During the Second World War the Royal Air Force (RAF) had many

foreign pilots speaking different languages and more or less

trained on the different types of aircraft. The RAF had to form

pilot/co-pilot pairs (‘crews’) for every plane with a compatible

language and a sufficiently good knowledge of the aircraft type. In

our example there are eight pilots. In the following table every

pilot is characterized by a mark between 0 (worst) and 20 (best)

for his language skills (in English, French, Dutch, and Norwegian),

and for his experience with different two-seater aircraft

(reconnaissance, transport, bomber, fighterbomber, and supply

planes).

Ratings of pilots

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| |Pilot | 1| 2| 3| 4| 5| 6| 7| 8|

+----------+-------------------------+--+--+--+--+--+--+--+--+

|Language |English |20|14| 0|13| 0| 0| 8| 8|

| |French |12| 0| 0|10|15|20| 8| 9|

| |Dutch | 0|20|12| 0| 8|11|14|12|

| |Norwegian | 0| 0| 0| 0|17| 0| 0|16|

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|Plane type|Reconnaissance |18|12|15| 0| 0| 0| 8| 0|

| |Transport |10| 0| 9|14|15| 8|12|13|

| |Bomber | 0|17| 0|11|13|10| 0| 0|

| |Fighter-bomber | 0| 0|14| 0| 0|12|16| 0|

| |Supply plane | 0| 0| 0| 0|12|18| 0|18|

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**A valid flight crew consists of two pilots that both have each at**

**least 10/20 for the same language and 10/20 on the same aircraft**

**type**.

Question 1:

**Is it possible to have all pilots fly?**

Subsequently, we calculate for every valid flight crew the sum of

their scores for every aircraft type for which both pilots are

rated at least 10/20. This allows us to define for every crew the

maximum score among these marks. For example, pilots 5 and 6 have

marks 13 and 10 on bombers and 12 and 18 on supply planes. The

score for this crew is therefore max(13 + 10, 12 + 18) = 30. Question 2:

**Which is the set of crews with maximum total score?**