

Complement of a subspace and adapted bases

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1 The Problem

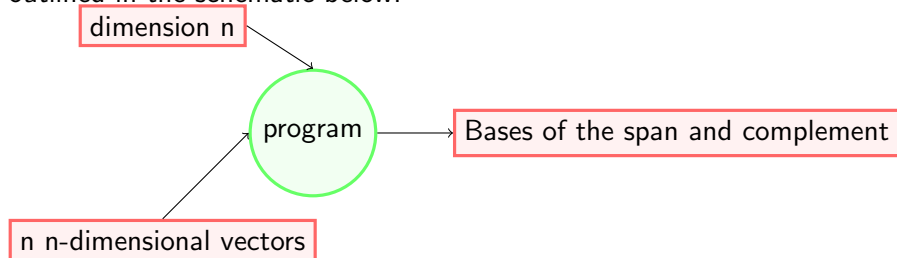
2 The math

- Basis of a subspace

3 The code

- `input()`
- `.append()`
- for-loops
- if-else statements

Our projects aim was to create a program fulfilling the purpose outlined in the schematic below.



The basis of a vectorspace is a minimal family of linearly independent vectors that spans the entire space.

If Ω is a vector space of dimension n with basis B_1 and $S \subseteq \Omega$ a subspace with basis B_2 then the basis of the complement $S^c \subseteq \Omega$ is given by

$$B_3 = B_1 \setminus B_2.$$

And therefore

$$B_1 = B_2 + B_3.$$

The *input()* function prompts the user to input a variable into the program.

$$n = \text{int}(\text{input}())$$

The *append()* function adds an object to another pre-existing object.

$$list_2 = list_1.append(x)$$

A for-loop is a function that repeatedly executes a piece of code using a list of values.

for i in list : function(i)

An *if*(*–else*) statement executes a piece of code contingent on a set of conditions being met. The *else* part of the statement provides code to be run if the *if*-condition is not met

if condition :

option 1

else :

option 2