MVA "Kernel methods"
Homework 5

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1. For any $n > 0$, show that the $n \times n$ Hankel matrix $A_{ij} = \frac{1}{1+i+j}$ is positive semidefinite.

2. Describe the functions $\phi : [0, 1] \mapsto \mathbb{R}$ such that:

$$K(x, y) = \phi \left(\max(x + y - 1, 0) \right)$$

is a positive definite kernel on $[0, 1]$.

3. Describe the functions $\phi : \mathbb{R}^+ \mapsto \mathbb{R}$ such that:

$$K(x, y) = \phi \left(\max(x, y) \right)$$

is a positive definite kernel on $\mathbb{R}^+$.