Klausurangabe 22.02.2021

Information

Frage markieren

Important information

- Answers allowed both in German and English.
- True/False-Questions-Blocks: 1P per correct answer, -1P for incorrect answer, 0P if not answered (or "Don't know"). Negative points are only applied to the current question block (less than zero points per block are not possible).
- Free text answers: Formulate your answer complete but concise!
- Calculation/Drawing tasks: Make sure to provide all intermediate steps to make them reproducible!

Note: The exam consists of multiple pages of questions! You can answer them in any order.

Frage **1**

Bisher nicht beantwortet

Erreichbare Punkte: 6,00

Frage markieren

Mark the correct options.

- The Instruction Pointer stores the address of the next instruction in working memory.
  ○True ○False ○Don't know
- Machine Instructions consist of Instruction Pointer, Operation Code, and Operand Value.
  ○True ○False ○Don't know
- The word size of an architecture defines the number of bits that can be processed in one cycle.
  ○True ○False ○Don't know
- Larger Cache sizes result in better processor performance.
  ○True ○False ○Don't know
- A compiler interprets the program (or parts of it) during execution.
  ○True ○False ○Don't know
- An Interpreter allows for better code optimization than a compiler.
  ○True ○False ○Don't know

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Frage **2**

Bisher nicht beantwortet

Erreichbare Punkte: 6,00

Frage markieren

Mark the correct options.

- Lexical analysis splits the source code into separate words (tokens).
  ○True ○False ○Don't know
- Regular expressions are more powerful than finite automata.
  ○True ○False ○Don't know
- Regular expressions can be used to search/replace patterns in text.
  ○True ○False ○Don't know
- EBNF is a notation for context-free grammars to define programming languages.
  ○True ○False ○Don't know
- A Turing machine is a mathematical model of a computation machine.
  ○True ○False ○Don't know
- A Turing machine can solve the halting problem.
  ○True ○False ○Don't know

Frage **4**

Bisher nicht beantwortet

Erreichbare Punkte: 6,00

Frage markieren

Mark the correct options.

- Network layers add headers to encapsulate messages received from the layer above.
  ○True ○False ○Don't know
- In the ISO-OSI network model, the application layer is the highest layer.
  ○True ○False ○Don't know
- Internetworks allow addressing nodes of connected Intranets.
  ○True ○False ○Don't know
- Internet routers must maintain TCP control information.
  ○True ○False ○Don't know
- The Internet Protocol (IP) requires only IP addresses to route packets to receiving applications.
  ○True ○False ○Don't know
- HTTP specifies how webpages are encoded.
  ○True ○False ○Don't know

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Frage **5**

Bisher nicht beantwortet

Erreichbare Punkte: 4,00

Frage markieren

Name the four generations of electronic computer designs.

1.
2.
3.
4.

Frage **6**

Bisher nicht beantwortet

Erreichbare Punkte: 4,00

Frage markieren

What does UDP stand for?

Name two specific properties of UDP.

UDP stands for:

Two specific properties of UDP:

1.
2.

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Frage **7**

Bisher nicht beantwortet

Erreichbare Punkte: 2,00

Frage markieren

What is stated by Moor's law?

Frage **8**

Bisher nicht beantwortet

Erreichbare Punkte: 2,00

Frage markieren

Name two example use cases of a Tree data structure.

1.
2.

Frage **9**

Bisher nicht beantwortet

Erreichbare Punkte: 2,00

Frage markieren

Please give two different examples of distributed systems.

1.
2.

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Frage **10**

Bisher nicht beantwortet

Erreichbare Punkte: 10,00

Frage markieren

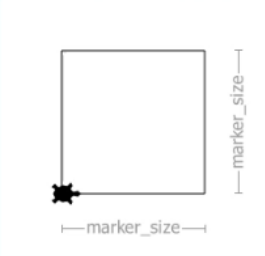
You get the following data points and need to visualize them with the Python turtle module.

X	Y
-50	25
0	-25
50	0
100	25
150	40

Part of the code is already implemented, you only need to fill in a few missing pieces:

1. **Put the data into the code.**
   Create a data structure that holds the provided data points.
   To do so, define a variable *coords*. The value of *coords* should be a **list**, containing a **tuple** for each (X, Y) coordinate pair of the provided data (3p).

2. **Draw a visualization.**
   Fill in the function *draw* to draw one square with side length **marker_size** (provided as an argument) using turtle movement functions. (3p).



3. **Compute and print values.**
   Add a new function *average* that **prints** the average of all Y values (4p):

$$\frac{Y_0 + Y_1 + Y_2 + Y_3 + Y_4}{5}$$

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Use 4 spaces to indent code blocks (Tab does not work here). Your solution only needs to work for the provided data points.

```
from turtle import *

# [1.] define the variable `coords` here


def draw(marker_size):
    # [2.] draw a square here


def draw(marker_size):
    # [2.] draw a square here


# [3.] implement your new function `average` here



# You do not need to change anything below this line.

# The following code draws a square at each position
# in `coords` using `draw()` and computes the
# average with `average()`.
for i in range(len(coords)):
    coord = coords[i]
    penup()
    goto(coord)
    pendown()
    write(i)
    draw(10)

average()
```

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The following question is a **bonus question**! It enables you to gain additional points, but does not reduce your score if not answered!

Frage **11**

Bisher nicht beantwortet

Erreichbare Punkte: 4,00

Frage markieren

Given are the following relations:

SERVICE (ServiceID , ServiceName , ServiceType , ProviderName)

SUBSCRIPTION (SubscriptionID , CustomerID , ServiceID_)

Please give the **SQL statement** for the following queries:

1. Report a list of ServiceIDs for all service providers
2. Report the ServiceNames and ServiceTypes by the Provider named "E Corp"
3. Report which CustomerID subscribed the service named "Tripleplay"

1. Report a list of all ServiceProviderIDs:

2. Report the ServiceNames and ServiceTypes by the Provider named "E Corp":

3. Report which CustomerID subscribed the service named "Tripleplay":