

Lösningar och kommentarer för tentamen 2025-08-19 i DA2005/DA2004

Del A: flervalsfrågor

1. A, B, D, E
2. D
3. A, C, D, E
4. E
5. B
6. A
7. E
8. D

Del B: kodfrågor

9. Exempellösning:

```
def ai_bot():
    user_input = ''
    while user_input != 'stop':
        user_input = input('You: ')
        if user_input == '':
            print('AI: Say something.')
        elif user_input != 'stop':
            print('AI: What?')
    print('AI: OK, thanks.')
```

10. Exempellösningar:

A. `def gc(dna):`
 `n_gc = 0`
 for nucleotide **in** dna:
 if nucleotide == 'G' **or** nucleotide == 'C':
 `n_gc += 1`
 return `n_gc / len(dna)`

B. `def gc(dna):`
 `n = 0`
 `n_gc = 0`
 for nucleotide **in** dna:
 if nucleotide == 'N':
 continue
 `n += 1`
 if nucleotide == 'G' **or** nucleotide == 'C':
 `n_gc += 1`
 return `n_gc / n`

C. `def gc(dna):`
 `n = 0`
 `n_gc = 0`
 for nucleotide **in** dna:
 if nucleotide == 'N':
 continue
 `n += 1`
 if nucleotide == 'G' **or** nucleotide == 'C':
 `n_gc += 1`
 assert `n > 0` # No A, C, G, or T in input
 return `n_gc / n`

11. Exempellösning:

```

def protein_weight(p):
    weight = 0
    for amino_acid in p:
        weight += amino_acid_weight[amino_acid]
    return weight

```

12. Exempellösning:

```

class AminoAcid:
    def __init__(self, name, abbrev, weight):
        self._name = name
        self._abbrev = abbrev
        self._weight = weight

molecule = AminoAcid('Alanine', 'A', 89.1)

```

13. Exempellösning:

```

def windowed_gc(dna, k):
    length = len(dna)
    result = []
    for i in range(length):
        start_position = max(0, i - k)
        end_position = min(i + k + 1, length + 1)
        window = dna[start_position : end_position]
        result.append(gcB(window))
    return result

```