Oil Rig Personal Transportation
Have you ever wished that your journey to school or work was a little shorter or a cheaper? Well consider the journey of an oil rig worker whose place of work is ‘offshore’ and can only be accessed by helicopter. Luckily this journey cost is met by the oil rig company and for them just getting employees to work calls for some careful financial calculations.

To transport employees to an oil rig the company would ‘charter’ a helicopter. The two most popular sizes of helicopter are the Sikorsky S76, which carries a maximum of 6 passengers, and the Agusta Westland AW139, which carries a maximum of 7 passengers.

The charges for each helicopter flight are made up of several separate costs as detailed in the table below:

<table>
<thead>
<tr>
<th>Aircraft Type</th>
<th>Sikorsky S76</th>
<th>Agusta Westland AW139</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charge per flying hour</td>
<td>£3,700</td>
<td>£4,043</td>
</tr>
<tr>
<td>Landing Charge</td>
<td>£46.80</td>
<td>£52</td>
</tr>
<tr>
<td>Navigation Charge</td>
<td>£71.28</td>
<td>£79.20</td>
</tr>
<tr>
<td>Navigation Charge En Route</td>
<td>£318</td>
<td>£318</td>
</tr>
<tr>
<td>Handling Weekdays / Weekends</td>
<td>£52.96 / £57.53</td>
<td>£52.96 / £57.53</td>
</tr>
<tr>
<td>Charger per in bound passenger</td>
<td>£7.02</td>
<td>£7.02</td>
</tr>
</tbody>
</table>

Each helicopter is also limited to a maximum load capacity, given by the formula below, which must also be taken into consideration when planning journeys.

Max load capacity (kgs) = 95kg per passenger + 15 kg luggage per passenger
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**TASK 1**

What is max available load capacity for each helicopter?

**TASK 2**

What are minimum costs for the following journeys?

a. 6 personnel + 15kg luggage each, to a rig 30 minutes from port, weekday

b. 7 personnel + 15kg luggage each, to a rig 30 minutes from port, weekday

c. 3 personnel with no luggage, on a **return** journey to a rig 30 minutes from port, weekday

d. 6 personnel with no luggage, on a **return** journey to a rig 30 minutes from port, weekday

e. 5 personnel + a single 150kg luggage, to port 30 minutes from a rig, weekend

f. 6 personnel + a single 150kg luggage, to port 30 minutes from a rig, weekend

g. 7 personnel + a single 150kg luggage, to a port 30 minutes from a rig, weekend

h. 5 personnel + a single 225kg luggage, to a port 30 minutes from a rig, weekend

i. 6 personnel + 20kg luggage each, on a **return** journey to port 15 minutes from a rig, weekday
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j. 7 personnel with no luggage, on a return journey to a rig 20 minutes from port, weekend

k. 12 personnel with 15kg luggage each to a rig 10 minutes from port, weekday

l. As above except one person must take a luggage of 20kg

m. In parts (k) & (l) above, how much more would the extra 5kg cost to transport?

n. 11 personnel with 20kgs luggage each from to a rig 25 minutes to port, weekday

o. As above except 25kgs luggage each

p. As above except 30kgs luggage each

q. 12 personnel, 6 with 10kg luggage, 6 with 15kg luggage plus another single luggage of 100kg to leave at rig, to rig Friday, return Saturday

For each of the above journeys calculate the cost per passenger.
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ANSWERS

TASK 1

Max available load capacities for each helicopter:
S76 = 660kg, AW139 = 770kg

TASK 2

a. £2339.04, £389.84
S76, weekday, 0.5hr flying time, 1 landing charge

b. £2523.66, £360.52
AW139, weekday, 0.5hr flying time, 1 landing charge

c. £4256.90, £1418.97
S76, weekday, 1hr flying time, 2 landing charges, 3 inbound passengers

d. £4277.96, £712.99
S76, weekday, 1hr flying time, 2 landing charges, 6 inbound passengers

e. £2378.71, £475.74
S76, weekend, 0.5hr flying time, 1 landing charge, 5 inbound passengers

f. £2570.35, £428.39
AW139, weekend, 0.5hr flying time, 1 landing charge, 6 inbound passengers

g. £2563.33, £512.67
AW139, weekend, 0.5hr flying time, 1 landing charge, 5 inbound passengers

h. £2617.78, £436.30
AW139, weekday, 0.5hr flying time, 2 landing charges, 6 inbound passengers
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For each of the above journeys calculate the cost per passenger. Costs per passenger are shown in second column above.

i. £3303.20, £471.89
AW139, weekend, 40mins flying time, 2 landing charges, 7 inbound psgrs

j. £2211.41, £184.28
2 x [S76, weekday, 10mins flying time, 1 landing charge]

k. £2281.70, £190.14
S76 & AW139 each [weekday, 10mins flying time, 1 landing charge]

l. £70.29

m. £4138.64, £376.24
2 x [S76, weekday, 25mins flying time, 1 landing charge, 5.5 in psgrs]

n. £4294.67, £360.92
1 x S76 and 1 x AW139 each [weekday, 25mins flying time, 1 landing charge, 5.5 in psgrs]

o. £4294.67, £360.92

As (n)
p. Complicated!