 100.00 %
- Test 'Test nahodnymi daty + mem debugger': success
  - result: 100.00 %, required: 50.00 %
  - Total run time: 0.047 s (limit: 2.000 s)
  - Mandatory test success, evaluation: 100.00 %
- Test 'Bonus: Test osetreni nespravnych vstupu (vice hashovacich funkci)': success
  - result: 100.00 %, required: 100.00 %
  - Total run time: 0.001 s (limit: 1.000 s)
  - Optional test success, evaluation: 100.00 %
- Test 'Bonus: Test vice hashovacimi funkcemi': success
  - result: 100.00 %, required: 100.00 %
  - Total run time: 0.002 s (limit: 1.000 s)
  - Bonus test - success, evaluation: 110.00 %
- Overall ratio: 110.00 % (= 1.00 * 1.00 * 1.00 * 1.00 * 1.00 * 1.10)
- Total percent: 110.00 %
- Total points: 1.10 * 5.00 = 5.50

SW metrics:

	Total	Average	Maximum	Function name
Functions:	7	--	--	--
Lines of code:	72	10.29 ± 14.03	39	findHashEx
Cyclomatic complexity:	33	4.71 ± 6.09	17	findHashEx

21	2023-04-09 15:39:08	**Download**
Submission status:	Evaluated	
Evaluation:	4.5000	

- **Evaluator: computer**
  - Program compiled
  - Test 'Basic test with example input data': success
    - result: 100.00 %, required: 100.00 %
    - Total run time: 0.001 s (limit: 15.000 s)
    - Mandatory test success, evaluation: 100.00 %
  - Test 'Invalid input test': success
    - result: 100.00 %, required: 50.00 %
    - Total run time: 0.000 s (limit: 14.999 s)
    - Mandatory test success, evaluation: 100.00 %
  - Test 'Big input test': success
    - result: 100.00 %, required: 50.00 %
    - Total run time: 2.493 s (limit: 14.999 s)
    - Mandatory test success, evaluation: 100.00 %
  - Test 'Random test + mem debugger': success
    - result: 100.00 %, required: 50.00 %
    - Total run time: 0.024 s (limit: 2.000 s)
    - Mandatory test success, evaluation: 100.00 %
  - Test 'Bonus: Invalid input test (more hash functions)': success
    - result: 100.00 %, required: 100.00 %
    - Total run time: 0.000 s (limit: 1.000 s)
    - Optional test success, evaluation: 100.00 %
  - Test 'Bonus: More hash function test': failed
    - result: 28.57 %, required: 100.00 %
    - Total run time: 0.002 s (limit: 1.000 s)
    - Bonus test - failed, evaluation: No bonus awarded
    - Failed (invalid output) **[Unlock advice (55 B)]**
    - Failed (invalid output) **[Unlock advice (55 B)]**
    - Failed (invalid output) **[Unlock advice (55 B)]**
    - Failed (invalid output) **[Unlock advice (55 B)]**
    - Failed (invalid output) **[Unlock advice (61 B)]**
    - Failed (invalid output) **[Unlock advice (58 B)]**
    - Failed (invalid output) **[Unlock advice (61 B)]**
    - Failed (invalid output) **[Unlock advice (61 B)]**
  - Overall ratio: 100.00 % (= 1.00 * 1.00 * 1.00 * 1.00 * 1.00)

- Advices used: 2
- Penalty due to advices: None (2 <= 2 limit)
- Retries penalty: 10.00 % (= (21 - 20) * 10 %)
- Total percent: 90.00 % (= 1.00 * 0.90)
- Total points: 0.90 * 5.00 = 4.50

SW metrics:		Total	Average	Maximum	Function name
	Functions:	**6**	--	--	--
	Lines of code:	**117**	**19.50 ± 11.81**	**35**	findHashEx
	Cyclomatic complexity:	**28**	**4.67 ± 2.36**	**7**	findHashEx

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20	**2023-04-09 15:37:30**	**Download**

Submission status: Evaluated
Evaluation: 0.0000

- **Evaluator: computer**
  - Program compiled
  - Test 'Basic test with example input data': success
    - result: 100.00 %, required: 100.00 %
    - Total run time: 0.001 s (limit: 15.000 s)
    - Mandatory test success, evaluation: 100.00 %
  - Test 'Invalid input test': success
    - result: 100.00 %, required: 50.00 %
    - Total run time: 0.000 s (limit: 14.999 s)
    - Mandatory test success, evaluation: 100.00 %
  - Test 'Big input test': Abnormal program termination (Time limit exceeded)
    - Cumulative test time exceeded, killed after:: 15.002 s (limit: 14.999 s)
    - Mandatory test failed, evaluation: 0.00 %
  - Overall ratio: 0.00 % (= 1.00 * 1.00 * 0.00)
- Advices used: 2
- Penalty due to advices: None (2 <= 2 limit)
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00

SW metrics:		Total	Average	Maximum	Function name
	Functions:	**6**	--	--	--
	Lines of code:	**117**	**19.50 ± 11.81**	**35**	findHashEx
	Cyclomatic complexity:	**28**	**4.67 ± 2.36**	**7**	findHashEx

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19	**2023-04-09 15:22:29**	**Download**

Submission status: Evaluated
Evaluation: 5.0000

- **Evaluator: computer**
  - Program compiled
  - Test 'Basic test with example input data': success
    - result: 100.00 %, required: 100.00 %
    - Total run time: 0.001 s (limit: 15.000 s)
    - Mandatory test success, evaluation: 100.00 %
  - Test 'Invalid input test': success
    - result: 100.00 %, required: 50.00 %
    - Total run time: 0.000 s (limit: 14.999 s)
    - Mandatory test success, evaluation: 100.00 %
  - Test 'Big input test': success
    - result: 100.00 %, required: 50.00 %
    - Total run time: 5.340 s (limit: 14.999 s)
    - Mandatory test success, evaluation: 100.00 %
  - Test 'Random test + mem debugger': success
    - result: 100.00 %, required: 50.00 %
    - Total run time: 0.049 s (limit: 2.000 s)
    - Mandatory test success, evaluation: 100.00 %
  - Test 'Bonus: Invalid input test (more hash functions)': success
    - result: 100.00 %, required: 100.00 %
    - Total run time: 0.000 s (limit: 1.000 s)
    - Optional test success, evaluation: 100.00 %
  - Test 'Bonus: More hash function test': failed
    - result: 28.57 %, required: 100.00 %
    - Total run time: 0.002 s (limit: 1.000 s)
    - Bonus test - failed, evaluation: No bonus awarded
    - Failed (invalid output) **[Unlock advice (55 B)]**
    - Failed (invalid output) **[Unlock advice (55 B)]**
    - Failed (invalid output) **[Unlock advice (55 B)]**

- Failed (invalid output) **[Unlock advice (55 B)]**
- Failed (invalid output) **[Unlock advice (61 B)]**
- Failed (invalid output) **[Unlock advice (58 B)]**
- Failed (invalid output) **[Unlock advice (61 B)]**
- Failed (invalid output) **[Unlock advice (61 B)]**
    - Overall ratio: 100.00 % (= 1.00 * 1.00 * 1.00 * 1.00 * 1.00)
- Advices used: 2
- Penalty due to advices: None (2 <= 2 limit)
- Total percent: 100.00 %
- Total points: 1.00 * 5.00 = 5.00

SW metrics:		Total	Average	Maximum	Function name
	Functions:	**6**	--	--	--
	Lines of code:	**117**	**19.50 ± 11.81**	**35**	findHashEx
	Cyclomatic complexity:	**28**	**4.67 ± 2.36**	**7**	findHashEx

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18	**2023-04-06 18:50:17**	**Download**
Submission status:	Evaluated	
Evaluation:	0.0000	

- **Evaluator: computer**
    - Program compiled
    - Test 'Basic test with example input data': success
        - result: 100.00 %, required: 100.00 %
        - Total run time: 0.001 s (limit: 15.000 s)
        - Mandatory test success, evaluation: 100.00 %
    - Test 'Invalid input test': success
        - result: 100.00 %, required: 50.00 %
        - Total run time: 0.000 s (limit: 14.999 s)
        - Mandatory test success, evaluation: 100.00 %
    - Test 'Big input test': Abnormal program termination (Time limit exceeded)
        - Cumulative test time exceeded, killed after:: 15.004 s (limit: 14.999 s)
        - Mandatory test failed, evaluation: 0.00 %
    - Overall ratio: 0.00 % (= 1.00 * 1.00 * 0.00)
- Advices used: 2
- Penalty due to advices: None (2 <= 2 limit)
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00

SW metrics:		Total	Average	Maximum	Function name
	Functions:	**6**	--	--	--
	Lines of code:	**111**	**18.50 ± 10.56**	**32**	findHashEx
	Cyclomatic complexity:	**24**	**4.00 ± 2.00**	**7**	main

17	**2023-04-06 15:08:54**	**Download**
Submission status:	Evaluated	
Evaluation:	0.0000	

- **Evaluator: computer**
    - Compile in 'pedantic' mode failed (10 % penalty). **[Unlock advice (336 B)]**
    - Test 'Basic test with example input data': failed
        - result: 80.00 %, required: 100.00 %
        - Total run time: 0.001 s (limit: 15.000 s)
        - Mandatory test failed, evaluation: 0.00 %
        - Failed (invalid output) **[Unlock advice (56 B)]**
    - Overall ratio: 0.00 %
- Advices used: 2
- Penalty due to advices: None (2 <= 2 limit)
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00

SW metrics:		Total	Average	Maximum	Function name
	Functions:	**6**	--	--	--
	Lines of code:	**110**	**18.33 ± 10.39**	**32**	findHashEx
	Cyclomatic complexity:	**24**	**4.00 ± 2.00**	**7**	main

16	**2023-04-05 17:33:33**	**Download**
Submission status:	Evaluated	

Evaluation: 0.0000

- **Evaluator: computer**
    - Program compiled
    - Test 'Basic test with example input data': failed
        - result: 80.00 %, required: 100.00 %
        - Total run time: 0.001 s (limit: 15.000 s)
        - Mandatory test failed, evaluation: 0.00 %
        - Failed (invalid output) **[Unlock advice (56 B)]**
    - Overall ratio: 0.00 %
- Advices used: 2
- Penalty due to advices: None (2 <= 2 limit)
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00

SW metrics:		Total	Average	Maximum	Function name
	Functions:	**6**	--	--	--
	Lines of code:	**117**	**19.50 ± 9.98**	**32**	findHashEx
	Cyclomatic complexity:	**28**	**4.67 ± 2.49**	**9**	main

15	2023-04-05 17:29:36	**Download**
Submission status:	Evaluated	
Evaluation:	0.0000	

- **Evaluator: computer**
    - Program compiled
    - Test 'Basic test with example input data': failed
        - result: 80.00 %, required: 100.00 %
        - Total run time: 0.001 s (limit: 15.000 s)
        - Mandatory test failed, evaluation: 0.00 %
        - Failed (invalid output) **[Unlock advice (56 B)]**
    - Overall ratio: 0.00 %
- Advices used: 2
- Penalty due to advices: None (2 <= 2 limit)
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00

SW metrics:		Total	Average	Maximum	Function name
	Functions:	**6**	--	--	--
	Lines of code:	**117**	**19.50 ± 9.98**	**32**	findHashEx
	Cyclomatic complexity:	**26**	**4.33 ± 2.56**	**9**	main

14	2023-04-05 16:59:04	**Download**
Submission status:	Evaluated	
Evaluation:	0.0000	

- **Evaluator: computer**
    - Program compiled
    - Test 'Basic test with example input data': Abnormal program termination (Segmentation fault/Bus error/Memory limit exceeded/Stack limit exceeded)
        - Total run time: 0.010 s (limit: 15.000 s)
        - Mandatory test failed, evaluation: 0.00 %
    - Overall ratio: 0.00 %
- Advices used: 2
- Penalty due to advices: None (2 <= 2 limit)
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00

SW metrics:		Total	Average	Maximum	Function name
	Functions:	**6**	--	--	--
	Lines of code:	**113**	**18.83 ± 9.99**	**32**	findHashEx
	Cyclomatic complexity:	**24**	**4.00 ± 2.00**	**7**	main

13	2023-04-05 16:24:29	**Download**
Submission status:	Evaluated	
Evaluation:	0.0000	

- **Evaluator: computer**

- Program compiled
  - Test 'Basic test with example input data': Abnormal program termination (Segmentation fault/Bus error/Memory limit exceeded/Stack limit exceeded)
    - Total run time: 0.012 s (limit: 15.000 s)
    - Mandatory test failed, evaluation: 0.00 %
  - Overall ratio: 0.00 %
- Advices used: 2
- Penalty due to advices: None (2 <= 2 limit)
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00

SW metrics:		Total	Average	Maximum	Function name
	Functions:	6	--	--	--
	Lines of code:	113	18.83 ± 9.99	32	findHashEx
	Cyclomatic complexity:	24	4.00 ± 2.00	7	main

12	**2023-04-05 15:55:45**	**Download**
Submission status:	Evaluated	
Evaluation:	0.0000	

- **Evaluator: computer**
  - Program compiled
  - Test 'Basic test with example input data': Abnormal program termination (Segmentation fault/Bus error/Memory limit exceeded/Stack limit exceeded)
    - Total run time: 0.008 s (limit: 15.000 s)
    - Mandatory test failed, evaluation: 0.00 %
  - Overall ratio: 0.00 %
- Advices used: 2
- Penalty due to advices: None (2 <= 2 limit)
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00

SW metrics:		Total	Average	Maximum	Function name
	Functions:	6	--	--	--
	Lines of code:	115	19.17 ± 10.02	32	findHashEx
	Cyclomatic complexity:	25	4.17 ± 2.48	9	main

11	**2023-04-05 15:47:03**	**Download**
Submission status:	Evaluated	
Evaluation:	0.0000	

- **Evaluator: computer**
  - Program compiled
  - Test 'Basic test with example input data': Abnormal program termination (Segmentation fault/Bus error/Memory limit exceeded/Stack limit exceeded)
    - Total run time: 0.010 s (limit: 15.000 s)
    - Mandatory test failed, evaluation: 0.00 %
  - Overall ratio: 0.00 %
- Advices used: 2
- Penalty due to advices: None (2 <= 2 limit)
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00

SW metrics:		Total	Average	Maximum	Function name
	Functions:	6	--	--	--
	Lines of code:	112	18.67 ± 10.43	32	findHashEx
	Cyclomatic complexity:	25	4.17 ± 2.48	9	main

10	**2023-04-05 15:45:45**	**Download**
Submission status:	Evaluated	
Evaluation:	0.0000	

- **Evaluator: computer**
  - Compile in 'basic' mode failed. **[Unlock advice (428 B)]**
- Advices used: 2
- Penalty due to advices: None (2 <= 2 limit)
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00

9   **2023-04-03 13:19:01**   **Download**

Submission status:	Evaluated
Evaluation:	0.0000

- **Evaluator: computer**
  - Program compiled
  - Test 'Basic test with example input data': failed
    - result: 80.00 %, required: 100.00 %
    - Total run time: 0.001 s (limit: 15.000 s)
    - Mandatory test failed, evaluation: 0.00 %
    - Failed (invalid output) **[Unlock advice (56 B)]**
  - Overall ratio: 0.00 %
- Advices used: 2
- Penalty due to advices: None (2 <= 2 limit)
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00

SW metrics:

	Total	Average	Maximum	Function name
Functions:	**6**	--	--	--
Lines of code:	**119**	**19.83 ± 10.49**	**32**	findHashEx
Cyclomatic complexity:	**31**	**5.17 ± 3.58**	**11**	checkHash_t

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8   **2023-04-02 08:47:07**   **Download**

Submission status:	Evaluated
Evaluation:	0.0000

- **Evaluator: computer**
  - Program compiled
  - Test 'Basic test with example input data': failed
    - result: 80.00 %, required: 100.00 %
    - Total run time: 0.001 s (limit: 15.000 s)
    - Mandatory test failed, evaluation: 0.00 %
    - Failed (invalid output) **[Unlock advice (56 B)]**
  - Overall ratio: 0.00 %
- Advices used: 2
- Penalty due to advices: None (2 <= 2 limit)
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00

SW metrics:

	Total	Average	Maximum	Function name
Functions:	**6**	--	--	--
Lines of code:	**141**	**23.50 ± 7.34**	**32**	findHashEx
Cyclomatic complexity:	**41**	**6.83 ± 3.58**	**11**	checkHash

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7   **2023-04-02 08:46:02**   **Download**

Submission status:	Evaluated
Evaluation:	0.0000

- **Evaluator: computer**
  - Program compiled
  - Test 'Basic test with example input data': failed
    - result: 60.00 %, required: 100.00 %
    - Total run time: 0.001 s (limit: 15.000 s)
    - Mandatory test failed, evaluation: 0.00 %
    - Failed (invalid output) **[Unlock advice (56 B)]**
    - Failed (invalid output) **[Unlock advice (56 B)]**
  - Overall ratio: 0.00 %
- Advices used: 2
- Penalty due to advices: None (2 <= 2 limit)
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00

SW metrics:

	Total	Average	Maximum	Function name
Functions:	**6**	--	--	--
Lines of code:	**141**	**23.50 ± 7.34**	**32**	findHashEx
Cyclomatic complexity:	**41**	**6.83 ± 3.58**	**11**	checkHash

6	2023-04-02 08:45:14	Download

Submission status: Evaluated
Evaluation: 0.0000

- **Evaluator: computer**
  - Program compiled
  - Test 'Basic test with example input data': failed
    - result: 40.00 %, required: 100.00 %
    - Total run time: 0.001 s (limit: 15.000 s)
    - Mandatory test failed, evaluation: 0.00 %
    - Failed (invalid output) **[Unlock advice (56 B)]**
    - Failed (invalid output) **[Unlock advice (56 B)]**
    - Failed (invalid output) **[Unlock advice (56 B)]**
  - Overall ratio: 0.00 %
- Advices used: 2
- Penalty due to advices: None (2 <= 2 limit)
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00

SW metrics:		Total	Average	Maximum	Function name
	Functions:	**6**	--	--	--
	Lines of code:	**142**	**23.67 ± 7.39**	**32**	findHashEx
	Cyclomatic complexity:	**42**	**7.00 ± 3.79**	**12**	checkHash

5	2023-04-02 08:40:39	Download

Submission status: Evaluated
Evaluation: 0.0000

- **Evaluator: computer**
  - Program compiled
  - Test 'Basic test with example input data': failed
    - result: 60.00 %, required: 100.00 %
    - Total run time: 0.001 s (limit: 15.000 s)
    - Mandatory test failed, evaluation: 0.00 %
    - Failed (invalid output) **[Unlock advice (56 B)]**
    - Failed (invalid output) **[Unlock advice (56 B)]**
  - Overall ratio: 0.00 %
- Advices used: 2
- Penalty due to advices: None (2 <= 2 limit)
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00

SW metrics:		Total	Average	Maximum	Function name
	Functions:	**6**	--	--	--
	Lines of code:	**139**	**23.17 ± 7.31**	**32**	findHashEx
	Cyclomatic complexity:	**42**	**7.00 ± 3.79**	**12**	checkHash

4	2023-04-02 08:32:40	Download

Submission status: Evaluated
Evaluation: 0.0000

- **Evaluator: computer**
  - Program compiled
  - Test 'Basic test with example input data': failed
    - result: 80.00 %, required: 100.00 %
    - Total run time: 0.001 s (limit: 15.000 s)
    - Mandatory test failed, evaluation: 0.00 %
    - ☐ Failed (invalid output)
  - Overall ratio: 0.00 %
- Advices used: 1
- Penalty due to advices: None (1 <= 2 limit)
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00

SW metrics:		Total	Average	Maximum	Function name
	Functions:	**6**	--	--	--
	Lines of code:	**141**	**23.50 ± 7.34**	**32**	findHashEx

	Cyclomatic complexity:	**41**	**6.83 ± 3.58**	**11** `checkHash`

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3 | **2023-04-02 08:31:51** | | | **Download**

Submission status:	Evaluated
Evaluation:	0.0000

- **Evaluator: computer**
  - Compile in 'basic' mode failed. **[Unlock advice (555 B)]**
- Advices used: 1
- Penalty due to advices: None (1 <= 2 limit)
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00

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2 | **2023-04-02 08:30:15** | | | **Download**

Submission status:	Evaluated
Evaluation:	0.0000

- **Evaluator: computer**
  - ☐ Compile in 'basic' mode failed.
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00

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1 | **2023-04-02 08:29:10** | | | **Download**

Submission status:	Evaluated
Evaluation:	0.0000

- **Evaluator: computer**
  - Compile in 'basic' mode failed. **[Unlock advice (311 B)]**
- Total percent: 0.00 %
- Total points: 0.00 * 5.00 = 0.00