# Worksheet 5 Lists in functional programming

Here are two lists to use in the Tasks below

**placeList** = ["Ankara", "Baku", "Cairo", "Derby", **"Etna", "Faro"]**

**nameList = ["Anja", "Bjorn", "Cath", "Dirk", "Edna", "Figgis"]**

**Task 1**

1. (a) What is the **head** of **placeList**?

 (b) What is the **tail** of **nameList**?

2. (a) What is the **tail** of a list with just one element?

 (b) What is the **tail** of the **head** of **placeList**?

 (c) What is the **head** of the **tail** of **nameList?**

3. Use the idea that a string of characters is a list to map the first letters of each element in placeList to a new variable called capitals.

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### Task 2

**placeList** = ["Ankara", "Baku", "Cairo", "Derby", **"Etna", "Faro"]**

**nameList = ["Anja", "Bjorn", "Cath", "Dirk", "Edna", "Figgis"]**

Write Haskell code to achieve each part:

4. (a) Prepend the name “Aaron” to **nameList**

 (b) Append the place “Grimsby” to **placeList**

 (c) Define a new list called **newPlaces** where “Ankara” is replaced by “Athens”

 (d) Define a new integer countPlaces which has the value of the number of elements in newPlaces**.**

5. (a) Evaluate null ( tail [**"**fishpaste**"**])

 (b) Evaluate **null (tail placeList)**

6. Evaluate the following:

 (a) tail(tail(tail(placeList)))

 (b) head(tail(tail(nameList)))

 (c) numList = [3,5,7,9]

 null (tail(tail(tail(tail(numList)))))

7. Give the result and explain each stage of evaluating the following functional expression:

 foldl (+) 10 (map length ["Dave", "Sue", "Alice"])

Further reading: <https://www.futurelearn.com/courses/functional-programming-haskell>