


Instructions

The basic structure of a task is based on well-established concepts where an object is moving along a path defined by the program. Each task consists of the object (car -  Tesla model S) on a rectangular grid with marked columns and rows, a screen to display printed messages and a section where a program is written in simple pseudocode. The basic elements of pseudocode are the *print*, *turn* and *go* command. The *print* command prints messages on the car display. The *turn* commands (*left*, *right*) change the orientation of the car. The *go* command consists of travel directions (*forward*, *backward*) and the number of squares a car must travel. The pseudocode also includes selection commands (*if condition*, *else*), iteration commands (*repeat number of times*, *repeat until condition*, *repeat for every square*), main and subprogram commands (*program*, *subprogram*).

There are five different types of tasks:

- Students must read the program and outline the path accordingly.
- Students must complete the program according to the path already outlined.
- Students must debug and correct the program according to the path already outlined. Errors can be labelled or not labelled.
- Students must create the program according to the path already outlined.
- Students must choose the correct answer according to the path already outlined.

Example

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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Car screen




R10

Program

```

program pathTrevelled
  go forward 3 squares
  turn right
  go forward 2 squares
  print currentLocation
  
```

Comments

	Car
	Start
	Outlined trace

Pseudocode guide

currentLocation is a unique variable that holds current location of the car on its path – e.g.
currentLocation = 'R10'

Variable (italic, bold, colour: dark grey)

```
noSquares = 0  
noSquares += 1  
noSquares == 3  
stringForPrint = 'not in column no. 4'
```

Iteration commands

```
program pathTravelled  
  repeat 7-times  
    go forward 1 square
```

```
program pathTravelled  
  Repeat until a == 3  
    go forward 2 squares
```

```
program pathTravelled  
  repeat for each square on the path  
    go forward 3 squares
```

Selection commands

```
program pathTravelled  
  if you are in row P  
    go forward 4 squares  
  else  
    go forward 5 squares
```

```
program pathTravelled  
  if you are in column no. 3  
    if you are in row L  
      stop travelling  
    go forward 6 squares
```

Subprogram commands

```
subprogram partPath  
  go forward 7 squares  
  
program pathTravelled  
  go forward 1 square  
  run subprogram partPath
```

2. task. The car is at the end of the path. Choose the program (circle the letter A; B; C) that correctly describes the path travelled.

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Car screen

Program

```
A
program pathTravelled
  repeat 7-times
    if you are in row N
      turn left
      go forward 5 squares
    go forward 1 square
```

```
B
program pathTravelled
  repeat 7-times
    go forward 1 square
  if you are in row N
    turn left
    go forward 5 squares
```

```
C
program pathTravelled
  if you are in row N
    turn left
    go forward 5 squares
  repeat 7-times
    go forward 1 square
```

Comments

4. task. Outline the path and write notifications on the car screen.

Št.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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Car screen

Program

```
program pathTravelled
  noSquares = 1
  noSquares = 2
  noSquares = 3
  go forward noSquares squares
  print currentLocation
  print noSquares
```

Comments

6. task (EXCLUDED FROM STUDY DUE TO POOR DESIGN). Outline the path and write notifications on the car screen.

Št.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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Car screen

Program


```

program pathTravelled
  noRepetition = 4
  stringForPrint = 'five'
  go forward noRepetition squares
  stringForPrint = noRepetition
  go forward noRepetition squares
  print currentLocation
  print stringForPrint

```

Comments

8. task. Outline the path and write notifications on the car screen.

Št.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A															
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Car screen

Program

```

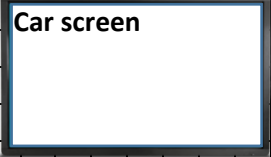
program pathTravelled
  goBackward = 2
  repeat goBackward-times
    go forward 2 squares
    print currentLocation

```

Comments

10. task. Outline the path.

Št.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A															
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Program

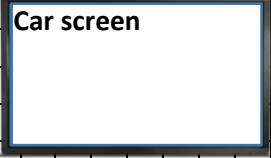
```

program pathTravelled
  go forward 4 squares
  if you are in row P
    turn right
    go forward 3 squares
  else
    go forward 1 square
    turn left
    go forward 5 squares
  
```

Comments

12. task. Outline the path and write notifications on the car screen.

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Program

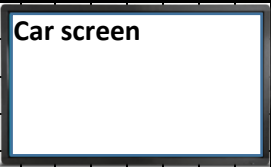
```

program pathTravelled
  print 'Sem na začetku poti'
  go forward 3 squares
  if you are in row D
    go forward 5 squares
  print currentLocation
  
```

Comments

14. task. Outline the path and write notifications on the car screen.

Št.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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Car screen



Program

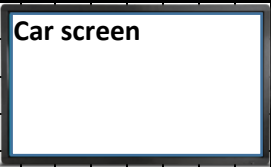
```

program pathTravelled
  a = 3
  turn right
  go forward 7 squares
  turn left
  go forward 2 squares
  turn left
  repeat
    if you are in column no. > a+1
      go forward 1 square
    else
      print 'stop travelling'
      stop travelling
  
```

Comments

16. task. The car is at the end of the path. Complete (or circle the letter) the program so that the car will travel to the start location (U8).

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Car screen



Program

```

program pathTravelled
  go forward 12 squares
  print 'go to start location'
  noSquares = 
  go forward noSquares squares
  go forward noSquares squares
  go forward noSquares squares
  
```

Choose:

- A) -12
- B) -6
- C) -4

Comments

18. task. The car is at the end of the path. Choose the path (circle the letter) which is outlined with the program.

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Car screen

Program

```

program pathTravelled
  repeat 3-krat
    go forward 4 squares
    turn left
    go forward 2 squares
    turn right
  
```

- A) path outlined with grey colour
- B) path outlined with blue colour
- C) path outlined with yellow colour

Comments

20. task. Outline the path and write notifications on the car screen.

Št.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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Car screen

Program

```

program pathTravelled
  noRepetitions = 3
  repeat, until noRepetitions == 0
    go forward noRepetitions squares
    noRepetitions -= 1
  print noRepetitions
  
```

Comments

22. task. The car is at the end of the path. Write variable value of *noSquares* on the car screen.

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Car screen

Program

```

program pathTravelled
  noSquares = 0
  repeat for each square on the path
    go forward 1 square
    noSquares += 1
    if you are in row L and column no. 8
      turn right
  print noSquares
  
```

Comments

24. task. Outline the path.

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Car screen

Program

```

subprogram partPath1
  repeat until you are in row H
    go forward 1 square
  turn left

subprogram partPath2
  go forward 3 squares

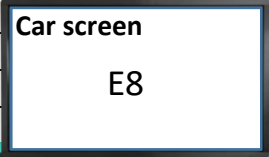
subprogram partPath3
  go forward 2 squares

program pathTravelled
  turn right
  go forward 3 squares
  turn left
  run subprogram partPath2
  run subprogram partPath1
  run subprogram partPath3
  
```

Comments

26. task. The car is at the end of the path. Choose (circle the letter) the simplest or the most efficient program.

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Program

A

```

program pathTravelled
  noSquares = 0
  repeat until you are in row E
    go forward noSquares squares
    noSquares += 1
  print currentLocation
  
```

B

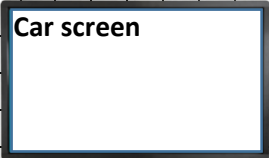
```

program pathTravelled
  noSquares = 0
  repeat
    if you are in row E
      stop travelling
    go forward 1 square
    noSquares = noSquares + 1
  print currentLocation
  
```

Comments

28. task. The car is at the end of the path. Debug the program so that the car will travel along outlined path.

Št.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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Program

```

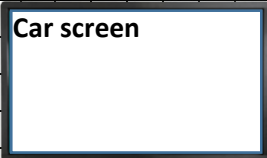
program pathTravelled
  repeat
    If you are in column no. 8
      if you are in row M
        stop travelling
      go forward 1 square
  
```

Comments

30. task (EXCLUDED FROM STUDY DUE TO POOR DESIGN). Create 3 different programs with 3 different travel paths that will direct the car to the specific destination (**C**). The only rule is that command 'go forward' is always followed by command 'turn left' or 'turn right', followed by 'go forward' with the same amount of squares – e.g.

```
go forward za 5 squares
turn right
go forward za 5 squares
```

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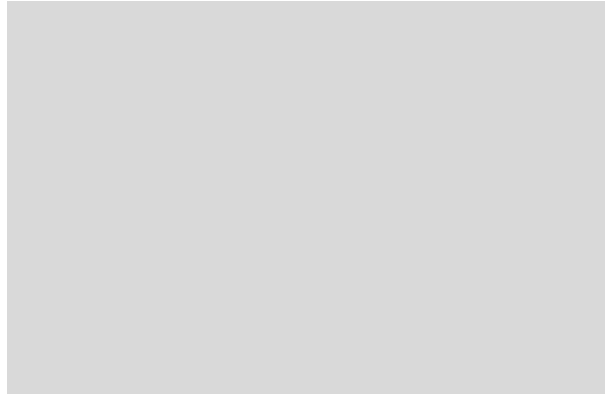


C

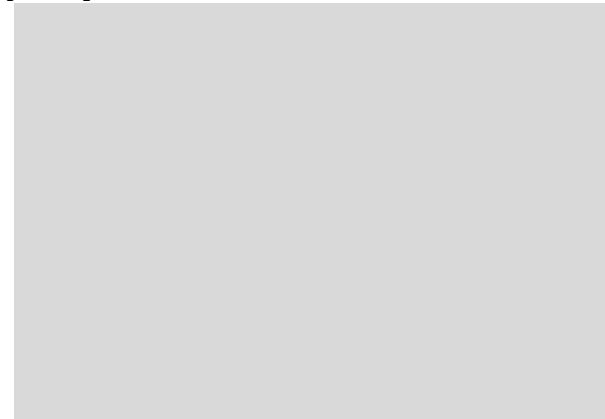


Program

program pathTravelled



program pathTravelled



program pathTravelled

