


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 pathTravelled
  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
```

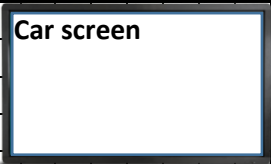
```
program prepotovanaPot  
  if you are in column no. 3  
    if you are in row L  
      stop travelling  
    go forward 6 squares
```

Subprogram commands

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

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

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

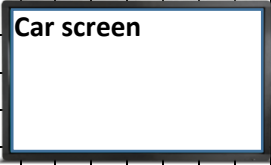
```

program pathTravelledPot
    sumSquares = 0
    noSquares1 = 0
    noSquares2 = 0
    sumSquares = noSquares1 + noSquares2
    noSquares1 = 3
    noSquares2 = 4
    go forward sumSquares squares
    turn right
    go forward sumSquares+2 squares
    print currentLocation
    
```

Comments

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

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Program

```

program pathTravelled
    noSquares1 = 'one'
    noSquares2 = 'three'
    go forward 3 squares
    print currentLocation
    go forward noSquares2 squares
    go forward noSquares1 squares
    
```

Comments

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

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


Program

```

program pathTravelled
    noSquaresA = 3
    noSquaresB = 2
    noSquaresA = noSquaresB
    go forward noSquaresA squares
    turn left
    go forward noSquaresB squares
    print currentLocation
    
```

Comments

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

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

Program

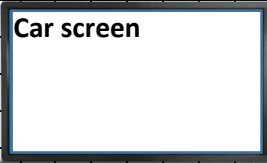
```

program pathTravelled
    small = 5
    big = 1
    big = small
    go forward big squares
    turn left
    go forward small squares
    print currentLocation
    
```

Comments

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

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Program

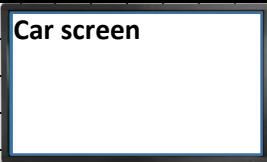
```

program pathTravelled
  a = 1
  b = a + 1
  go forward a squares
  print currentLocation
  print b
  
```

Comments

11. task. The car is at the end of the path. Choose the program (circle the letter) that correctly describes the path travelled. Write the notifications of the current location in meaningful way. Possible answers are: A; B; A in B.

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Program

A

```

program pathTravelled
  repeat 5-times
    if you are in row P
      print 'P'
    else
      print 'not in row P'
  go forward 1 square
  
```

B

```

program prepotovanaPot
  repeat 5-times
    if you are in row P
      print 'P'
  print 'not in row P'
  go forward 1 square
  
```

Comments

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

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

Program

```

program pathTravelled
  go forward 7 squares
  if you are in row M or column no. 8
    go forward 3 squares
    print 'I am at the finish'
  else
    print 'I am not at the finish'

```

Comments

15. 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

```

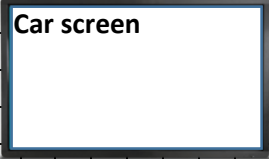
program pathTravelled
  go forward 6 squares
  if you are in row L
    print 'I am in row L'
  go forward 2 squares
  turn left
  go forward 1 square

```

Comments

17. Task. Outline the path.

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Program

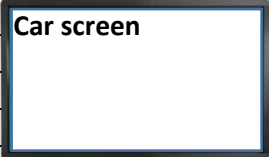
```

program pathTravelled
  repeat 7-times
    go forward 2 squares
    turn right
    go forward 1 square
    turn left
  
```

Comments

19. task. Outline the path.

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Program

```

program pathTravelled
  a = 1
  repeat until a == 3
    a += 1
    go forward a squares
  
```

Comments

21. task. The car is at the end of the path. Choose the program (circle the letter) that correctly describes the path travelled. Several answers are possible.

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Car screen
The end of the path

Program

A

```

program pathTravelled
  repeat 4-times
    turn left
    go forward 1 square
    turn right
    go forward 3 squares
  print 'The end of the path'
  
```

B

```

program prepotovanaPot
  Repeat
    if you are in column no. 4
      print 'The end of the path'
      stop travelling
    turn left
    go forward 1 square
    turn right
    go forward 3 squares
  
```

C

```

program prepotovanaPot
  repeat
    turn left
    go forward 1 square
    turn right
    go forward 3 squares
    if you are in column no. 4
      print 'The end of the path'
      stop travelling
  
```

D

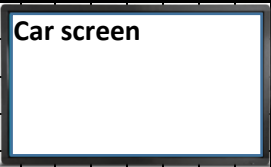
```

program prepotovanaPot
  repeat until you are in column no. 4
    turn left
    go forward 1 square
    turn right
    go forward 3 squares
  print 'The end of the path'
  
```

Comments

23. task. Outline the path.

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

```

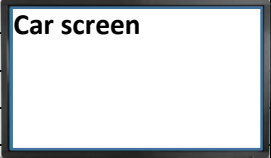
subprogram partPath
  turn left
  go forward 7 squares

program pathTravelled
  turn right
  go forward 7 squares
  run subprogram partPath
  
```

Comments

25. naloga. The car is at the end of the path. Complete the program so the car will travel along the outlined path. At each turn, the car consumes a certain amount of electricity. The consumed electricity is equal to the column number in current location. Program must sum the total consumption of electricity (*sumElectricity*) and also count the number of squares on the travelled path (*countSquares*). The program must print variable values (*sumElectricity*, *countSquares*) on the car screen.

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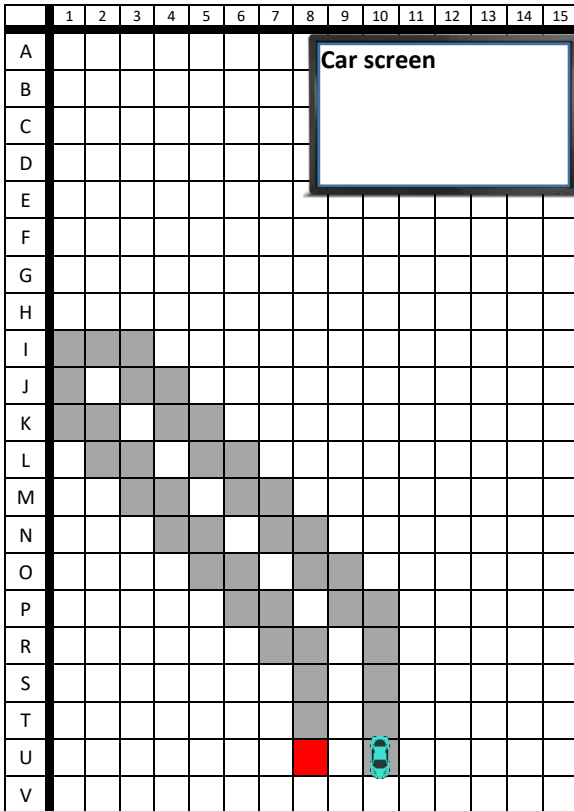


Program

```

program pathTravelled
  sumElectricity = 0
  countSquares = 0
  repeat for each square on the path
    if current location is 'R8'
    if current location is 'R5'
    if current location is 'N5'
    if current location is 'R11'
  
```

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

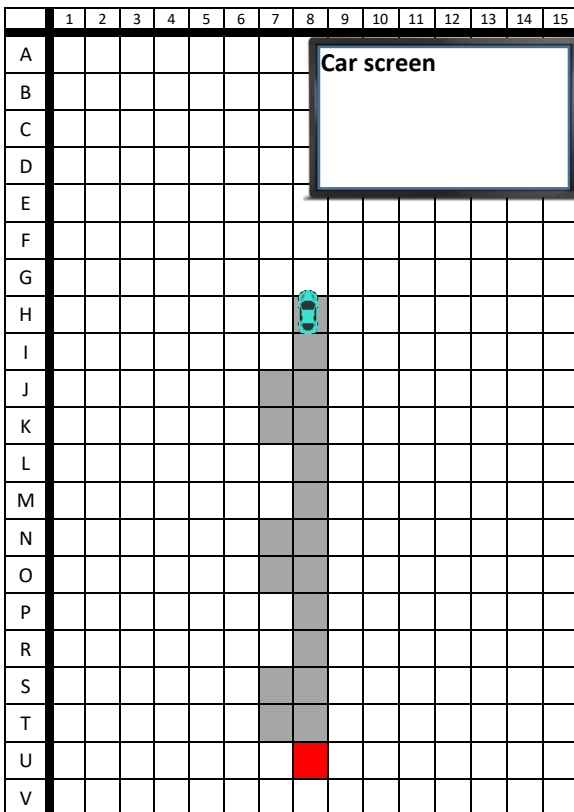


Program

```

program pathTravelled
  go forward 2 squares
  repeat 7-times
    go forward 1 square
    turn left
    go forward 1 square
    turn right
  go forward 2 squares
  turn right
  go forward 2 squares
  turn right
  repeat 7-times
    go forward 1 square
    turn right
    go forward 1 square
    turn left
  go forward 4 squares
  
```

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



Program

```

program pathTravelled
  
```

