| Last name | | | | |
|------------------|-------|---|---|-------|
| First name | [| 1 | | |
| Group | Grade | | | |
| Tutorial Teacher | Grade | | | |
| Algorithmia | | | 1 |] |

| Algorithmics |
|-----------------------------------------|
| Undergraduate 2^{nd} year - S3 |
| $Midterm \ \#3 \ (C3)$ |
| 9 November 2020 - 13 : 30 |
| Answer Sheets |

| 1 | |
|---|--|
| 2 | |
| 3 | |
| 4 | |
| 5 | |

Answers 1 (Some different results - 5 points)

Draw the hash tables corresponding to the different collision resolution methods:

| | 1. Coalesced hashing: | 2. I | inear probing: | 3. E | ouble hashing: |
|----|-----------------------|------|----------------|------|----------------|
| 0 | | 0 | | 0 | |
| 1 | | 1 | | 1 | |
| 2 | | 2 | | 2 | |
| 3 | | 3 | | 3 | |
| 4 | | 4 | | 4 | |
| 5 | | 5 | | 5 | |
| 6 | | 6 | | 6 | |
| 7 | | 7 | | 7 | |
| 8 | | 8 | | 8 | |
| 9 | | 9 | | 9 | |
| 10 | | 10 | | 10 | |
| | · | - | | | |

Answers 2 (Find the sum – 4 points)

Specifications:

The function find_sum(B, sum) tests if there exists a branch in the tree B (TreeAsBin) such that the sum of its values (integers) is equal to sum.

Answers 3 (Maximum Gap – 4 points)

Specifications: The function maxgap(B) computes the maximum gap of the B-tree B.

| | | | | | | | | | | | | |
|--|--|--|---|--|--|--|------|--|--|--|--|--|
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | 1 | | | | | | | | | |

Answers 4 (What? - 4 points)

1. Application results:

| what(B_3 , 2) | what(B_3 , 7) | what(B_3 , 18) | what(B_3 , 39) | what(B_3 , 41) | what(B_3 , 99) |
|------------------|------------------|-------------------|-------------------|-------------------|-------------------|
| | | | | | |

2. Let B be a non empty B-tree and x an integer. What does what (B, x) return?

Answers 5 (B-tree: insertion and deletion – 3 points)

1. Tree after the insertion of the value 39 (you can tilt the sheet and draw the tree in landscape format):

2. Tree after the deletion of the value 72 (you can tilt the sheet and draw the tree in landscape format):