

Edexcel GCE

Applied Information and Communication Technology

Unit 3: The Knowledge Worker

May 2013
Scenario

Paper Reference
6953/01

The scenario should be distributed to candidates at least three working weeks before the examination.

Practice files: TDistances_practice.txt, THeights_practice.txt,
Tour de Tournesol_practice.xls, Map.pdf

This scenario should be used for the purposes of preparing candidates for the examination. This copy **must not** be taken into the examination. The information contained in the scenario will be included in the examination paper.

Further details are in the Instructions of the Conduct of Examinations (ICE), available from the Edexcel website for this qualification.

Edexcel will not accept any request for special consideration should candidates be given the incorrect scenario for the examination they are sitting.

Turn over ►

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Scenario

Tour de Tournesol

Sunflowers have become a popular crop in the Mannot district of southern France. They are easy to grow and harvest. Over the summer the flowers grow and in August they start to die. To harvest the crop the farmer brings in machinery, which cuts off the heads of the sunflowers and filters out the seeds. Fields of dead sunflowers with their heads bowed, waiting for decapitation, are a sad sight but for a few weeks in July the fields are a sea of yellow as thousands of sunflowers, tall and proud, turn their faces to the sun.

Always ready for a celebration, the nine towns in the area have traditionally marked this period with a cycle race. This is called the 'Tour de Tournesol'. The event starts on a Monday and ends with a huge party on the following Sunday. The race is supposed to be light-hearted but the fierce rivalry between the towns means that the outcome of the race carries considerable kudos for the winning town and competitors. Flying the 'Golden Sunflower' flag above the town hall, as the winning town, has become a matter of civic pride.

In most races, the person who completes the course in the shortest time wins. Cycle races such as the 'Tour de Tournesol' are a little more complex.

The overall champion is the cyclist whose aggregate times for the six stages (one stage every day from Monday to Saturday) is the shortest. There are three other competitions within the event. These are the Team Race, King of the Mountains, and the Sprint Cup. Care must be taken designing the course as some of these competitions have specific terrain requirements.

The race takes place in the area around the nine towns. The map shows the roads that can be used for the race. A checkpoint is where two or more roads cross. These are either towns or named points of interest. Town names are shown in bold. The course is built by selecting the next checkpoint to head towards.

There are six stages in the race. A stage must start in one of the nine biggest towns. All the towns are keen to host the race as it brings business to the town. A stage has to finish in the town in which it started. The start/finish line for each stage is always in front of the town hall. The politics of the event mean that the race must go through all nine towns at some point. Stages must be at least 150 km but must not exceed 200 km.

The Overall Champion (Yellow Jersey)

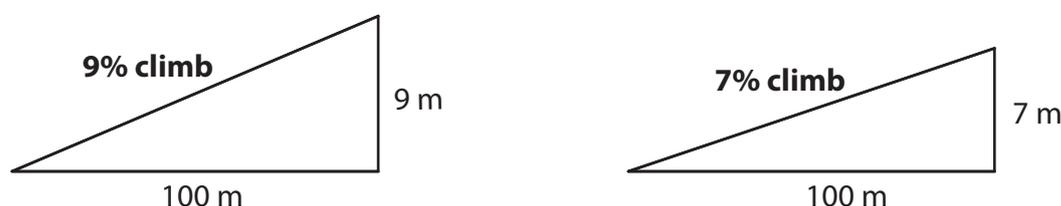
The riders all start together. Each rider is given an individual time for each stage. The time is recorded by spotters using a large stop clock mounted on the top of a van. If a rider fails, for any reason, to complete a stage they can take no further part in the competition. After the first stage the rider with the lowest aggregate time wears a yellow jersey.

The Team Race (Golden Sunflower)

The Team Race also works on aggregate times. Each town has a team of five riders. At the end of each stage the team gets a Stage Team Time. This is the time taken for the fastest three riders from the team to complete the stage. The Stage Team Times for each team are added together and the town with the shortest Overall Team Time is awarded the 'Golden Sunflower'. The same riders do not have to provide the times in each stage.

King of the Mountains (Polka Dot Jersey)

The King of the Mountains is a 'points' competition. Two of the stages of the event have to be climb stages. A climb stage is defined as having either two category 1 climbs or a category 1 climb and a category 2 climb. Both category 1 and 2 climbs should be uphill sections of at least 10 kilometres. A category 1 climb should average greater than or equal to 9% (see diagram) and a category 2 climb should average in excess of 7% but less than 9%.



Spotters are placed at the checkpoints, which mark the top of each climb. The first ten riders past the checkpoint are awarded points. 10 for the first rider, 9 for the second, 8 for the third, and so on, down to 1 point for the tenth rider. The King of the Mountains is the rider with the most points at the end of the climb stages and is entitled to wear a white jersey with red polka dots.

The Sprint Cup (Green Jersey)

The Sprint Cup is also a points competition. One stage of the event must be designated the Sprint Stage. A Sprint Stage can have no climbs greater than 5%. Spotters are placed at six of the checkpoints in this stage (not the start and finish points) to record the first ten riders to go past. As with the King of the Mountains, 10 points are allocated to the first rider, 9 for the second, etc. At the end of the stage the rider with the most points is awarded the Sprint Cup and entitled to wear the Green Jersey for the rest of the event.

Description of the model

Serge DuLac has designed the route for the 'Tour de Tournesol' for many years. Recently he has been working on a spreadsheet model to make this task easier. Unfortunately, before he finished the model, he was called away to Paris as his mother was ill. The organisers have asked you to finish the model and design the route for the 2013 event. Serge has left you a few notes.

Worksheet	Description
Stage Builder	<p>I was going to use this worksheet to try different routes.</p> <p>There is an area on the worksheet to choose which stages are the climbs, which is the sprint and which are just normal stages. There is a mechanism to ensure all the towns are visited and I intended to put in a number of other checks as well.</p> <p>For each stage there are drop-down boxes to choose the start point and subsequent checkpoints. The initial contents of these cells is 'No Path'. In this model 'No Path' has two meanings. In this case it means that the cell is not used on the route.</p> <p>When I tested this I found that if I made a mistake on a stage, I had to set the whole stage back to 'No Path' before I tried again.</p> <p>I decided that no stage would pass more than 20 checkpoints, otherwise it is likely to be too long.</p>
SprintClimb	<p>This worksheet is to help with the design of climbs and sprints. It will show the rate of climb between adjacent checkpoints.</p>
Height above Sea Level	<p>This worksheet will display the height above sea level for all selected checkpoints for each stage.</p>
Relative	<p>This worksheet is a numerical version of the map. Each checkpoint is at a junction, where there are up to four possibilities for the route. This worksheet defines the checkpoints that could be next if a particular route was taken. Zero stands for 'No Path', which here means that that route would take you out of the race area.</p>
Distances	<p>This worksheet will contain the distances between adjacent checkpoints. My friend Raoul has been out and walked them all with a pedometer. In the model the distances are rounded to the nearest kilometre.</p>

Height	Raoul also has a very expensive watch that he uses for his hobby, mountaineering. It has an altimeter on it and he has recorded the height of each checkpoint above sea level. His watch displays this in metres. The worksheet also calculates the difference in height between adjacent checkpoints and the rate of ascent or descent as a percentage.
Checkpoints	This worksheet contains the names and numbers allocated to the checkpoints. This means a checkpoint name can be found out if you are given the checkpoint number, and vice versa.
Distance Calculation	The distances between the checkpoints chosen are calculated in this worksheet and the total distance for a stage worked out.
Climb Calculation	This worksheet calculates the climbs. Climbs are aggregated; this means you might find an 8% climb immediately followed by a 2% climb of equal length ending up as a 5% climb overall.

There are some things within the model that I haven't been asked for but thought it might be fun to do. I hope you find these useful.

Serge Dubac

Some cells in the model are password protected. During your use of the model you may have to unprotect worksheets; the password for this is *edexcel*. Be aware that if you change the contents of any protected cell the model may not work.